Supplemental material

One-step estimator paths for concave regularization

7 Implementation via coordinate descent

We use Coordinate descent (CD; e.g., Luenberger and Ye, 2008) to minimize (3) at each step along the path. CD is a local optimization algorithm that cycles through minimization of the conditional objective for individual parameters when the remaining parameters are fixed. Algorithms of this type have have become popular in L_1 penalized estimation since the work by Friedman et al. (2007) and Wu and Lange (2008).

Our CD routine, outlined in Algorithm 1, is a solver for penalized weighted-least squares problems as defined in equation (21) below. This applies directly in Gaussian regression, and for non-Gaussian models we follow Friedman et al. (2010) and apply CD inside an outer loop of iteratively re-weighted-least-squares (IRLS; e.g., Green, 1984). Given current parameter values $\hat{\beta}$, the Newton-Raphson update for maximum likelihood estimation is $\beta = \hat{\beta} - \mathbf{H}^{-1}\mathbf{g}$, where \mathbf{H} is the information matrix with elements $h_{jk} = \partial^2 l/\partial \beta_j \partial \beta_k|_{\hat{\beta}}$ and \mathbf{g} is coefficient gradient (see Appendix 8). For exponential family linear models we can write $\mathbf{H} = \mathbf{X}'\mathbf{V}\mathbf{X}$ and $\mathbf{g} = \mathbf{X}'\mathbf{V}(\mathbf{z} - \hat{\boldsymbol{\eta}})$, where $\mathbf{V} = \mathrm{diag}(\mathbf{v})$, $\mathbf{v} = [v_1 \dots v_n]$ are 'weights', $\mathbf{z} = [z_1 \dots z_n]$ are transformed 'response', and $\hat{\eta}_i = \hat{\alpha} + \mathbf{x}_i \hat{\boldsymbol{\beta}}$. In Gaussian regression, $v_i = 1$, $z_i = \hat{\eta}_i - y_i$, and the update is an exact solution. For binomial regression, $v_i = q_i(1 - q_i)$ and $z_i = \hat{\eta}_i - (y_i - q_i)/v_i$, where $q_i = (1 + \exp[-\hat{\eta}_i])^{-1}$ is the estimated probability of success.

This yields $\beta = (\mathbf{X}'\mathbf{V}\mathbf{X})^{-1}\mathbf{X}'\mathbf{V}\mathbf{z}$, such that the Newton update solves a weighted-least-squares problem. Adding L_1 costs, the minimization objective from (3) becomes

$$\underset{\alpha,\beta_1...\beta_p \in \mathbb{R}}{\operatorname{argmin}} \sum_{i} \frac{v_i}{2} (\alpha + \mathbf{x}_i' \boldsymbol{\beta} - z_i)^2 + n \sum_{j} \omega_j \lambda |\beta_j|.$$
 (21)

Our solver iterates between CD on (21) and, for non-Gaussian models, updates to \mathbf{v} and \mathbf{z} . Each t^{th} segment IRLS routine initializes $[\hat{\alpha}, \hat{\boldsymbol{\beta}}]$ at solutions for λ^{t-1} , or at $[\hat{\alpha}, \mathbf{0}]$ for t = 1. In the gamlr implementation, a full pass update of all parameters is done only at the first CD iteration; otherwise coordinates with currently inactive (zero) $\hat{\beta}_j$ are not updated. Once the descent converges for this *active set*, IRLS \mathbf{v} and \mathbf{z} are updated and we begin a new CD loop

with a full pass update. The routine stops when maximum squared change in β_j scaled by its information over one of these full pass updates is less than some tolerance threshold, thresh. The default in gamlr uses a relative tolerance of 10^{-7} times null model deviance.

Algorithm 1 Coordinate descent

Set
$$\operatorname{vh}_{\mathtt{j}} = \sum_{i} v_{i} (x_{ij} - \bar{x}_{j})^{2}$$
 and $\operatorname{vx}_{\mathtt{j}} = \sum_{i} v_{i} x_{ij}$ for $j = 1 \dots p$. while $\max_{j=1\dots p} \operatorname{vh}_{\mathtt{j}} \Delta_{j}^{2} > \operatorname{thresh}$: for $\mathtt{j} = 1 \dots p$:
$$\operatorname{set} \operatorname{vg}_{\mathtt{j}} = -\sum_{i} x_{ij} v_{i} (z_{i} - \hat{\eta}_{i}) \text{ and } \operatorname{ghb} = \operatorname{vg}_{\mathtt{j}} - \operatorname{vh}_{\mathtt{j}} \hat{\beta}_{j}$$

$$\operatorname{if} |\operatorname{ghb}| < n \lambda^{t} \omega_{j}^{t} \colon \ \Delta_{j} = -\hat{\beta}_{j}$$

$$\operatorname{else} \colon \ \Delta_{j} = -(\operatorname{vg}_{\mathtt{j}} - \operatorname{sign}(\operatorname{ghb}) n \lambda^{t} \omega_{j}^{t}) / \operatorname{vh}_{\mathtt{j}}.$$

$$\operatorname{update} \ \hat{\beta}_{j} \stackrel{\pm}{=} \Delta_{j}, \ \hat{\alpha} \stackrel{\pm}{=} -\operatorname{vx}_{\mathtt{j}} \Delta_{j}, \ \operatorname{and} \ \hat{\boldsymbol{\eta}} = \hat{\alpha} + \mathbf{X}' \hat{\boldsymbol{\beta}}.$$

7.1 Descent convergence

Despite the non-differentiability of $|\beta_j|$ at zero, Tseng (2001) establishes local convergence for CD on (21) as a consequence of penalty separability: the non-differentiable part of our objective is a sum of functions on only a single coordinate. Thus CD solves each weighted-least squares problem, and the full algorithm converges if IRLS does. For non-Gaussian models, convergence of such nested L_1 -penalized IRLS algorithms is shown in Lee et al. (2014).

7.2 Quasi-Newton acceleration

Under high collinearity and large γ , one may wish to accelerate convergence via a quasi-Newton step (e.g., Lange, 2010). Acceleration is applied to $\boldsymbol{\theta} = [\alpha, \beta]$, and a move is accepted only if it leads to a decrease in the objective. Suppose that $\hat{\boldsymbol{\theta}}^{(0)}$, $\hat{\boldsymbol{\theta}}^{(-1)}$, and $\hat{\boldsymbol{\theta}}^{(-2)}$ are the current, previous, and previous-to-previous parameter estimates. Write $M(\hat{\boldsymbol{\theta}}^{(t)})$ as the implied CD update map $\hat{\boldsymbol{\theta}}^{(t)} \to \hat{\boldsymbol{\theta}}^{(t+1)}$, such that the algorithm converges at $\hat{\boldsymbol{\theta}} - M(\hat{\boldsymbol{\theta}}) = \mathbf{0}$. With $\mathbf{u} = \hat{\boldsymbol{\theta}}^{(-1)} - \hat{\boldsymbol{\theta}}^{(-2)}$ and $\mathbf{v} = \hat{\boldsymbol{\theta}}^{(0)} - \hat{\boldsymbol{\theta}}^{(-1)}$, a secant approximation to the gradient of M is $\partial M/\partial \hat{\theta}_l \approx \mathbf{v}_l/\mathbf{u}_l$. An approximate Newton-Raphson step to solve for the root of $\hat{\boldsymbol{\theta}} - M(\hat{\boldsymbol{\theta}})$ updates each coordinate $\hat{\theta}_l \leftarrow \hat{\theta}_l^{(-1)} - (\hat{\theta}_l^{(-1)} - \hat{\theta}_l^{(0)})/(1 - \mathbf{v}_l/\mathbf{u}_l)$ which can be re-written as $\hat{\theta}_l = (1 - \mathbf{w}_l)\hat{\theta}_l^{(-1)} + \mathbf{w}_l\hat{\theta}_l^{(0)}$ where $\mathbf{w}_l = \mathbf{u}_l/(\mathbf{u}_l - \mathbf{v}_l)$.

8 Gradient, curvature, and path starts

The negative log likelihood objective in Gaussian regression is $l(\alpha, \beta) = 0.5 \sum_i (y_i - \eta_i)^2$ with gradient $g_j(\beta) = \partial l/\partial \beta_j = -\sum_i x_{ij} (y_i - \eta_i)$, and coordinate curvature $h_j(\beta) = \partial^2 l/\partial \beta_j^2 = \sum_i x_{ij}^2$. In logistic regression, set $y_i = 1$ for 'success' and $y_i = 0$ for 'failure' and write $q_i = (1 + \exp[-\eta_i])^{-1}$ as the probability of success. Then $l(\alpha, \beta) = \sum_i -y_i \eta_i + \log(1 + \exp[\eta_i])$, $g_j(\beta) = \partial l/\partial \beta_j = -\sum_i x_{ij} (y_i - q_i)$, and $h_j(\beta) = \partial^2 l/\partial \beta_j^2 = \sum_i x_{ij}^2 q_i (1 - q_i)$. In each case, it is implied that $\hat{\alpha}$ has been set to minimize $l(\alpha, \hat{\beta})$.

For L_1 costs $c_j(|\beta_j|) = |\beta_j|$, the infimum λ such that $\hat{\beta} = 0$ is available analytically as $\lambda^1 = n^{-1} \max\{|g_j(\mathbf{0})|, j = 1 \dots p\}$, the maximum mean absolute gradient for the null model with $\beta = 0$. This formula is used to obtain our starting values for the path algorithms.

9 False Discovery Control

A common goal in high-dimensional estimation is support recovery – having the set $\{j : \hat{\beta}_j \neq 0\}$ of some 'true' β . For standard lasso estimated $\hat{\beta}$, many authors have shown (e.g., Buhlmann and van de Geer, 2011; Zou, 2006) that to get exact support recovery asymptotically or with high probability requires an *irrepresentability condition* which limits the size of least-squares projections from 'true support' onto spurious covariates.

DEFINITION 9.1. The (θ, S, \mathbf{v}) -irrepresentable condition for $\theta \in [0, 1]$ and $\mathbf{v} \in \mathbb{R}^s$ holds that,

$$|\mathbf{x}_{j}'\mathbf{X}_{S}(\mathbf{X}_{S}'\mathbf{X}_{S})^{-1}\mathbf{v}| \leq \theta \ \forall j \notin S$$
 (22)

This is often presented with $\mathbf{v}=\mathbf{1}$. It can be a strict design restriction; for example, Buhlmann and van de Geer (2011) show a single variable that is highly correlated with many columns of \mathbf{X}_S leading to failure. Much of the literature on concave penalization has focused on achieving support recovery *without* such conditions; see, e.g., Fan et al. (2014) for a recent overview. Our results will require irrepresentable conditions with $\mathbf{v}=\boldsymbol{\omega}_S$, which becomes less restrictive as one is able to shrink weights ω_j for $j \in S$. See the remarks for more discussion.

Our comparison of interest is between $\hat{S} = \{j : \hat{\beta}_j \neq 0\}$, for $\hat{\beta}$ from weighted- L_1 penalized estimation, and $S = \{j : \beta_j^{\nu} \neq 0\}$ for β^{ν} the L_0 penalized estimator from Theorem 3.1. Whether looking to an L_0 oracle or a sparse truth, our experience is that exact support recovery does not occur in practice (e.g., see the simulation in Section 5). Thus, we instead focus on ability of the weighted-lasso to minimize false discoveries: $\hat{\beta}_j \neq 0$ when $\beta_j^{\nu} = 0$.

¹Wainwright (2009) shows that (22) with $\theta = 1$, $\mathbf{v} = \mathbf{1}$ is necessary for lasso sign recovery in the *noiseless* setting.

THEOREM 9.1. Consider the setting of Theorem 3.1. If $\omega_{S^c}^{\min} = 1$ and $\lambda > \sqrt{2\nu}$ then

$$\|\mathbf{X}_{S^c}'\mathbf{X}_S(\mathbf{X}_S'\mathbf{X}_S)^{-1}\boldsymbol{\omega}_S\|_{\infty} \le 1 - \frac{\sqrt{2\nu}}{\lambda_t} \implies \hat{S} \cap S^c = \varnothing.$$
 (23)

The result follows directly from the sign recovery lemma 9.1.

Remarks

- From Theorem 7.4 in Buhlmann and van de Geer (2011), the irrepresentability condition holds with $|x_j' \mathbf{X}_S(\mathbf{X}_S' \mathbf{X}_S)^{-1} \boldsymbol{\omega}_S| \leq \frac{\|\boldsymbol{\omega}_S\|}{\sqrt{s}} \theta_{\mathrm{adap}}(S)$ where $\theta_{\mathrm{adap}}(S)$ is their 'adaptive restricted regression' coefficient. Of interest here, they show that $\theta_{\mathrm{adap}}(S) \leq \sqrt{s}/\Lambda_{\min}(S)$ where $\Lambda_{\min}(S)$ is the minimum eigenvalue of $\mathbf{X}_S' \mathbf{X}_S/n$. Thus, (i) can be replaced by the restriction $\Lambda_{\min}(S) \geq \|\boldsymbol{\omega}_S\| (1 \sqrt{2\nu}/(\omega_{S^c}^{\min}\lambda))^{-1} = \sqrt{s}L$, with L from Theorem 3.1, and small values for L appear key in both predictive performance and support recovery.
- Without irrepresentability, limits on false discovery are more pessimistic. Convergence conditions imply that for $j \in S^c \cap \hat{S}$ we have $n\lambda\omega_j = |x_j'(\mathbf{X}\hat{\boldsymbol{\beta}} \mathbf{y})| \leq |x_j'\mathbf{X}(\hat{\boldsymbol{\beta}} \boldsymbol{\beta}^{\nu})| + |x_j'\mathbf{e}^S| \leq n\left(2\|\boldsymbol{\omega}_S\|/\phi(L,S) + \sqrt{2\nu}/\lambda\right) \ \forall \ j.$ Dividing by $n\lambda\omega_j$ and counting yields

$$|S^c \cap \hat{S}| \le \left| \frac{1}{\boldsymbol{\omega}_{S^c \cap \hat{S}}} \right| \left(\frac{2\|\omega_S\|}{\phi(L, S)} + \frac{\sqrt{2\nu}}{\lambda} \right)$$
 (24)

Without the ability to make ω_j very big for $j \in S^c$ (e.g., as in a thresholding procedure like that of Zhou 2009), the result in (24) has little to say about false discovery control.

9.1 Sign Recovery

LEMMA 9.1. Under the setting of Theorem 3.1, with $\hat{S} = \{j : \hat{\beta}_j \neq 0\}$, if $\omega_{S^c}^{\min} \lambda > \sqrt{2\nu}$ then

$$|\boldsymbol{x}_{j}'\mathbf{X}_{S}(\mathbf{X}_{S}'\mathbf{X}_{S})^{-1}\boldsymbol{\omega}_{S}| \leq 1 - \frac{\sqrt{2\nu}}{\lambda\omega_{j}} \ \forall j \in S^{c} \Rightarrow \hat{S} \cap S^{c} = \varnothing.$$
 (25)

If in addition $|(\mathbf{X}_S'\mathbf{X}_S)^{-1}\mathbf{X}_S'\mathbf{y}|_{\infty} > n\lambda |(\mathbf{X}_S'\mathbf{X}_S)^{-1}\boldsymbol{\omega}_S|_{\infty}$, then $\mathrm{sgn}(\hat{\boldsymbol{\beta}}) = \mathrm{sgn}(\boldsymbol{\beta}^{\nu})$.

Proof. The Karush-Kuhn-Tucker (KKT) conditions at weighted- L_1 minimization convergence imply that

$$\mathbf{x}_{j}'\mathbf{X}(\hat{\boldsymbol{\beta}} - \boldsymbol{\beta}^{\nu}) + \mathbf{x}_{j}'\mathbf{e}^{S} = -n\lambda\zeta_{j} \text{ for } j = 1\dots p$$
 (26)

where $|\zeta_j| = \omega_j$ for $j \in \hat{S}$ and $|\zeta_j| \leq \omega_j$ for $j \in \hat{S}^c$. Following closely related proofs in Wainwright (2006, 2009); Zhou et al. (2009), $\hat{S} \cap S^c = \emptyset$ occurs if and only if these KKT

conditions hold for projections restricted to S,

$$\mathbf{X}_{S}'\mathbf{X}_{S}(\hat{\boldsymbol{\beta}}_{S} - \boldsymbol{\beta}_{S}^{\nu}) + \mathbf{X}_{S}'\mathbf{e}^{S} = -n\lambda\boldsymbol{\zeta}_{S} \implies \hat{\boldsymbol{\beta}}_{S} - \boldsymbol{\beta}_{S}^{\nu} = -n\lambda(\mathbf{X}_{S}'\mathbf{X}_{S})^{-1}\boldsymbol{\zeta}_{S}. \tag{27}$$

Thus all of the spurious regressors in S^c will have $\hat{\beta}_j = 0$ if and only if

$$\boldsymbol{x}_{j}^{\prime}\mathbf{X}_{S}(\hat{\boldsymbol{\beta}}_{S}-\boldsymbol{\beta}_{S}^{\nu})-\boldsymbol{x}_{j}^{\prime}\mathbf{e}^{S}\leq n\lambda\zeta_{j} \iff 1-\frac{|x_{j}^{\prime}\mathbf{e}^{S}|}{n}\geq1-\frac{\sqrt{2\nu}}{\lambda\omega_{j}}\geq|\boldsymbol{x}_{j}^{\prime}\mathbf{X}_{S}(\mathbf{X}_{S}^{\prime}\mathbf{X}_{S})^{-1}\boldsymbol{\omega}_{S}|. (28)$$

Finally, for sign recovery on $j \in S$ we need $|\beta_j^{\nu}| - |\beta_j^{\nu} - \hat{\beta}_j| > 0 \ \forall j \in S$, and our stated condition follows from $\beta^{\nu}_S = (\mathbf{X}_S' \mathbf{X}_S)^{-1} \mathbf{X}_S' \mathbf{y}$ and $\beta^{\nu}_S - \hat{\beta}_S = n\lambda (\mathbf{X}_S' \mathbf{X}_S)^{-1} \boldsymbol{\zeta}_S$.

10 Extra proofs

10.1 Stagewise Regression

Theorem 3.1 uses the following simple result for stagewise regression – iterative fitting of new covariates to the residuals of an existing linear model (as in, e.g., Goldberger 1961).

LEMMA 10.1. Say $MSE_S = \|\mathbf{X}\boldsymbol{\beta}^S - \mathbf{y}\|^2/n$ and $cov(\boldsymbol{x}_j, \mathbf{e}^S) = \boldsymbol{x}_j'(\mathbf{y} - \mathbf{X}\boldsymbol{\beta}^S)/n$ are sample variance and covariances. Then for any $j \in 1 ... p$,

$$cov^{2}(\boldsymbol{x}_{j}, \mathbf{e}^{S}) \leq MSE_{S} - MSE_{S \cup j}$$

Proof. From the well-known property on the correlation coefficient (R^2) for linear models, in-sample correlation and variances are such that

$$\frac{\operatorname{cov}^{2}(\boldsymbol{x}_{j}, \mathbf{e}^{S})}{\operatorname{var}(\boldsymbol{x}_{j})\operatorname{var}(\mathbf{e}^{S})} = 1 - \frac{\operatorname{var}(\mathbf{e}^{S} - \tilde{\beta}_{j}\boldsymbol{x}_{j})}{\operatorname{var}(\mathbf{e}^{S})}$$

where $\tilde{\beta}_j = \boldsymbol{x}_j' \mathbf{e}^S/(\boldsymbol{x}_j' \boldsymbol{x}_j)$ is the stagewise coefficient estimate. Since $\operatorname{var}(\boldsymbol{x}_j) = 1$, multiplying everything by $\operatorname{var}(\mathbf{e}^S)$ yields $\operatorname{cov}^2(\boldsymbol{x}_j, \mathbf{e}^S) = \operatorname{var}(\mathbf{e}^S) - \operatorname{var}(\mathbf{e}^S - \tilde{\beta}_j \boldsymbol{x}_j) \leq \operatorname{var}(\mathbf{e}^S) - \operatorname{var}(\mathbf{e}^{S \cup j})$. The last inequality holds because $\mathbf{e}^{S \cup j}$, residuals from OLS on $\mathbf{X}_{S \cup j}$, have the smallest-possible sum of squares for that set of covariates. With $\operatorname{var}(\mathbf{e}^S) = \operatorname{MSE}_S$, etc, we are done.

10.2 Bayesian MAP

PROPOSITION 10.1. $\hat{\beta}$ solves (14) if and only if it is also in the solution to (13).

Proof. The conditional posterior mode for each τ_j given β_j is $\tau(\beta_j) = \gamma s/(1 + \gamma |\beta_j|)$. Any joint solution $[\hat{\beta}, \hat{\tau}]$ for (13) thus consists of $\hat{\tau}_j = \tau(\hat{\beta}_j)$; otherwise, it is always possible to decrease the objective by replacing $\hat{\tau}_j$. Setting each $\tau_j = \tau(\beta_j)$ in (13) and removing constant terms yields (14). Moreover, the solution to (13) solves (14): otherwise, there would need to be a point on the profile slice of (13) defined by $\tau_j = \tau(\hat{\beta}_j)$ that is lower than its minimum.

For a Bayesian it is odd to be solving for τ rather than marginalizing over its uncertainty. However, recognizing the form of a gamma density in (12), $\pi(\beta_j, \tau_j)$ integrates over τ_j to yield the marginal prior $\pi(\beta_j) = 0.5s \left(1 + \gamma |\beta_j|\right)^{-(s+1)}$. This is the generalized double Pareto density, as in Armagan et al. (2013). Since $-\log \pi(\beta_j) \propto (s+1)\log(1+\gamma|\beta_j|)$, the *profile* MAP solution to (13) is also the *marginal* MAP for β under $\operatorname{Ga}(s-1,1/\gamma)$ priors on each τ_j .

11 Stability

A strong form of stability comes from convexity of the penalized objective in (1). This requires that the minimum eigenvalue of $\mathbf{H}(\boldsymbol{\beta})$, the Hessian matrix of second derivatives of $l(\boldsymbol{\beta})$, is greater than $|c''(\beta_j)| \, \forall j$. For penalized least-squares under log costs, this amounts to requiring that the minimum eigenvalue of $\mathbf{H} = \mathbf{X}'\mathbf{X}$ is greater than $\lambda \gamma^2$. In the simple *standardized* orthogonal covariate case, this has an easy interpretation in the context of our Bayesian model from Section 4.1: for Gaussian regression, $h_j = \sum_i x_{ij}^2 = n$ and the objective is convex if prior variance on each τ_j is less than the number of observations. For logistic regression you need $\operatorname{var}(\tau_j) < n/4$, since \mathbf{H} now depends upon the coefficient values.

In real examples, however, we cannot rely upon objective convexity. A more useful definition of stability requires continuity of the implied coefficient function, $\hat{\beta}(\mathbf{y})$, in an imagined univariate regression problem (or for orthogonal covariates). This is one of the key requirements of concave penalties listed by Fan and Li (2001). Many popular concave cost functions, such as the SCAD and MCP, have been engineered to have this continuity property. Conveniently, Zou and Li (2008) show that OSE LLA solutions have this property even if the target objective does not. For example, even though the log penalty *does not* generally lead to continuous thresholding, their result implies that the GL solutions are continuous for $\gamma < \infty$.

A theoretically richer form of stability is Lipschitz continuity of the implied prediction function, $\hat{\boldsymbol{y}} = \mathbf{X}\hat{\boldsymbol{\beta}}(\mathbf{y})$, which requires that $\|\hat{\mathbf{y}}(\mathbf{y}_1) - \hat{\mathbf{y}}(\mathbf{y}_2)\| \leq L\|\mathbf{y}_1 - \mathbf{y}_2\|$ for some finite constant L on all possible $\mathbf{y}_1, \mathbf{y}_2$. Zou et al. (2007) establish Lipschitz continuity for L_1 estimated

If ν is an eigenvalue of \mathbf{H} , then $(\mathbf{H} - \nu \mathbf{I})\mathbf{v} = 0$ for some nonzero \mathbf{v} ; the negative log posterior Hessian at zero is $\mathbf{H} - \lambda \gamma^2 \mathbf{I}$ and $(\mathbf{H} - \lambda \gamma^2 \mathbf{I} + s \gamma^2 \mathbf{I} - \nu \mathbf{I})\mathbf{v} = 0$ so that $\nu - s \gamma^2$ is an eigenvalue of the minimization objective.

predictors as part of their derivation of a degrees-of-freedom estimator. Thus, conditional upon values for the coefficient-specific weights, POSE and GL are trivially Lipschitz continuous. Unconditionally, we do not believe that the paths have this guarantee. However, we'll see in the next section that a heuristic degrees-of-freedom estimator that takes such stability for granted performs well as the basis for model selection.

Finally, the basic and most important type of stability is practical path continuity: by this, we mean that solutions change slowly enough along the path so that computational costs are kept within budget. A regularization path can be built from a continuous thresholding function, or perhaps even be Lipschitz stable, but none of that matters if it takes too long to fit. For example, Figure 4 shows timings growing rapidly with large γ for the hockey data of Section 6, even though all of these specifications are theoretically stable by some criteria.

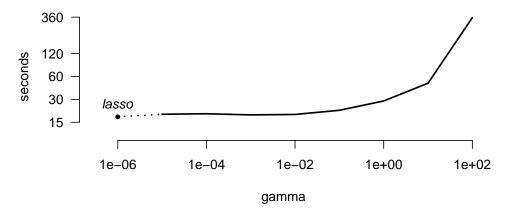


Figure 4: Timings for the hockey data path fits of Section 6 on a length-100 grid with $\lambda^{100}=0.01\lambda^1$.

12 Information Criteria

We would like to choose a model that performs well in predicting new data. 'Good prediction' can be measured in a variety of ways. A common and coherent framework is to consider minimizing Kullback-Leibler (KL) divergence. Say $g(\mathbf{y})$ is the true data generating process, and $f(\mathbf{y}; \boldsymbol{\eta}, \phi)$ is the parametric density under study, which we suppose here is a natural exponential family with $\mathbb{E}[\mathbf{y}] = \boldsymbol{\eta}$ and dispersion ϕ . Then we wish to minimize

$$KL(\boldsymbol{\eta}, \phi) = \mathbb{E}_g \log g(\mathbf{y}) - \mathbb{E}_g \log f(\mathbf{y}; \boldsymbol{\eta}, \phi), \tag{29}$$

the expected difference between log true density and our parametric approximation. Since $\mathbb{E}_g \log g(\mathbf{y})$ is constant, this leads one to minimize $Q(\boldsymbol{\eta}, \phi) = -\mathbb{E}_g \log f(\mathbf{y}; \boldsymbol{\eta}, \phi)$, the expected

negative log likelihood. There is no requirement that g is a member of the family defined by f.

If parameters are to be estimated as $[\eta_y, \phi_y]$, functions of random sample $y \sim g$, then $Q(\eta_y, \phi_y)$ is itself a random variable and one chooses estimators to minimize its expectation. Crucially, we imagine a double-sample expectation, where the minimization objective is

$$\mathbb{E}_{\mathbf{y}|g}\mathbb{E}_{\tilde{\mathbf{y}}|g}\log f(\tilde{\mathbf{y}};\boldsymbol{\eta}_{\mathbf{y}},\phi_{\mathbf{y}}). \tag{30}$$

The notation here indicates that inner and outer expectations are based on two *independent* random samples from g: \mathbf{y} for training, upon which $\eta_{\mathbf{y}}$, $\phi_{\mathbf{y}}$ are calculated, and $\tilde{\mathbf{y}}$ for validation.

Information criteria (IC) are analytic approximations to metrics like (30).³ They take the form

$$-2\log f(\mathbf{y}; \boldsymbol{\eta}_{\mathbf{v}}, \phi_{\mathbf{v}}) + c(df) \tag{31}$$

where c(df) is cost of the *degrees-of-freedom* used in $\eta_{\mathbf{y}}$ – e.g., for $\mathbf{y} \sim (\eta, \sigma^2 \mathbf{I})$, Efron et al. (2004) defines $df = \sigma^{-2} \sum_i \operatorname{cov}(\eta_{\mathbf{y}i}, y_i)$.

Consider a Gaussian regression model where η_y is an estimate for $\eta = \mathbb{E}y$ using df degrees of freedom, and set $\phi_y = \sigma_y^2 = \sum_i (y_i - \eta_{yi})^2 / n$. We'll derive

$$df \frac{n}{n - df - 1} \approx \mathbb{E}_{\mathbf{y}|g} \left[\log f(\mathbf{y}; \boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}}) - \mathbb{E}_{\tilde{\mathbf{y}}|g} \log f(\tilde{\mathbf{y}}; \boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}}) \right], \tag{32}$$

such that AICc's complexity penalty is the expected bias that results from taking the fitted log likelihood as an estimate for (30). First, by cancellation the inner term of (32) simplifies as

$$\log f(\mathbf{y}; \boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}}) - \mathbb{E}_{\tilde{\mathbf{y}}|g} \log f(\tilde{\mathbf{y}}; \boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}}) = \frac{\mathbb{E}_{\tilde{\mathbf{y}}|g} \sum_{i} (\tilde{y}_{i} - \eta_{\mathbf{y}i})^{2}}{2\sigma_{\mathbf{y}}^{2}} - \frac{n}{2}.$$
 (33)

Now, assume that the *true* model is linear and that the data were generated from $\mathbf{y} \sim g(\boldsymbol{\eta}, \sigma^2 \mathbf{I})$. The Mallows (1973) C_p formula holds that $n\sigma_{\mathbf{y}}^2 + 2\sigma^2 df$ is an unbiased estimator for expected sum of square errors $\mathbb{E}_{\tilde{\mathbf{y}}|g} \sum_i (\tilde{y}_i - \eta_{\mathbf{y}i})^2 / n$, such that

$$\frac{\mathbb{E}_{\tilde{\mathbf{y}}|g} \sum_{i} (\tilde{y}_{i} - \eta_{\mathbf{y}i})^{2}}{2\sigma_{\mathbf{y}}^{2}} - \frac{n}{2} \approx \frac{n\sigma_{\mathbf{y}}^{2} + 2\sigma^{2}df}{2\sigma_{\mathbf{y}}^{2}} - \frac{n}{2} = df \frac{\sigma^{2}}{\sigma_{\mathbf{y}}^{2}}.$$
 (34)

At this point, we see that the standard AIC approximation results from equating $\sigma^2 \approx \mathbb{E}_{\mathbf{y}|g} \sigma_{\mathbf{y}}^2$, so that $df \mathbb{E}_{\mathbf{y}|g} [\sigma^2/\sigma_{\mathbf{y}}^2] \approx df$. This will underpenalize complexity whenever residual variance

³Not all IC target (30). For example, the 'Bayesian' BIC, with $c(df) = \log(n)df$ (Schwarz, 1978), is derived (Kass and Raftery, 1995) as Laplace approximation to the negative log of the *marginal likelihood*. We include the BIC as a comparator to AIC and AICc in our examples.

 $\sigma^2_{\mathbf{y}}$ tends to be smaller than the true variance σ^2 – that is, whenever the model is overfit. In contrast, AICc applies the chi-squared goodness of fit result $n\sigma^2_{\mathbf{y}}/\sigma^2 \sim \chi^2_{n-df-1}$ to obtain

$$\mathbb{E}_{\mathbf{y}|g}\left[\frac{\sigma^2}{\sigma_{\mathbf{y}}^2}df\right] = n\mathbb{E}_{\mathbf{y}|g}\left[\frac{1}{n\sigma_{\mathbf{y}}^2/\sigma^2}\right]df = \frac{n}{n - df - 1}df.$$
 (35)

Multiplying by -2 and subtracting from $-2 \log f(\mathbf{y}; \boldsymbol{\eta}_{\mathbf{y}}, \sigma_{\mathbf{y}})$ yields the AICc.

13 Full simulation results

Continuous-response data are simulated from a p = 1000 dimensional linear model

$$y \sim N\left(\mathbf{x}'\boldsymbol{\beta}, \sigma^2\right) \text{ where } \beta_j = (-1)^j \exp\left(-\frac{j}{\mathsf{d}}\right) \mathbb{1}_{[j \le J]} \text{ for } j = 1 \dots p$$
 (36)

We consider sample sizes of n=100 and n=1000. For our *dense* simulation models, J=p so that all true coefficients are nonzero. For our *sparse* simulation models, J=n/10. With $\mathbf{z}_i \sim \mathrm{N}\left(\mathbf{0}, \mathbf{\Sigma}\right)$ for $i=1\dots n$, the regression inputs \mathbf{x}_i are generated as either *continuous* $x_{ij}=z_{ij}$ or binary $x_{ij} \stackrel{ind}{\sim} \mathrm{Bern}\left(1/(1+e^{-z_{ij}})\right)$.

Each simulation draws n means $\eta_i = \mathbf{x}_i'\boldsymbol{\beta}$, and two independent response samples $\mathbf{y}, \tilde{\mathbf{y}} \sim \mathrm{N}(\boldsymbol{\eta}, \sigma^2 \mathbf{I})$. Residual variance σ^2 and covariate correlation $\boldsymbol{\Sigma}$ are adjusted across runs. In the first case, we define σ^2 through *signal-to-noise* ratios $\mathrm{sd}(\boldsymbol{\eta})/\sigma$ of 1/2, 1, and 2. In the latter case, multicollinearity is parametrized via $\Sigma_{jk} = \rho^{|j-k|}$, and we consider $\rho = 0, 0.5$, and 0.9. Finally, the coefficient decay rate d controls the effective sparsity: how much $\boldsymbol{\beta}$ is *measurably* different from zero. See Figure 5 for illustration; we consider d of 10, 50, 100, and 200.

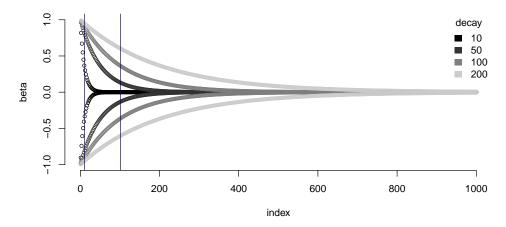


Figure 5: The linear model coefficients for our simulation in 36. Vertical lines mark thresholding points for the *sparse* model simulations, at J = 10 for n = 100 and at J = 100 for n = 1000.

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Table 3: Predictive \mathbb{R}^2 for 100 observations, binary design with dense covariates. Reported as % worse than the Oracle – MLE fit on the C_p optimal covariates – across 1000 samples.

			% Worse than Oracle lasso GL $\gamma=1$ GL $\gamma=10$ marginal AL									
1/)/	.1								margii		Man	0 1 02
$sd(\boldsymbol{\eta})/\sigma$	d	ρ	AICc	CV	AICc	CV	AICc	CV	AICc	CV	MCP	Oracle R^2
		0	35	22	30	26	17	47	19	14	25	0.73
	10	0.5	40	28	34	31	17	51	21	14	29	0.73
		0.9	43	30	38	34	17	55	23	15	32	0.73
		0	75	68	13	88	6	96	33	4	66	0.63
2	50	0.5	76	71	16	90	6	97	33	4	71	0.63
		0.9	78	73	21	90	6	96	36	5	74	0.63
		0	79	73	-1	94	0	97	32	-1	72	0.59
	100	0.5	79	75	0	94	0	98	33	-1	76	0.60
		0.9	80	76	2	94	0	98	35	-1	76	0.60
		0	80	75	-3	96	-1	98	32	-3	73	0.59
	200	0.5	81	79	-3	96	-1	98	34	-3	78	0.59
		0.9	80	79	-2	96	-1	98	35	-2	78	0.59
		0	63	63	64	74	101	90	41	79	65	0.37
	10	0.5	65	66	67	76	99	91	43	79	69	0.37
		0.9	67	68	69	77	98	90	45	78	70	0.37
		0	70	72	62	97	108	103	21	75	75	0.20
1	50	0.5	72	78	59	98	106	104	22	74	81	0.20
		0.9	75	79	61	97	106	102	27	72	80	0.20
		0	57	60	65	102	117	107	-29	59	62	0.12
	100	0.5	63	69	60	102	113	107	-23	57	73	0.12
		0.9	59	64	58	100	113	106	-23	53	65	0.12
		0	7	13	50	109	141	117	-201	7	15	0.05
	200	0.5	18	32	45	108	126	116	-164	7	42	0.06
		0.9	3	16	44	104	130	114	-184	-8	24	0.05
		0	115	142	720	149	1483	152	281	1198	161	0.04
	10	0.5	116	141	633	149	1450	151	287	1186	158	0.05
		0.9	114	147	623	148	1471	152	295	1171	156	0.04
		0	-74	-56	969	-53	1162	-49	81	915	-49	-0.05
0.5	50	0.5	-73	-56	972	-53	1183	-52	72	920	-47	-0.05
		0.9	-81	-53	979	-56	1206	-51	82	909	-47	-0.05
		0	-81	-66	827	-63	929	-61	47	724	-56	-0.06
	100	0.5	-80	-64	824	-60	939	-61	46	730	-57	-0.06
		0.9	-85	-68	822	-63	945	-62	49	707	-61	-0.06
		0	-80	-65	843	-62	907	-60	43	706	-57	-0.06
	200	0.5	-80	-65	854	-62	926	-62	42	716	-58	-0.06
		0.9	-86	-71	822	-66	896	-65	44	670	-61	-0.06

Table 4: Predictive \mathbb{R}^2 for 100 observations, continuous design with dense covariates. Reported as % worse than the Oracle – MLE fit on the C_p optimal covariates – across 1000 samples.

			% Worse than Oracle lasso ${\rm GL} \ \gamma = 1 \qquad {\rm GL} \ \gamma = 10 \qquad {\rm marginal} \ {\rm AL}$									
$\mathrm{sd}(oldsymbol{\eta})/\sigma$	d	ho	lass AICc	so CV	$\operatorname{GL} \gamma$	= 1 CV	$\operatorname{GL} \gamma$	= 10 CV	margir <i>AICc</i>	nal AL CV	MCP	Oracle R^2
, .		0	35	24	46	28	18	48	19	13	26	0.73
	10	0.5	66	64	81	65	29	73	39	18	57	0.74
		0.9	40	41	47	41	44	41	23	18	40	0.74
		0	74	68	61	89	6	96	31	4	68	0.63
2	50	0.5	83	85	96	93	6	98	43	7	85	0.64
		0.9	71	75	90	76	51	83	48	36	74	0.64
		0	78	72	22	94	0	97	31	-2	73	0.59
	100	0.5	85	86	85	95	0	99	40	1	86	0.59
		0.9	79	84	97	87	9	94	50	35	84	0.60
	• • •	0	80	75	2	96	-1	98	32	-3	76	0.59
	200	0.5	84	87	53	96	-1	99	39	0	86	0.59
		0.9	84	88	99	92	-1	98	53	36	88	0.59
	10	0 0.5	61 76	64 79	87 92	73 82	100 95	88	40 53	78 77	64	0.37 0.37
	10	0.9	40	79 42	92 49	82 40	42	90 37	33	38	78 35	0.37
_		0	70	74	77	96	105	102	20	73	74	0.20
1	50	0.5	80	87	97	96	104	104	32	67	85	0.20
		0.9	68	76	95	78	93	92	40	36	75	0.22
		0	56	64	63	100	112	107	-29	54	66	0.12
	100	0.5	67	77	79	98	110	107	-14	42	78	0.12
		0.9	68	79	102	87	99	101	17	8	79	0.13
		0	9	27	53	104	132	115	-184	1	27	0.05
	200	0.5	31	49	26	104	125	116	-146	-33	51	0.05
		0.9	42	67	108	87	111	109	-62	-85	69	0.06
		0	106	135	282	137	1311	146	242	1054	141	0.05
	10	0.5	114	127	131	127	1220	139	249	924	137	0.05
		0.9	66	79	90	77	560	93	125	233	79	0.08
0 -	. .	0	-81	-56	962	-55	1224	-51	74	956	-41	-0.05
0.5	50	0.5	-77	-56	396	-54	1288	-49	86	881	-51	-0.04
		0.9	-68	-41	-36	-28	2652	0	210	549	-24	-0.02
		0	-83	-66	857	-62	969	-59	44	745	-57	-0.06
	100	0.5	-79	-62	638	-62	997	-62	50	678	-63	-0.06
		0.9	-71	-65	-61	-56	1311	-49	57	241	-56	-0.04
		0	-86	-70	846	-66	907	-62	34	703	-61	-0.06
	200	0.5	-80	-66	775	-65	931	-65	43	624	-66	-0.06
		0.9	-74	-71	-34	-61	1050	-57	34	173	-65	-0.05

Table 5: Predictive \mathbb{R}^2 for 100 observations, binary design with sparse covariates. Reported as % worse than the Oracle – MLE fit on the true nonzero covariates – across 1000 samples.

			% Worse than Oracle									
$\mathrm{sd}(oldsymbol{\eta})/\sigma$	d	ρ	las:	so CV	$\operatorname{GL}\gamma$	= 1 CV	$\operatorname{GL}_{AICc}\gamma$	= 10 CV	margin <i>AICc</i>	al AL CV	MCP	Oracle R^2
		0	23	17	17	14	20	20	14	15	13	0.77
	10	0.5	28	19	20	17	20	26	17	16	15	0.77
		0.9	30	20	22	19	20	29	19	16	17	0.77
		0	26	18	14	17	21	42	16	16	16	0.77
2	50	0.5	34	23	17	23	21	53	19	17	21	0.77
		0.9	37	25	20	27	21	57	22	17	23	0.77
		0	26	18	14	17	21	45	16	16	17	0.77
	100	0.5	34	24	16	24	21	55	19	17	21	0.77
		0.9	37	25	19	28	21	59	21	17	23	0.77
		0	26	19	13	17	21	44	16	16	17	0.77
	200	0.5	34	24	16	24	21	55	19	17	21	0.77
		0.9	37	25	19	29	21	59	21	17	23	0.77
		0	59	59	61	67	99	83	43	79	62	0.43
	10	0.5	63	65	66	70	98	86	47	81	66	0.43
		0.9	65	65	67	71	98	87	48	79	67	0.43
		0	68	67	68	81	102	94	48	83	69	0.43
1	50	0.5	72	73	70	85	101	95	52	84	75	0.43
		0.9	74	74	71	85	100	96	54	82	75	0.43
		0	68	67	68	82	102	95	49	83	69	0.43
	100	0.5	72	73	70	85	101	96	52	84	76	0.43
		0.9	74	74	71	86	101	96	54	82	76	0.43
		0	68	67	68	82	102	95	49	83	69	0.43
	200	0.5	73	74	70	86	102	96	52	84	75	0.43
		0.9	75	74	71	86	101	96	54	82	76	0.43
		0	106	117	345	121	734	126	180	598	126	0.10
	10	0.5	106	120	319	120	740	123	182	613	126	0.10
		0.9	106	118	286	120	714	124	181	579	124	0.10
		0	109	117	526	122	744	126	182	611	129	0.10
0.5	50	0.5	108	121	506	122	748	125	183	616	127	0.10
		0.9	108	120	489	122	734	124	189	593	127	0.10
		0	109	118	550	123	752	127	187	616	130	0.10
	100	0.5	108	124	533	122	753	125	185	619	127	0.10
		0.9	107	121	511	122	740	124	188	597	126	0.10
		0	109	117	551	122	748	127	184	612	129	0.10
	200	0.5	108	124	542	122	759	125	185	624	129	0.09
		0.9	108	123	523	124	743	123	189	600	126	0.10

Table 6: Predictive \mathbb{R}^2 for 100 observations, continuous design with sparse covariates. Reported as % worse than the Oracle – MLE fit on the true nonzero covariates – across 1000 samples.

			% Worse than Oracle									
$\operatorname{ad}(\mathbf{n})/\mathbf{r}$	d	0	lass		$GL \gamma$		$GL \gamma$		margin		МСР	Oracle R^2
$sd(\boldsymbol{\eta})/\sigma$	u	ρ	AICc	CV	AICc	CV	AICc	CV	AICc	CV		
		0	23	17	23	15	21	22	15	15	14	0.78
	10	0.5	61	58	74	57	36	65	39	22	49	0.77
		0.9	45	45	55	45	53	46	29	22	42	0.77
		0	26	18	22	17	20	38	16	15	16	0.77
2	50	0.5	71	70	88	74	23	86	43	22	68	0.77
		0.9	55	53	72	53	62	56	41	32	51	0.78
		0	26	18	21	17	21	41	16	15	16	0.77
	100	0.5	72	70	88	75	23	87	43	22	69	0.77
		0.9	56	53	73	53	61	57	41	33	52	0.77
		0	26	18	21	17	21	39	16	15	16	0.77
	200	0.5	72	70	89	75	23	87	43	22	69	0.78
		0.9	56	53	73	53	59	57	41	33	52	0.78
		0	58	60	79	66	98	83	43	77	62	0.44
	10	0.5	75	78	90	81	94	88	57	79	77	0.44
		0.9	52	55	64	54	59	52	45	49	49	0.44
		0	66	67	87	80	100	93	47	80	69	0.44
1	50	0.5	83	86	97	91	98	98	62	81	86	0.44
		0.9	72	75	91	75	88	83	58	58	72	0.44
		0	67	67	86	81	100	94	48	80	68	0.44
	100	0.5	84	86	97	92	99	98	62	81	86	0.44
		0.9	73	76	93	76	89	84	59	59	73	0.44
		0	67	67	86	81	101	93	48	79	69	0.44
	200	0.5	84	87	97	92	99	98	62	81	86	0.44
		0.9	73	77	93	77	89	85	59	59	73	0.44
		0	102	114	162	117	706	124	167	575	120	0.10
	10	0.5	105	115	115	116	692	121	175	531	119	0.10
		0.9	82	92	99	92	463	102	133	213	92	0.10
		0	105	118	321	122	716	125	173	587	123	0.10
0.5	50	0.5	108	117	134	119	706	123	178	538	122	0.10
		0.9	103	111	113	115	662	120	156	241	115	0.10
		0	105	117	354	122	718	125	174	589	124	0.10
	100	0.5	108	117	141	119	703	123	177	535	122	0.10
		0.9	106	111	113	115	673	120	158	243	115	0.10
		0	105	118	368	122	716	125	174	589	125	0.10
	200	0.5	108	117	147	119	705	123	177	534	121	0.10
		0.9	106	112	113	116	674	121	159	243	115	0.10

Table 7: Predictive \mathbb{R}^2 for 1000 observations, binary design with dense covariates. Reported as % worse than the Oracle – MLE fit on the C_p optimal covariates – across 1000 samples.

			% Worse than Oracle									
$\mathrm{sd}(oldsymbol{\eta})/\sigma$	d	ρ	lass AICc	so CV	$\operatorname{GL}\gamma$	= 1 CV	$\operatorname{GL} \gamma$	= 10 CV	margin AICc	al AL CV	MCP	Oracle \mathbb{R}^2
	10	0 0.5 0.9	3 3 3	3 3 3	2 2 2	2 2 2	1 2 2	1 1 2	2 2 2	2 2 2	1 1 1	0.79 0.79 0.79
2	50	0 0.5 0.9	6 7 7	5 5 5	5 5 5	4 5 5	5 5 5	5 5 5	5 6 6	5 6 6	4 4 4	0.77 0.77 0.77
	100	0 0.5 0.9	9 10 10	6 6 6	7 8 8	5 6 6	7 7 7	7 8 7	8 9 9	7 8 8	5 6 6	0.75 0.75 0.75
	200	0 0.5 0.9	15 18 18	5 5 5	10 11 11	6 6 6	8 8 8	12 13 13	11 13 14	7 9 9	4 5 5	0.71 0.71 0.71
	10	0 0.5 0.9	8 9 10	8 9 10	7 7 8	7 7 8	9 9 9	5 6 6	9 9 10	10 10 10	5 6 6	0.48 0.48 0.48
1	50	0 0.5 0.9	19 21 22	17 19 19	16 18 18	17 18 18	31 30 30	23 24 25	17 19 20	18 20 20	17 18 19	0.44 0.44 0.44
	100	0 0.5 0.9	26 29 30	21 23 23	22 24 24	25 27 27	41 41 41	52 57 58	22 25 26	22 25 25	21 23 23	0.40 0.40 0.40
	200	0 0.5 0.9	35 41 41	21 26 26	25 27 27	46 55 54	47 48 47	94 96 96	24 27 28	21 24 25	21 25 26	0.34 0.34 0.34
	10	0 0.5 0.9	27 29 30	27 30 30	23 25 26	24 26 26	52 53 55	24 26 28	43 45 46	55 58 57	23 24 25	0.17 0.17 0.17
0.5	50	0 0.5 0.9	54 60 61	56 63 65	60 64 64	72 77 78	145 154 146	94 96 96	72 78 79	91 96 96	57 65 66	0.13 0.13 0.13
	100	0 0.5 0.9	62 69 71	69 76 78	87 89 90	93 95 96	150 158 154	101 101 101	85 91 93	113 119 119	68 77 78	0.09 0.09 0.09
	200	0 0.5 0.9	53 65 68	65 75 78	163 156 155	101 101 101	156 162 160	104 104 104	100 109 114	158 169 167	66 76 80	0.04 0.04 0.04

Table 8: Predictive \mathbb{R}^2 for 1000 observations, continuous design with dense covariates. Reported as % worse than the Oracle – MLE fit on the C_p optimal covariates – across 1000 samples.

			% Worse than Oracle									
$\mathrm{sd}({m{\eta}})/\sigma$	d	ρ	las: AICc	so CV	$\operatorname{GL} \gamma$	= 1 CV	$\operatorname{GL}_{AICc}\gamma$	= 10 CV	margin <i>AICc</i>	al AL CV	MCP	Oracle R^2
		0	3	3	2	2	2	1	2	2	1	0.79
	10	0.5	5	5	4	4	3	2	8	8	2	0.79
		0.9	7	6	6	5	4	4	10	10	3	0.79
		0	6	5	5	4	5	5	5	5	4	0.77
2	50	0.5	11	8	9	7	6	6	14	14	6	0.77
		0.9	14	10	11	9	7	7	44	44	7	0.77
		0	9	6	7	5	7	7	8	7	5	0.75
	100	0.5	18	9	13	8	9	9	21	17	9	0.75
		0.9	23	10	16	10	9	9	56	56	11	0.75
		0	16	5	11	6	8	12	11	7	4	0.71
	200	0.5	50	11	24	12	11	75	34	25	10	0.71
		0.9	91	42	85	45	12	92	68	68	60	0.71
		0	9	9	7	7	8	6	9	10	5	0.48
	10	0.5	16	16	14	13	10	9	18	18	7	0.48
		0.9	23	22	20	19	16	14	10	10	11	0.48
		0	19	17	17	17	27	23	17	18	17	0.44
1	50	0.5	38	32	32	29	28	34	39	38	25	0.44
		0.9	70	68	70	53	66	56	46	46	31	0.44
		0	26	20	24	25	45	52	22	22	20	0.40
	100	0.5	64	57	56	61	51	95	51	47	57	0.40
		0.9	86	88	90	88	89	88	65	67	85	0.40
		0	35	21	27	47	66	94	23	21	21	0.34
	200	0.5	84	87	93	94	84	99	58	52	87	0.34
		0.9	91	93	95	93	96	94	81	83	93	0.34
		0	27	28	27	24	48	25	44	57	24	0.17
	10	0.5	49	52	46	44	62	41	71	77	29	0.17
		0.9	44	45	44	43	42	42	29	28	39	0.18
	_	0	54	57	74	71	101	94	72	90	58	0.13
0.5	50	0.5	90	95	98	96	101	100	108	117	95	0.13
		0.9	79	80	81	79	79	77	83	81	76	0.13
		0	62	68	96	93	102	101	84	112	68	0.09
	100	0.5	94	98	101	100	102	101	118	132	98	0.09
		0.9	87	89	92	88	95	89	95	92	88	0.09
		0	54	65	110	100	102	104	98	157	67	0.04
	200	0.5	92	98	102	102	102	103	141	169	98	0.04
		0.9	91	94	99	95	101	99	108	103	95	0.05

Table 9: Predictive \mathbb{R}^2 for 1000 observations, binary design with sparse covariates. Reported as % worse than the Oracle – MLE fit on the true nonzero covariates – across 1000 samples.

			% Worse than Oracle									
$\mathrm{sd}(oldsymbol{\eta})/\sigma$	d	ρ	las:	so CV	$\operatorname{GL} \gamma$	= 1 CV	$\operatorname{GL}_{AICc}\gamma$	= 10 CV	margir <i>AICc</i>	al AL CV	MCP	Oracle R^2
	10	0 0.5 0.9	1 1 1	1 1 1	1 1 1	1 1 1	0 0 0	0 0 0	1 1 1	1 1 1	0 0 0	0.78 0.78 0.78
2	50	0 0.5 0.9	6 7 7	6 6 6	5 6 6	5 5 5	5 5 5	4 5 5	6 6 7	5 6 6	4 4 4	0.78 0.78 0.78
	100	0 0.5 0.9	7 7 8	6 6 6	5 5 6	5 5 5	4 4 4	3 3 3	6 7 7	6 6 7	3 3 3	0.78 0.78 0.78
	200	0 0.5 0.9	7 7 8	6 6 6	5 5 5	4 5 5	3 3 3	2 2 2	5 6 7	5 6 6	1 1 1	0.78 0.78 0.78
	10	0 0.5 0.9	2 3 3	2 3 3	0 1 1	0 1 1	2 2 2	-1 -1 -1	2 3 3	3 4 4	-2 -1 -1	0.45 0.45 0.45
1	50	0 0.5 0.9	20 22 22	18 20 20	17 18 19	18 19 19	31 31 30	23 23 24	18 20 20	19 21 21	18 19 19	0.45 0.45 0.45
	100	0 0.5 0.9	26 28 29	23 24 25	23 24 24	24 25 25	38 38 38	36 38 39	23 26 26	24 26 27	23 24 25	0.45 0.45 0.45
	200	0 0.5 0.9	28 30 31	24 26 26	25 26 27	26 28 28	42 42 42	45 50 51	25 28 29	26 28 29	24 26 26	0.45 0.45 0.45
	10	0 0.5 0.9	-9 -5 -4	-8 -4 -3	-14 -11 -10	-13 -10 -9	29 30 33	-13 -11 -7	16 18 19	34 38 36	-14 -13 -12	0.12 0.12 0.12
0.5	50	0 0.5 0.9	49 55 57	52 59 60	55 59 60	68 72 74	144 158 150	93 95 95	69 75 76	89 95 94	52 60 61	0.12 0.12 0.12
	100	0 0.5 0.9	64 70 71	68 75 76	79 82 82	90 92 93	139 146 141	100 100 101	82 88 89	103 108 108	68 76 77	0.12 0.12 0.12
	200	0 0.5 0.9	69 75 76	73 80 81	94 95 95	95 97 97	127 132 130	101 101 101	86 92 93	107 113 113	73 80 82	0.12 0.12 0.12

Table 10: Predictive \mathbb{R}^2 for 1000 observations, continuous design with sparse covariates. Reported as % worse than the Oracle – MLE fit on the true nonzero covariates – across 1000 samples.

			% Worse than Oracle									
$\mathrm{sd}(oldsymbol{\eta})/\sigma$	d	ho	las:	so CV	$\operatorname{GL} \gamma$	= 1 CV	$\operatorname{GL}_{AICc}\gamma$	= 10 CV	margin <i>AICc</i>	al AL CV	MCP	Oracle R ²
		0	1	1	1	1	0	0	1	1	0	0.78
	10	0.5	4	3	3	2	1	1	7	7	0	0.78
		0.9	5	5	4	4	2	2	9	9	1	0.78
		0	6	6	5	5	5	4	6	5	4	0.78
2	50	0.5	11	9	9	8	6	6	15	14	5	0.78
		0.9	14	10	11	9	7	7	45	44	7	0.78
		0	7	6	5	5	4	3	6	6	3	0.78
	100	0.5	12	9	9	7	4	5	17	15	3	0.78
		0.9	15	11	11	9	6	6	54	53	5	0.78
	_	0	7	6	5	4	3	2	5	5	1	0.78
	200	0.5	12	9	8	7	3	3	17	15	1	0.78
		0.9	14	11	10	9	4	5	53	52	2	0.78
		0	2	2	1	0	2	-1	2	3	-1	0.45
	10	0.5	10	10	7	7	4	3	12	12	0	0.45
		0.9	17	17	14	13	10	8	3	3	4	0.45
		0	20	18	18	17	27	23	18	19	18	0.45
1	50	0.5	38	32	32	29	29	34	39	38	25	0.45
		0.9	68	65	67	51	63	52	47	46	30	0.45
		0	26	23	24	24	36	36	23	24	23	0.45
	100	0.5	53	45	42	42	40	77	50	47	39	0.45
		0.9	85	86	88	83	86	87	63	64	68	0.45
		0	28	24	26	26	43	45	25	26	24	0.45
	200	0.5	65	55	48	57	46	96	54	51	54	0.45
		0.9	87	89	91	88	90	90	71	73	87	0.45
		0	-8	-7	-8	-12	23	-11	16	35	-13	0.12
	10	0.5	25	28	20	18	44	12	57	66	-5	0.12
		0.9	16	17	16	15	12	12	-7	-8	7	0.12
		0	49	52	70	67	101	93	68	88	52	0.12
0.5	50	0.5	89	94	98	96	101	100	107	119	94	0.12
		0.9	76	77	79	76	76	74	80	78	73	0.12
		0	63	68	91	90	102	100	81	102	67	0.12
	100	0.5	94	98	100	100	101	101	113	124	98	0.12
		0.9	87	88	91	88	93	88	93	91	87	0.12
		0	69	73	97	95	101	101	86	107	73	0.12
	200	0.5	96	98	101	100	101	101	114	126	99	0.12
		0.9	91	93	96	93	99	95	97	94	93	0.12

Table 11: Predictive MSE for n=100, binary design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	0.99	0.94	1.06	0.53	0.87			
CV.min	0.59	0.63	0.84	0.51	0.62	0.61		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.72	0.67	0.54	0.56			0.54	$\rho = 0$
AIC	0.55	0.55	0.56	0.52				Oracle: 0.37
BIC	0.55	0.55	0.56	0.53				01466.0.37
CV.1se	0.97	0.92	0.99	0.49	0.83			
CV.min	0.58	0.60	0.79	0.46	0.59	0.59		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.69	0.64	0.48	0.52			0.48	$\rho = 0.5$
AIC	0.49	0.49	0.50	0.47				Oracle : 0.33
BIC	0.49	0.49	0.50	0.48				Oracie: 0.55
CV.1se	0.93	0.89	0.96	0.47	0.80			
CV.min	0.56	0.59	0.78	0.44	0.58	0.58		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.67	0.63	0.46	0.50			0.46	$\rho = 0.9$
AIC	0.46	0.47	0.47	0.45				0 1 021
BIC	0.46	0.47	0.47	0.46				Oracle: 0.31
CV.1se	2.18	2.18	2.20	1.79	2.17			
CV.min	1.91	2.00	2.13	2.03	1.93	1.92		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.91	1.92	2.21	1.73			2.20	$\rho = 0$
AIC	2.21	2.22	2.24	2.15				,
BIC	2.20	2.21	2.24	2.15				Oracle: 1.40
CV.1se	1.98	1.98	1.99	1.64	1.97			
CV.min	1.75	1.82	1.93	1.83	1.77	1.75		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.74	1.76	1.97	1.57			1.97	$\rho = 0.5$
AIC	1.98	1.99	2.01	1.93			1.77	,
BIC	1.98	1.98	2.01	1.93				Oracle: 1.26
CV.1se	1.88	1.87	1.88	1.54	1.86			
CV.rise CV.min	1.66	1.72	1.82	1.72	1.67	1.67		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.66	1.67	1.86	1.5	1.07	1.07	1.86	$\rho = 0.9$
AIC	1.87	1.88	1.90	1.83			1.00	,
BIC	1.87	1.88	1.90	1.82				Oracle: 1.19
CV.1se	5.67	5.67	5.68	6.91	5.67			
CV.1sc CV.min	5.68	5.70	5.71	8.23	5.72	5.72		$sd(\mu)/\sigma = 0.5$
AICc	5.61	7.11	8.94	6.01	3.12	3.12	8.94	$\rho = 0$
AIC	8.88	8.93	9.00	8.74			0.74	$\rho = 0$
BIC	8.87	8.92	9.00	8.73				Oracle: 5.30
CV.1se	5.08	5.08	5.08	6.21	5.08			
CV.1se CV.min		5.11				5.13		ad()/- 05
	5.09		5.11	7.39	5.13	3.13	7.00	
AICc	5.03	6.20	7.98	5.41			7.99	$\rho = 0.5$
AIC BIC	7.93	7.98	8.04	7.81				Oracle: 4.74
	7.93	7.97	8.04	7.81	4.02			
CV.1se	4.82	4.83	4.83	5.84	4.83	4.00		-1()/ 05
CV.min	4.84	4.85	4.86	6.96	4.86	4.89	7.56	$sd(\mu)/\sigma = 0.5$
AICc	4.77	5.83	7.57	5.14			7.56	$\rho = 0.9$
AIC	7.53	7.57	7.63	7.41				<i>Oracle</i> : 4.52
BIC	7.52	7.56	7.63	7.40				

Table 12: Predictive MSE for n=100, binary design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	7.33	7.44	7.46	3.26	7.34			
CV.min	5.91	6.93	7.27	2.95	5.82	6.07		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.28	3.35	3.02	4.31			3.02	$\rho = 0$
AIC	2.98	3.00	3.03	2.94				Oracle: 2.73
BIC	2.98	3.00	3.03	2.94				01 acic . 2.13
CV.1se	6.67	6.68	6.71	2.96	6.66			
CV.min	5.46	6.27	6.57	2.64	5.45	5.56		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.70	3.11	2.70	3.86			2.71	$\rho = 0.5$
AIC	2.67	2.68	2.71	2.63				Oracle: 2.45
BIC	2.67	2.68	2.71	2.63				Oracie . 2.43
CV.1se	6.28	6.30	6.35	2.89	6.29			
CV.min	5.24	5.94	6.21	2.51	5.27	5.32		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.46	3.15	2.55	3.77			2.55	$\rho = 0.9$
AIC	2.52	2.54	2.56	2.49				0 1 221
BIC	2.52	2.54	2.56	2.49				Oracle: 2.31
CV.1se	12.07	12.11	12.12	10.25	12.07			
CV.min	11.33	11.94	12.07	11.32	11.41	11.48		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.31	11.06	12.10	10.12			12.09	$\rho = 0$
AIC	11.96	12.05	12.14	11.78				,
BIC	11.96	12.04	12.14	11.77				Oracle: 9.58
CV.1se	10.82	10.84	10.85	9.17	10.82			
CV.min	10.25	10.69	10.82	10.09	10.33	10.36		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.15	9.82	10.78	9.06	10.00	10.00	10.78	$\rho = 0.5$
AIC	10.66	10.73	10.82	10.49			10.70	,
BIC	10.65	10.72	10.82	10.49				Oracle: 8.54
CV.1se	10.25	10.72	10.27	8.73	10.26			
CV.13C CV.min	9.73	10.12	10.23	9.51	9.75	9.80		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	9.66	9.31	10.20	8.66	7.13	7.00	10.21	$\rho = 0.9$
AIC	10.09	10.16	10.24	9.93			10.21	$\rho = 0.3$
BIC	10.08	10.15	10.24	9.93				Oracle: 8.05
CV.1se	30.53	30.55	30.60	37.75	30.56			
CV.1se CV.min	30.55	30.33	30.82	44.89	30.81	30.94		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	30.09	45.69	48.52	32.65	30.61	30.94	48.53	$\rho = 0$
AICC	47.87	48.29	48.60	47.19			40.33	$\rho = 0$
BIC								Oracle: 31.48
CV.1se	47.84 27.31	48.27 27.33	48.60 27.33	47.17 33.73	27.33			
						27.71		-1()/- 0.5
CV.min	27.44	27.49	27.51	39.84	27.55	27.71	12.20	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	27.22	40.56	43.22	29.07			43.30	$\rho = 0.5$
AIC	42.66	43.03	43.30	42.06				Oracle: 28.08
BIC	42.64	43.01	43.30	42.04				
CV.1se	25.85	25.87	25.88	31.38	25.87			
CV.min	26.00	25.97	26.03	37.38	26.07	26.25		$sd(\mu)/\sigma = 0.5$
AICc	25.67	38.25	40.92	27.59			41.08	$\rho = 0.9$
AIC	40.38	40.73	40.99	39.78				Oracle : 26.61
BIC	40.36	40.71	40.99	39.76				2.400.01

Table 13: Predictive MSE for n=100, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	14.97	15.13	15.17	6.70	15.02			
CV.min	12.62	14.61	14.91	5.99	12.53	12.89		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	13.31	6.05	6.12	9.01			6.14	$\rho = 0$
AIC	6.04	6.08	6.13	5.96				Oracle: 6.12
BIC	6.04	6.08	6.13	5.96				07 acte : 0.12
CV.1se	13.48	13.54	13.55	6.03	13.50			
CV.min	11.56	13.10	13.37	5.35	11.65	11.77		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	11.88	5.49	5.44	8.14			5.46	$\rho = 0.5$
AIC	5.37	5.41	5.45	5.31				<i>Oracle</i> : 5.45
BIC	5.37	5.41	5.45	5.3				074000.5.45
CV.1se	12.74	12.81	12.84	5.92	12.80			
CV.min	10.99	12.38	12.67	5.11	10.93	11.21		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	11.29	5.27	5.17	7.86			5.16	$\rho = 0.9$
AIC	5.10	5.14	5.18	5.04				<i>Oracle</i> : 5.16
BIC	5.10	5.13	5.18	5.04				07466.5.10
CV.1se	24.48	24.56	24.57	20.88	24.50			
CV.min	23.19	24.40	24.52	22.96	23.24	23.46		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	23.11	23.13	24.53	20.63			24.52	$\rho = 0$
AIC	24.21	24.42	24.58	23.85				<i>Oracle</i> : 21.34
BIC	24.20	24.41	24.58	23.84				Oracle . 21.34
CV.1se	21.91	21.95	21.95	18.66	21.94			
CV.min	20.91	21.80	21.92	20.46	21.03	21.13		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	20.78	20.54	21.87	18.48			21.87	$\rho = 0.5$
AIC	21.58	21.76	21.91	21.26				Oracle: 19.00
BIC	21.57	21.76	21.91	21.25				Oracle . 19.00
CV.1se	20.67	20.71	20.72	17.65	20.70			
CV.min	19.66	20.53	20.67	19.21	19.67	19.78		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	19.53	19.34	20.61	17.53			20.58	$\rho = 0.9$
AIC	20.35	20.51	20.66	20.05				<i>Oracle</i> : 17.97
BIC	20.34	20.50	20.66	20.04				Oracle . 17.97
CV.1se	61.84	61.86	61.92	76.46	61.85			
CV.min	62.12	62.25	62.34	90.65	62.44	62.36		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	61.54	94.48	98.16	66.07			98.14	$\rho = 0$
AIC	96.74	97.74	98.25	95.38				Oracle : 64.46
BIC	96.70	97.70	98.25	95.35				07466.04.40
CV.1se	55.33	55.40	55.36	68.27	55.34			
CV.min	55.59	55.77	55.74	80.79	55.83	56.06		$sd(\mu)/\sigma = 0.5$
AICc	55.07	83.89	87.52	59.02			87.55	$\rho = 0.5$
AIC	86.29	87.15	87.62	85.08				Oracle : 57.58
BIC	86.25	87.11	87.62	85.05				Oracle . 37.36
CV.1se	52.31	52.35	52.39	63.43	52.34			
CV.min	52.51	52.62	52.66	75.65	52.69	52.76		$sd(\mu)/\sigma = 0.5$
AICc	51.93	79.08	82.74	55.84			82.80	$\rho = 0.9$
AIC	81.57	82.38	82.83	80.38				Oracle : 54.48
BIC	81.52	82.35	82.83	80.28				01 acic . 34.40

Table 14: Predictive MSE for n=100, binary design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	30.33	30.56	30.60	13.61	30.38			
CV.min	26.07	29.77	30.17	12.06	25.72	26.61		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	27.01	12.04	12.33	18.27			12.32	$\rho = 0$
AIC	12.15	12.26	12.34	12				<i>Oracle</i> : 12.55
BIC	12.15	12.26	12.34	12				07acte . 12.33
CV.1se	27.21	27.33	27.35	12.36	27.28			
CV.min	23.89	26.73	27.01	10.79	23.88	24.36		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	24.26	10.74	10.99	16.73			11.03	$\rho = 0.5$
AIC	10.83	10.93	11.00	10.7				Oracle: 11.21
BIC	10.83	10.92	11.00	10.7				Oracie: 11.21
CV.1se	25.68	25.79	25.82	11.97	25.74			
CV.min	22.64	25.13	25.46	10.24	22.44	22.96		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	22.74	10.23	10.38	15.86			10.38	$\rho = 0.9$
AIC	10.24	10.33	10.39	10.12				0110-60
BIC	10.23	10.32	10.39	10.12				Oracle: 10.60
CV.1se	49.21	49.37	49.37	42.14	49.29			
CV.min	46.77	49.09	49.30	46.25	46.84	47.45		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	46.69	47.26	49.34	41.64			49.49	$\rho = 0$
AIC	48.63	49.11	49.40	47.93				•
BIC	48.61	49.09	49.40	47.91				<i>Oracle</i> : 46.19
CV.1se	44.03	44.14	44.15	37.50	44.11			
CV.min	42.08	43.93	44.11	41.17	42.30	42.64		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	41.73	42.04	43.94	37.24			43.91	$\rho = 0.5$
AIC	43.31	43.73	43.99	42.68				·
BIC	43.29	43.72	43.99	42.67				Oracle: 41.04
CV.1se	41.58	41.69	41.70	35.58	41.60			
CV.min	39.52	41.37	41.58	38.66	39.66	39.88		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	39.23	39.74	41.49	35.18			41.47	$\rho = 0.9$
AIC	40.90	41.29	41.54	40.32				·
BIC	40.88	41.27	41.54	40.30				Oracle: 38.90
CV.1se	124.66	124.81	124.79	154.61	124.68			
CV.min	125.32	125.62	125.84	182.91	125.93	126.26		$sd(\mu)/\sigma = 0.5$
AICc	124.15	193.36	198.18	133.05			198.35	$\rho = 0$
AIC	195.19	197.42	198.29	192.44				0 1 120 14
BIC	195.11	197.36	198.28	192.34				Oracle: 130.14
CV.1se	111.25	111.38	111.34	136.84	111.28			
CV.min	111.79	112.04	112.02	162.37	112.21	112.54		$sd(\mu)/\sigma = 0.5$
AICc	110.75	171.44	176.10	118.55			175.96	$\rho = 0.5$
AIC	173.46	175.42	176.20	171.07				0 1 116.02
BIC	173.39	175.35	176.19	171.01				<i>Oracle</i> : 116.03
CV.1se	105.14	105.23	105.25	127.70	105.21			
CV.min	105.41	105.68	105.77	152.09	105.93	105.96		$sd(\mu)/\sigma = 0.5$
AICc	104.31	161.77	166.42	112.41			166.20	$\rho = 0.9$
AIC	163.88	165.73	166.50	161.47				ŕ
BIC	163.80	165.66	166.50	161.41				Oracle: 109.94

Table 15: Predictive MSE for n=100, continuous design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	4.07	3.93	4.31	2.11	3.58			
CV.min	2.44	2.60	3.40	2.03	2.52	2.53		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	2.89	3.36	2.23	2.24			2.39	$\rho = 0$
AIC	2.20	2.21	2.24	2.10				Oracle: 1.48
BIC	2.20	2.20	2.23	2.15				07 acre : 1.40
CV.1se	2.01	1.97	1.89	1.04	1.82			
CV.min	1.54	1.55	1.68	0.84	1.44	1.50		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.57	1.81	1.01	1.16			1.26	$\rho = 0.5$
AIC	0.83	0.84	0.84	0.82				Oracle: 0.56
BIC	0.83	0.84	0.84	0.91				07 acre : 0.50
CV.1se	0.40	0.39	0.34	0.29	0.37			
CV.min	0.32	0.32	0.32	0.22	0.31	0.32		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.32	0.35	0.33	0.25			0.32	$\rho = 0.9$
AIC	0.22	0.22	0.22	0.2				Oracle: 0.15
BIC	0.24	0.23	0.22	0.32				07 acre : 0.15
CV.1se	8.82	8.80	8.92	7.23	8.80			
CV.min	7.73	8.04	8.56	8.16	7.76	7.79		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.66	8.50	8.88	6.93			8.56	$\rho = 0$
AIC	8.87	8.91	9.00	8.65				Oracle: 5.62
BIC	8.87	8.91	9.00	8.63				Oracic . 5.02
CV.1se	3.39	3.38	3.36	2.83	3.36			
CV.min	3.11	3.16	3.26	3.07	3.11	3.10		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.08	3.29	3.31	2.79			3.20	$\rho = 0.5$
AIC	3.35	3.36	3.39	3.28				Oracle: 2.11
BIC	3.35	3.36	3.39	3.27				Oracic . 2.11
CV.1se	0.84	0.82	0.74	0.72	0.79			
CV.min	0.71	0.71	0.69	0.70	0.69	0.69		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.70	0.74	0.71	0.68			0.70	$\rho = 0.9$
AIC	0.89	0.89	0.91	0.80				Oracle: 0.56
BIC	0.89	0.89	0.91	0.70				07 acre : 0.50
CV.1se	22.83	22.84	22.85	27.74	22.85			
CV.min	22.87	22.91	23.01	33.04	22.94	22.99		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	22.53	24.53	35.87	24.03			33.38	$\rho = 0$
AIC	35.61	35.81	36.11	35.06				<i>Oracle</i> : 21.25
BIC	35.59	35.80	36.10	35.04				Oracic . 21.23
CV.1se	8.59	8.59	8.60	10.06	8.59			
CV.min	8.58	8.59	8.64	12.07	8.62	8.65		$sd(\mu)/\sigma = 0.5$
AICc	8.52	8.61	13.38	9.09			11.49	$\rho = 0.5$
AIC	13.39	13.44	13.56	13.17				<i>Oracle</i> : 7.97
BIC	13.38	13.44	13.56	13.15				01466.1.71
CV.1se	2.33	2.32	2.32	2.29	2.32			
CV.min	2.26	2.26	2.29	2.53	2.26	2.26		$sd(\mu)/\sigma = 0.5$
AICc	2.24	2.28	3.11	2.34			2.28	$\rho = 0.9$
AIC	3.61	3.62	3.67	3.44				Oracle: 2.11
BIC	3.60	3.62	3.67	2.66				07 west . 2.11

Table 16: Predictive MSE for n=100, continuous design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	29.84	30.21	30.39	13.26	29.97			
CV.min	24.06	28.29	29.64	11.90	24.04	24.66		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.41	22.67	12.22	17.14			14.70	$\rho = 0$
AIC	12.07	12.15	12.26	11.89				Oracle: 11.08
BIC	12.07	12.14	12.26	11.88				Oracie . 11.00
CV.1se	10.41	10.41	10.42	5.40	10.39			
CV.min	9.40	9.94	10.30	4.26	9.42	9.43		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	9.31	10.16	4.16	6.64			5.91	$\rho = 0.5$
AIC	4.13	4.15	4.18	4.09				Oracle: 3.78
BIC	4.13	4.14	4.18	4.08				Oracie: 5.78
CV.1se	1.88	1.86	1.83	1.54	1.85			
CV.min	1.60	1.61	1.69	1.12	1.59	1.58		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.55	1.78	1.31	1.26			1.53	$\rho = 0.9$
AIC	0.75	0.75	0.76	0.74				01060
BIC	0.75	0.75	0.76	1.38				Oracle: 0.68
CV.1se	48.97	49.08	49.11	41.41	49.03			
CV.min	46.03	48.36	48.95	45.64	46.16	46.53		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	45.69	46.15	48.71	40.67			47.97	$\rho = 0$
AIC	48.15	48.51	48.87	47.37				•
BIC	48.13	48.49	48.86	47.35				Oracle: 38.53
CV.1se	16.82	16.83	16.85	14.38	16.81			
CV.min	16.23	16.58	16.82	15.44	16.19	16.25		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	16.03	16.57	16.64	14.36			16.44	$\rho = 0.5$
AIC	16.54	16.62	16.77	16.30				•
BIC	16.53	16.61	16.76	16.29				Oracle: 13.23
CV.1se	3.06	3.06	3.06	2.82	3.06			
CV.min	2.89	2.90	2.99	2.61	2.88	2.88		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.83	3.01	2.98	2.64			2.84	$\rho = 0.9$
AIC	2.99	3.00	3.04	2.88				•
BIC	2.99	3.00	3.04	2.87				Oracle: 2.37
CV.1se	123.67	123.68	123.80	151.41	123.69			
CV.min	124.09	124.31	124.59	180.32	125.12	125.16		$sd(\mu)/\sigma = 0.5$
AICc	122.78	181.19	195.40	131.22			183.19	$\rho = 0$
AIC	192.75	194.48	195.68	189.98				•
BIC	192.67	194.40	195.66	189.91				Oracle: 126.96
CV.1se	42.38	42.39	42.42	49.61	42.42			
CV.min	42.56	42.60	42.70	59.52	42.68	42.99		$sd(\mu)/\sigma = 0.5$
AICc	42.17	50.84	66.80	45.06	.2.00	,,	59.79	$\rho = 0.5$
AIC	66.10	66.57	67.06	65.12			0,.,,	•
BIC	66.07	66.53	67.05	65.09				Oracle: 43.47
CV.1se	7.73	7.73	7.74	7.84	7.73			
CV.rse CV.min	7.71	7.73	7.78	8.64	7.74	7.76		$sd(\mu)/\sigma = 0.5$
AICc	7.66	7.72	12.06	8.10			7.97	$\rho = 0.9$
AIC	11.97	12.05	12.19	11.58			1.21	•
BIC	11.96	12.05	12.13	10.18				Oracle: 7.75
	11.90	12.03	12.10	10.10				

Table 17: Predictive MSE for n=100, continuous design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	61.16	61.57	61.63	27.47	61.23			
CV.min	51.50	59.56	60.70	24.23	51.80	52.42		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	53.49	32.73	24.78	36.31			29.58	$\rho = 0$
AIC	24.45	24.64	24.82	24.13				<i>Oracle</i> : 24.83
BIC	24.44	24.63	24.82	24.14				Oracle . 24.63
CV.1se	20.83	20.84	20.86	10.87	20.84			
CV.min	19.15	20.19	20.68	8.57	19.09	19.18		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	18.93	18.83	8.35	13.38			11.41	$\rho = 0.5$
AIC	8.26	8.30	8.37	8.18				Oracle: 8.37
BIC	8.25	8.30	8.37	8.21				01 acte . 6.51
CV.1se	3.54	3.54	3.53	3.00	3.54			
CV.min	3.20	3.27	3.41	2.17	3.21	3.20		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.11	3.48	1.60	2.48			3.07	$\rho = 0.9$
AIC	1.40	1.40	1.42	1.38				Oracle: 1.42
BIC	1.40	1.40	1.42	2.30				Oracle : 1.42
CV.1se	99.62	99.74	99.82	84.51	99.66			
CV.min	94.55	98.98	99.72	92.58	94.75	95.42		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	93.78	93.69	99.07	83.67			97.14	$\rho = 0$
AIC	97.75	98.62	99.27	96.27				Oma ala . 96 16
BIC	97.71	98.58	99.26	96.23				<i>Oracle</i> : 86.46
CV.1se	33.64	33.67	33.71	28.79	33.68			
CV.min	32.47	33.31	33.69	30.80	32.52	32.68		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	32.08	32.43	33.36	28.83			33.03	$\rho = 0.5$
AIC	33.02	33.24	33.49	32.55				Oma ala . 20 10
BIC	33.00	33.22	33.49	32.53				<i>Oracle</i> : 29.19
CV.1se	5.73	5.73	5.73	5.38	5.74			
CV.min	5.53	5.59	5.70	4.97	5.53	5.53		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.44	5.70	5.62	5.05			5.46	$\rho = 0.9$
AIC	5.58	5.61	5.68	5.42				Oma ala . 4 00
BIC	5.58	5.61	5.68	5.44				Oracle: 4.90
CV.1se	250.85	250.88	251.03	307.99	251.08			
CV.min	251.92	252.45	253.02	365.30	253.21	254.15		$sd(\mu)/\sigma = 0.5$
AICc	249.33	381.45	396.97	266.84			369.87	$\rho = 0$
AIC	391.16	395.18	397.28	385.61				01260.02
BIC	390.99	395.04	397.25	385.45				<i>Oracle</i> : 260.93
CV.1se	84.75	84.79	84.80	98.73	84.80			
CV.min	85.25	85.31	85.31	118.99	85.26	85.82		$sd(\mu)/\sigma = 0.5$
AICc	84.43	117.72	133.55	90.21			120.78	$\rho = 0.5$
AIC	131.83	132.94	133.82	129.89				0 1 07 07
BIC	131.76	132.88	133.81	129.82				<i>Oracle</i> : 87.87
CV.1se	14.44	14.44	14.45	14.67	14.45			
CV.min	14.44	14.49	14.54	16.22	14.49	14.53		$sd(\mu)/\sigma = 0.5$
AICc	14.39	14.47	22.61	15.14			15.23	$\rho = 0.9$
AIC	22.32	22.50	22.75	21.62				·
BIC	22.31	22.50	22.74	18.94				<i>Oracle</i> : 14.79

Table 18: Predictive MSE for n=100, continuous design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	123.78	124.17	124.38	55.67	123.87			
CV.min	105.81	121.52	122.75	48.79	106.45	108.24		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	109.36	52.25	49.94	74.35			58.01	$\rho = 0$
AIC	49.18	49.63	49.96	48.59				Oracle: 50.89
BIC	49.16	49.61	49.96	48.58				07acic . 30.07
CV.1se	41.62	41.63	41.66	21.97	41.60			
CV.min	38.52	40.66	41.36	17.13	38.32	38.69		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	37.84	29.69	16.67	26.77			22.67	$\rho = 0.5$
AIC	16.46	16.57	16.70	16.31				<i>Oracle</i> : 17.03
BIC	16.45	16.57	16.69	16.3				Oracie: 17.03
CV.1se	6.86	6.85	6.85	5.93	6.86			
CV.min	6.37	6.53	6.75	4.25	6.36	6.35		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.19	6.79	2.75	4.94			5.95	$\rho = 0.9$
AIC	2.70	2.71	2.74	2.67				0 1 200
BIC	2.69	2.71	2.74	4.17				Oracle: 2.80
CV.1se	200.18	200.56	200.62	170.55	200.38			
CV.min	190.91	199.28	200.41	186.30	190.80	193.05		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	189.24	191.81	199.68	168.56			197.28	$\rho = 0$
AIC	196.78	198.74	199.88	193.84				
BIC	196.71	198.66	199.87	193.77				<i>Oracle</i> : 186.60
CV.1se	67.24	67.30	67.34	57.55	67.30			
CV.min	64.84	66.87	67.31	61.27	64.94	65.33		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	64.19	63.51	66.78	57.55			66.20	$\rho = 0.5$
AIC	65.93	66.46	66.92	65.00				·
BIC	65.88	66.43	66.91	64.97				Oracle: 62.50
CV.1se	11.08	11.07	11.08	10.48	11.08			
CV.min	10.75	10.89	11.04	9.69	10.77	10.78		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.58	11.04	10.92	9.86			10.61	$\rho = 0.9$
AIC	10.79	10.87	10.99	10.50				·
BIC	10.79	10.87	10.99	10.60				Oracle: 10.21
CV.1se	505.57	505.68	505.88	621.63	505.30			
CV.min	507.03	508.25	509.82	736.30	509.71	511.25		$sd(\mu)/\sigma = 0.5$
AICc	502.04	779.80	797.64	536.72			735.78	$\rho = 0$
AIC	787.28	796.26	799.84	776.11				
BIC	786.99	795.99	799.78	775.79				<i>Oracle</i> : 527.53
CV.1se	169.34	169.55	169.49	197.63	169.47			
CV.min	170.16	170.31	170.41	237.39	170.31	171.26		$sd(\mu)/\sigma = 0.5$
AICc	168.77	252.44	267.51	180.60	-, -, -		241.61	$\rho = 0.5$
AIC	263.70	266.29	267.81	259.78				,
BIC	263.52	266.19	267.78	259.63				<i>Oracle</i> : 176.63
CV.1se	27.83	27.83	27.85	28.27	27.84			
CV.rise CV.min	27.80	27.97	28.03	31.23	27.92	27.95		$sd(\mu)/\sigma = 0.5$
AICc	27.75	28.33	43.63	29.27	21.,72	2,.,,	29.04	$\rho = 0.9$
AIC	43.01	43.43	43.86	41.67			27.01	·
BIC	42.99	43.41	43.84	36.55				Oracle: 28.81
DIC	74,77	73.71	75.07	50.55				

Table 19: Predictive MSE for n=100, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	0.64	0.57	0.63	0.4	0.47			
CV.min	0.42	0.4	0.46	0.41	0.4	0.41		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.48	0.43	0.46	0.4			0.45	$\rho = 0$
AIC	0.47	0.47	0.48	0.44				Oracle: 0.27
BIC	0.47	0.47	0.48	0.44				07466 . 0.27
CV.1se	0.65	0.57	0.63	0.38	0.46			
CV.min	0.40	0.38	0.45	0.38	0.37	0.38		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47	0.41	0.41	0.39			0.41	$\rho = 0.5$
AIC	0.42	0.42	0.43	0.40				Oracle: 0.24
BIC	0.42	0.42	0.43	0.40				074666.0.24
CV.1se	0.64	0.56	0.63	0.36	0.45			
CV.min	0.39	0.38	0.45	0.36	0.36	0.38		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.46	0.40	0.38	0.38			0.38	$\rho = 0.9$
AIC	0.40	0.40	0.41	0.38				Oracle: 0.23
BIC	0.40	0.40	0.41	0.38				07 dete : 0.25
CV.1se	1.86	1.86	1.89	1.52	1.84			
CV.min	1.58	1.65	1.78	1.74	1.60	1.59		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.58	1.60	1.91	1.45			1.91	$\rho = 0$
AIC	1.91	1.92	1.94	1.86				Oracle : 1.09
BIC	1.91	1.92	1.94	1.85				074666.1.07
CV.1se	1.69	1.68	1.70	1.39	1.67			
CV.min	1.46	1.50	1.62	1.57	1.47	1.46		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.45	1.46	1.70	1.32			1.70	$\rho = 0.5$
AIC	1.71	1.72	1.74	1.66				Oracle: 0.97
BIC	1.71	1.72	1.73	1.66				Oracic . 0.57
CV.1se	1.60	1.60	1.62	1.31	1.58			
CV.min	1.39	1.43	1.54	1.48	1.40	1.39		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.39	1.40	1.61	1.26			1.61	$\rho = 0.9$
AIC	1.62	1.63	1.64	1.58				Oracle: 0.92
BIC	1.62	1.63	1.64	1.57				074666.0.72
CV.1se	4.92	4.92	4.93	5.99	4.92			
CV.min	4.92	4.94	4.97	7.11	4.96	4.96		$sd(\mu)/\sigma = 0.5$
AICc	4.87	5.98	7.74	5.20			7.74	$\rho = 0$
AIC	7.69	7.74	7.80	7.57				Oracle : 4.35
BIC	7.69	7.73	7.80	7.57				07 dete : 1.33
CV.1se	4.40	4.40	4.41	5.38	4.40			
CV.min	4.41	4.42	4.43	6.39	4.44	4.44		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.36	5.23	6.91	4.66			6.91	$\rho = 0.5$
AIC	6.87	6.91	6.97	6.77				Oracle : 3.90
BIC	6.87	6.91	6.97	6.76				3.4000.3.70
CV.1se	4.18	4.18	4.18	5.02	4.18			
CV.min	4.18	4.19	4.21	6.00	4.20	4.21		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.13	4.86	6.53	4.42			6.54	$\rho = 0.9$
AIC	6.50	6.54	6.59	6.40				<i>Oracle</i> : 3.69
BIC	6.50	6.53	6.59	6.39				

Table 20: Predictive MSE for n=100, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	1.47	1.35	1.90	0.84	1.13			
CV.min	0.91	0.88	1.34	0.86	0.87	0.87		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.06	0.83	0.97	0.86			0.97	$\rho = 0$
AIC	0.98	0.98	1.00	0.93				Oracle : 0.56
BIC	0.98	0.98	1.00	0.92				01 acte . 0.30
CV.1se	1.54	1.43	1.82	0.79	1.17			
CV.min	0.89	0.89	1.39	0.79	0.85	0.86		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.07	0.79	0.86	0.83			0.86	$\rho = 0.5$
AIC	0.88	0.88	0.89	0.84				Oracle : 0.50
BIC	0.88	0.88	0.89	0.84				Oracie: 0.30
CV.1se	1.50	1.40	1.78	0.76	1.18			
CV.min	0.87	0.90	1.37	0.76	0.84	0.85		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.05	0.79	0.81	0.82			0.82	$\rho = 0.9$
AIC	0.83	0.83	0.84	0.79				01049
BIC	0.83	0.83	0.84	0.79				Oracle: 0.48
CV.1se	3.93	3.96	4.00	3.22	3.93			
CV.min	3.41	3.65	3.89	3.67	3.44	3.45		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.43	3.42	3.99	3.09			3.99	$\rho = 0$
AIC	3.97	3.99	4.03	3.87				,
BIC	3.96	3.99	4.03	3.86				Oracle: 2.25
CV.1se	3.54	3.54	3.58	2.93	3.54			
CV.min	3.14	3.32	3.49	3.29	3.17	3.16		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.13	3.09	3.55	2.82			3.56	$\rho = 0.5$
AIC	3.54	3.56	3.59	3.46				,
BIC	3.54	3.55	3.59	3.45				Oracle: 2.01
CV.1se	3.34	3.36	3.38	2.77	3.33			
CV.min	2.98	3.15	3.30	3.08	3.00	3.00		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.98	2.94	3.35	2.68			3.34	$\rho = 0.9$
AIC	3.34	3.35	3.39	3.26				,
BIC	3.33	3.35	3.39	3.26				Oracle: 1.90
CV.1se	10.17	10.17	10.19	12.43	10.17			
CV.min	10.17	10.22	10.26	14.81	10.28	10.23		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	10.09	14.04	16.09	10.77			16.07	$\rho = 0$
AIC	15.93	16.04	16.16	15.68				,
BIC	15.92	16.03	16.16	15.66				Oracle: 9.00
CV.1se	9.09	9.10	9.11	11.13	9.10			
CV.min	9.13	9.13	9.16	13.22	9.18	9.18		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	9.02	12.34	14.33	9.64	7.10	7.10	14.32	$\rho = 0.5$
AIC	14.20	14.29	14.40	13.98			11.52	,
BIC	14.19	14.29	14.40	13.97				Oracle: 8.05
CV.1se	8.59	8.60	8.60	10.43	8.59			
CV.13C CV.min	8.62	8.64	8.65	12.40	8.66	8.71		$sd(\mu)/\sigma = 0.5$
AICc	8.52	11.58	13.53	9.14	0.00	0.71	13.53	$\rho = 0.9$
AICC	13.40	13.49	13.60	13.19			10.00	,
BIC	13.40	13.48	13.59	13.19				Oracle: 7.61
	13.37	13.40	13.37	15.10				

Table 21: Predictive MSE for n=100, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\;\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	1.64	1.52	2.13	0.93	1.27			
CV.min	1.01	0.98	1.54	0.96	0.97	0.98		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.18	0.92	1.08	0.96			1.08	$\rho = 0$
AIC	1.09	1.09	1.11	1.03				Oracle: 0.62
BIC	1.09	1.09	1.11	1.02				07466 . 0.02
CV.1se	1.73	1.61	2.07	0.88	1.31			
CV.min	1.00	1.00	1.58	0.88	0.95	0.96		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.19	0.86	0.96	0.92			0.96	$\rho = 0.5$
AIC	0.97	0.97	0.99	0.93				Oracle : 0.56
BIC	0.97	0.97	0.99	0.93				Oracle . 0.30
CV.1se	1.68	1.57	2.00	0.85	1.33			
CV.min	0.97	1.02	1.56	0.84	0.93	0.95		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.17	0.86	0.91	0.90			0.91	$\rho = 0.9$
AIC	0.92	0.92	0.93	0.88				Oracle : 0.53
BIC	0.92	0.92	0.93	0.88				Oracie: 0.55
CV.1se	4.37	4.39	4.44	3.57	4.36			
CV.min	3.79	4.08	4.32	4.07	3.83	3.85		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.81	3.81	4.44	3.44			4.44	$\rho = 0$
AIC	4.41	4.43	4.48	4.30				
BIC	4.40	4.43	4.48	4.29				Oracle: 2.50
CV.1se	3.93	3.94	3.97	3.25	3.93			
CV.min	3.50	3.70	3.89	3.66	3.54	3.54		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.48	3.43	3.95	3.13			3.95	$\rho = 0.5$
AIC	3.93	3.95	3.99	3.84				
BIC	3.93	3.95	3.99	3.84				Oracle: 2.23
CV.1se	3.72	3.74	3.76	3.08	3.71			
CV.min	3.31	3.52	3.68	3.43	3.34	3.34		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.32	3.26	3.73	2.98			3.73	$\rho = 0.9$
AIC	3.71	3.73	3.77	3.63				
BIC	3.71	3.73	3.77	3.63				Oracle: 2.11
CV.1se	11.29	11.30	11.32	13.82	11.30			
CV.min	11.31	11.36	11.41	16.47	11.43	11.40		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	11.21	15.81	17.90	11.99			17.88	$\rho = 0$
AIC	17.71	17.84	17.97	17.43				'
BIC	17.70	17.83	17.97	17.42				Oracle: 9.99
CV.1se	10.09	10.09	10.10	12.37	10.09			
CV.min	10.15	10.14	10.17	14.68	10.19	10.25		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	10	13.91	15.92	10.71			15.95	$\rho = 0.5$
AIC	15.76	15.87	15.99	15.52				,
BIC	15.76	15.86	15.99	15.51				Oracle: 8.94
CV.1se	9.54	9.55	9.56	11.59	9.54			
CV.rise CV.min	9.59	9.59	9.61	13.78	9.62	9.66		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	9.46	13.05	15.04	10.15	,.02	2.00	15.03	$\rho = 0.9$
AIC	14.89	14.99	15.10	14.65			15.05	
BIC	14.88	14.98	15.10	14.65				Oracle: 8.45
DIC	17.00	17.70	13.10	17.03				

Table 22: Predictive MSE for n=100, binary design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\;\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	1.73	1.60	2.24	0.98	1.33			
CV.min	1.07	1.04	1.63	1.01	1.03	1.02		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.24	0.96	1.14	1.01			1.14	$\rho = 0$
AIC	1.15	1.15	1.17	1.09				Oracle: 0.66
BIC	1.15	1.15	1.17	1.08				07 acic . 0.00
CV.1se	1.83	1.71	2.19	0.92	1.39			
CV.min	1.05	1.06	1.68	0.93	1.00	1.02		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.25	0.9	1.02	0.97			1.02	$\rho = 0.5$
AIC	1.03	1.03	1.04	0.98				Oracle: 0.59
BIC	1.03	1.03	1.04	0.98				Oracie: 0.39
CV.1se	1.77	1.66	2.11	0.89	1.41			
CV.min	1.02	1.08	1.65	0.89	0.99	1.01		$sd(\mu)/\sigma = 2$
AICc	1.24	0.90	0.96	0.95			0.96	$\rho = 0.9$
AIC	0.97	0.97	0.99	0.93				<i>Oracle</i> : 0.56
BIC	0.97	0.97	0.99	0.93				Oracie: 0.30
CV.1se	4.60	4.63	4.68	3.77	4.60			
CV.min	4.00	4.31	4.56	4.29	4.04	4.06		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.02	4.02	4.68	3.62			4.68	$\rho = 0$
AIC	4.64	4.67	4.72	4.53				-
BIC	4.64	4.67	4.72	4.52				Oracle: 2.63
CV.1se	4.15	4.16	4.20	3.44	4.15			
CV.min	3.69	3.92	4.11	3.86	3.73	3.75		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.68	3.62	4.18	3.31			4.18	$\rho = 0.5$
AIC	4.15	4.18	4.22	4.06				0 1 226
BIC	4.15	4.17	4.22	4.06				Oracle: 2.36
CV.1se	3.92	3.95	3.97	3.25	3.91			
CV.min	3.50	3.71	3.88	3.62	3.53	3.53		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.51	3.44	3.94	3.14			3.93	$\rho = 0.9$
AIC	3.91	3.94	3.97	3.83				0 1 222
BIC	3.91	3.93	3.97	3.82				Oracle: 2.23
CV.1se	11.92	11.93	11.95	14.58	11.93			
CV.min	11.93	11.99	12.04	17.34	12.05	12.01		$sd(\mu)/\sigma = 0.5$
AICc	11.84	16.71	18.88	12.64			18.88	$\rho = 0$
AIC	18.67	18.80	18.95	18.38				·
BIC	18.66	18.80	18.95	18.37				<i>Oracle</i> : 10.54
CV.1se	10.65	10.66	10.67	13.06	10.65			
CV.min	10.72	10.71	10.73	15.50	10.77	10.78		$sd(\mu)/\sigma = 0.5$
AICc	10.57	14.75	16.82	11.29			16.83	$\rho = 0.5$
AIC	16.65	16.76	16.89	16.39				,
BIC	16.64	16.75	16.89	16.38				Oracle: 9.44
CV.1se	10.06	10.07	10.07	12.21	10.06			
CV.min	10.12	10.13	10.12	14.51	10.13	10.21		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	9.97	13.86	15.85	10.70			15.87	$\rho = 0.9$
AIC	15.69	15.79	15.92	15.44				•
BIC	15.68	15.79	15.91	15.43				Oracle: 8.92
	15.00	10.17	10.71	10.10				

Table 23: Predictive MSE for n=100, continuous design, sparse covariates, and decay 10.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min					1.61	1.65		$\operatorname{sd}(\mu)/\sigma = 2$
BIC 1.89 1.89 1.92 1.77					1.63			1.85	$\rho = 0$
BIC 1.89 1.89 1.92 1.17 1.18									$Oracle \cdot 1.09$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	1.89	1.89		1.77				07 acic . 1.07
AICc 1.32 1.51 0.95 1.00 1.08 $\rho = 0.5$ AIC 0.75 0.75 0.76 0.76 0.73 $\rho = 0.5$ AIC 0.75 0.75 0.76 0.85 $\rho = 0.5$ Oracle : 0.43 $\rho = 0.5$ Oracle : 0.44 $\rho = 0.5$ Oracle : 0.41 $\rho = 0.5$ Oracle : 0.42 $\rho = 0.5$ Oracle : 0.43 $\rho = 0.5$ Oracle : 0.45 $\rho = 0.5$ Oracle : 0.		1.76	1.68	1.59	0.92	1.46			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	1.27		1.37	0.75	1.13	1.22		
BIC 0.75 0.75 0.76 0.85 Oracle : 0.43 CV.Ise 0.38 0.36 0.32 0.26 0.33 $cc{0.39}$ $cc{0.29}$ 0.29 0.29 0.28 0.28 $cc{0.29}$ $cc{0.29}$ $cc{0.29}$ 0.29 $cc{0.29}$ 0.29 $cc{0.29}$	AICc	1.32	1.51	0.95	1.00			1.08	$\rho = 0.5$
BIC 0.75 0.76 0.85 CV.Isie 0.38 0.36 0.32 0.26 0.33 0.28 sd(μ)/σ = 2 AICc 0.29 0.29 0.29 0.20 0.28 0.28 sd(μ)/σ = 2 AICc 0.19 0.19 0.20 0.18 0.29 0.29 ρ = 0.9 AIC 0.19 0.19 0.20 0.30 0.29 ρ = 0.9 CV.lse 7.53 7.48 7.59 6.10 7.45 0.745 CV.min 6.40 6.61 7.19 6.97 6.46 6.47 sd(μ)/σ = 1 AIC 6.55 7.08 7.66 5.83 7.24 ρ = 0 AIC 7.67 7.71 7.80 7.42 0racle : 4.37 CV.lse 3.04 3.03 3.00 2.54 3.00 CV.min 2.76 2.79 2.88 2.75 2.75 2.74 sd(μ)/σ = 1 AIC 3.01 3.02 <td< td=""><td>AIC</td><td>0.75</td><td>0.75</td><td>0.76</td><td>0.73</td><td></td><td></td><td></td><td>$O_{magle} \cdot 0.43$</td></td<>	AIC	0.75	0.75	0.76	0.73				$O_{magle} \cdot 0.43$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.75	0.75	0.76	0.85				Oracle . 0.43
AICc 0.29 0.33 0.32 0.22 0.29 $\rho = 0.9$ AIC 0.19 0.19 0.20 0.18 BIC 0.20 0.20 0.20 0.30 $\rho = 0.9$ AIC 0.19 0.19 0.20 0.30 $\rho = 0.9$ AIC 0.20 0.20 0.20 0.20 0.20 0.30 $\rho = 0.9$ AIC 0.29 0.20 0.30 0.30 0.254 0.30 $\rho = 0.9$ AIC 0.27 0.29 0.28 0.29 0.27 0.28 0.29 0.29 0.28 0.29 0.29 0.29 0.29 0.29 0.29 0.29 0.29	CV.1se	0.38	0.36	0.32	0.26	0.33			
AIC 0.19 0.19 0.20 0.20 0.30	CV.min	0.29	0.29	0.29	0.20	0.28	0.28		
BIC 0.20 0.20 0.20 0.30	AICc	0.29	0.33	0.32	0.22			0.29	$\rho = 0.9$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	AIC	0.19	0.19	0.20	0.18				$O_{magle} \cdot 0.11$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.20	0.20	0.20	0.30				Oracle . 0.11
AICc 6.35 7.08 7.66 5.83 7.45 $\rho = 0$ AIC 7.68 7.71 7.80 7.45 $\rho = 0$ AIC 7.67 7.71 7.80 7.42 $\rho = 0$ BIC 7.67 7.71 7.80 7.42 $\rho = 0$ CV.lse 3.04 3.03 3.00 2.54 3.00 $\rho = 0$ CV.min 2.76 2.79 2.88 2.75 2.75 2.74 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 $\rho = 0.5$ BIC 3.00 3.01 3.04 2.92 $\rho = 0.5$ CV.lse 0.76 0.74 0.68 0.65 0.71 $\rho = 0.5$ AIC 0.64 0.68 0.66 0.61 0.64 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 $\rho = 0.9$ AIC 19.79 19.80 19.81 23.84 19.80 $\rho = 0.9$ AIC 30.82 30.99 31.25 30.32 $\rho = 0.5$ AIC 30.82 30.99 31.25 30.32 $\rho = 0.5$ AIC 30.81 30.98 31.25 30.30 $\rho = 0.5$ AIC 7.68 7.76 7.76 7.77 9.11 7.76 $\rho = 0.5$ AIC 7.68 7.76 7.76 7.77 9.11 7.76 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 $\rho = 0.5$ AIC 1.208 12.13 12.24 11.88 $\rho = 0.5$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$	CV.1se	7.53	7.48	7.59	6.10	7.45			
AIC 7.68 7.71 7.80 7.45 $Oracle: 4.37$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.39$ $Oracle: 4$	CV.min	6.40	6.61	7.19	6.97	6.46	6.47		$\operatorname{sd}(\mu)/\sigma = 1$
BIC 7.67 7.71 7.80 7.42 Oracle : 4.37 CV.1se 3.04 3.03 3.00 2.54 3.00 $sd(\mu)/\sigma = 1$ AICc 2.72 2.92 2.94 2.47 2.85 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 Oracle : 1.71 CV.1se 0.76 0.74 0.68 0.65 0.71 CV.min 0.65 0.64 0.63 0.62 0.63 0.63 $sd(\mu)/\sigma = 1$ AICc 0.78 0.78 0.80 0.71 0.64	AICc	6.35	7.08	7.66	5.83			7.24	$\rho = 0$
BIC 7.67 7.71 7.80 7.42 CV.1se 3.04 3.03 3.00 2.54 3.00 CV.min 2.76 2.79 2.88 2.75 2.75 2.74 $sd(\mu)/\sigma = 1$ AIC 2.72 2.92 2.94 2.47 2.85 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 Oracle: 1.71 CV.1se 0.76 0.74 0.68 0.65 0.71 Occupant CV.min 0.65 0.64 0.63 0.62 0.63 0.63 $sd(\mu)/\sigma = 1$ AIC 0.78 0.78 0.80 0.71 Oracle: 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 19.92 $sd(\mu)/\sigma = 0.5$ AIC 19.54 20.74 31.03 20.74 28.50 $\rho = 0$ AIC 19.54 20.74 31.03 20.74 28.50 $\rho = 0.5$ AIC 30.82 30.99 31.25	AIC	7.68	7.71	7.80	7.45				Oma ala . 4 27
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	7.67	7.71	7.80	7.42				Oracie: 4.37
AICc 2.72 2.92 2.94 2.47 2.85 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 $Oracle : 1.71$ $Oracle : 1.$	CV.1se	3.04	3.03	3.00	2.54	3.00			
AIC 3.01 3.02 3.05 2.93 $Oracle : 1.71$ BIC 3.00 3.01 3.04 2.92 $Oracle : 1.71$ CV.1se 0.76 0.74 0.68 0.65 0.71 $Oracle : 1.71$ CV.min 0.65 0.64 0.63 0.62 0.63 0.63 $Oracle : 1.71$ AICc 0.64 0.68 0.66 0.61 0.64 $Oracle : 0.45$ BIC 0.78 0.78 0.80 0.71 $Oracle : 0.45$ CV.1se 19.79 19.80 19.81 23.84 19.80 $Oracle : 0.45$ CV.min 19.76 19.83 19.97 28.51 19.86 19.92 $Oracle : 0.45$ AICc 19.54 20.74 31.03 20.74 28.50 $Oracle : 17.46$ BIC 30.81 30.98 31.25 30.32 $Oracle : 17.46$ CV.1se 7.76 7.77 9.11 7.76 $Oracle : 17.46$ CV.1se 7.76 7.77 7.81 10.85 7.79 7.80 $Oracle : 17.46$ AIC 12.08 12.13 12.24 11.88 $Oracle : 1.71$ BIC 12.07 12.12 12.23 11.86 $Oracle : 1.71$	CV.min	2.76	2.79	2.88	2.75	2.75	2.74		$\operatorname{sd}(\mu)/\sigma = 1$
BIC 3.00 3.01 3.04 2.92	AICc	2.72	2.92	2.94	2.47			2.85	$\rho = 0.5$
BIC 3.00 3.01 3.04 2.92 CV.1se 0.76 0.74 0.68 0.65 0.71 CV.min 0.65 0.64 0.63 0.62 0.63 0.63 AICc 0.64 0.68 0.66 0.61 0.64 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 0.64 0.62 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 19.92 sd(μ)/ $\sigma = 0.5$ AICc 19.54 20.74 31.03 20.74 28.50 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 0.74 28.50 $\rho = 0$ BIC 30.81 30.98 31.25 30.30 0.72 0.72 0.72 CV.1se 7.76 7.76 7.77 9.11 7.76 7.80 sd(μ)/ $\sigma = 0.5$ AIC 12.08 12.13 12.24 11.88 10.37 $\rho = 0.5$ AI	AIC	3.01	3.02	3.05	2.93				Omada i 1 71
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	3.00	3.01	3.04	2.92				Oracie: 1.71
AICc 0.64 0.68 0.66 0.61 0.64 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 BIC 0.78 0.78 0.80 0.64 $\rho = 0.9$ Oracle : 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.min 19.76 19.83 19.97 28.51 19.86 19.92 $\rho = 0.5$ AICc 19.54 20.74 31.03 20.74 28.50 $\rho = 0.5$ AIC 30.82 30.99 31.25 30.32 BIC 30.81 30.98 31.25 30.30 $\rho = 0.5$ AICc 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 7.80 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 CV.1se 2.04 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.00 2.02 2.23 2.00 2.01 $\rho = 0.5$ AIC 1.98 2.01 2.75 2.08 $\rho = 0.5$ AIC 3.16 3.17 3.21 3.02 $\rho = 0.5$ AIC 1.80 $\rho = 0.5$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.5$ AIC 1.98 2.01 3.17 3.21 3.02 $\rho = 0.5$	CV.1se	0.76	0.74	0.68	0.65	0.71			
AIC 0.78 0.78 0.78 0.80 0.71	CV.min	0.65	0.64	0.63	0.62	0.63	0.63		$\operatorname{sd}(\mu)/\sigma = 1$
BIC 0.78 0.78 0.80 0.64 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.min 19.76 19.83 19.97 28.51 19.86 19.92 $sd(\mu)/\sigma = 0.5$ AICc 19.54 20.74 31.03 20.74 28.50 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 EV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 7.80 AIC 12.08 12.13 12.24 11.88 0racle: 6.84 BIC 12.07 12.12 12.23 11.86 0racle: 6.84 CV.1se 2.04 2.04 2.02 2.04 2.01 $sd(\mu)/\sigma = 0.5$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	AICc	0.64	0.68	0.66	0.61			0.64	$\rho = 0.9$
BIC 0.78 0.78 0.80 0.64 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.min 19.76 19.83 19.97 28.51 19.86 19.92 $sd(\mu)/\sigma = 0.5$ AICc 19.54 20.74 31.03 20.74 28.50 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 EV.1se 7.76 7.76 7.77 9.11 7.76 CV.ise 7.76 7.77 7.81 10.85 7.79 7.80 sd(μ)/ σ = 0.5 AIC 12.08 12.13 12.24 11.88 Dracle: 6.84 EV.1se 2.04 2.04 2.02 2.04 CV.ise 2.04 2.04 2.02 2.04 CV.ise 2.04 2.02 2.23 2.00 2.01 sd(μ)/ σ = 0.5 AIC 1.98 2.01 2.75 2.08 2.01 ρ = 0.9	AIC	0.78	0.78	0.80	0.71				Oma ala + 0.45
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.78	0.78	0.80	0.64				Oracie: 0.43
AICc 19.54 20.74 31.03 20.74 28.50 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 BIC 30.81 30.98 31.25 30.30 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 7.80 $sd(\mu)/\sigma = 0.5$ AICc 7.68 7.76 12.06 8.19 10.37 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 CV.1se 2.04 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AICc 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	CV.1se	19.79	19.80	19.81	23.84	19.80			
AIC 30.82 30.99 31.25 30.32 $Oracle: 17.46$ BIC 30.81 30.98 31.25 30.30 $Oracle: 17.46$ CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 7.80 $sd(\mu)/\sigma = 0.5$ AIC 12.08 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 $Oracle: 6.84$ CV.1se 2.04 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 $Oracle: 1.80$	CV.min	19.76	19.83	19.97	28.51	19.86	19.92		$sd(\mu)/\sigma = 0.5$
BIC 30.81 30.98 31.25 30.30 Oracle: 17.46 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 7.80 $sd(\mu)/\sigma = 0.5$ AICc 7.68 7.76 12.06 8.19 10.37 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 0racle: 6.84 BIC 12.07 12.12 12.23 11.86 0racle: 6.84 CV.1se 2.04 2.04 2.02 2.04 2.01 $sd(\mu)/\sigma = 0.5$ AIC 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 0racle: 1.80	AICc	19.54	20.74	31.03	20.74			28.50	$\rho = 0$
BIC 30.81 30.98 31.25 30.30 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 7.80 $sd(\mu)/\sigma = 0.5$ AIC 7.68 7.76 12.06 8.19 10.37 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 0racle: 1.80	AIC	30.82	30.99	31.25	30.32				Oma ala . 17 46
CV.min 7.76 7.77 7.81 10.85 7.79 7.80 $sd(\mu)/\sigma = 0.5$ AIC 7.68 7.76 12.06 8.19 10.37 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 Oracle : 6.84 BIC 12.07 12.12 12.23 11.86 Oracle : 6.84 CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 2.01 sd(μ)/ σ = 0.5 AIC 3.16 3.17 3.21 3.02 Oracle : 1.80	BIC	30.81	30.98	31.25	30.30				Oracie: 17.40
AICc 7.68 7.76 12.06 8.19 10.37 $ρ = 0.5$ AIC 12.08 12.13 12.24 11.88 $Oracle : 6.84$ BIC 12.07 12.12 12.23 11.86 $Oracle : 6.84$ CV.1se 2.04 2.04 2.04 2.02 2.04 $Oracle : 6.84$ CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $Oracle : 6.84$ AICc 1.98 2.01 2.75 2.08 2.01 $Oracle : 1.80$ AIC 3.16 3.17 3.21 3.02 $Oracle : 1.80$	CV.1se	7.76	7.76	7.77	9.11	7.76			
AIC 12.08 12.13 12.24 11.88 Oracle : 6.84 BIC 12.07 12.12 12.23 11.86 Oracle : 6.84 CV.1se 2.04 2.04 2.02 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 0racle : 1.80	CV.min	7.76	7.77	7.81	10.85	7.79	7.80		$sd(\mu)/\sigma = 0.5$
BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AICc 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 Oracle: 1.80	AICc	7.68	7.76	12.06	8.19			10.37	$\rho = 0.5$
BIC 12.07 12.12 12.23 11.86 CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 2.01 $\rho = 0.9$	AIC	12.08	12.13	12.24	11.88				Oma ala . 6 94
CV.min 2.00 2.00 2.02 2.23 2.00 2.01 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 2.01 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 $oracle: 1.80$	BIC	12.07	12.12	12.23	11.86				Oracie: 0.84
AICc 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	CV.1se	2.04	2.04	2.04	2.02	2.04			
AICc 1.98 2.01 2.75 2.08 2.01 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	CV.min	2.00	2.00	2.02	2.23	2.00	2.01		$\operatorname{sd}(\mu)/\sigma = 0.5$
Uracle: 1 XII	AICc	1.98	2.01	2.75	2.08			2.01	
Uracle: 1 XII		3.16		3.21					
	BIC	3.16	3.17	3.21	2.43				Oracie: 1.80

Table 24: Predictive MSE for n=100, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}~\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	6.03	5.47	7.37	3.39	4.50			
CV.min	3.66	3.54	5.12	3.45	3.45	3.51		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.24	3.93	3.83	3.46			3.86	$\rho = 0$
AIC	3.93	3.94	4.01	3.72				Oracle: 2.26
BIC	3.93	3.94	4.00	3.71				Oracle . 2.20
CV.1se	3.71	3.68	3.68	1.86	3.59			
CV.min	2.90	3.04	3.39	1.52	2.83	2.85		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	2.94	3.45	1.54	2.11			2.14	$\rho = 0.5$
AIC	1.51	1.51	1.53	1.48				Oracle: 0.86
BIC	1.51	1.51	1.53	1.51				01 acte . 0.80
CV.1se	0.76	0.73	0.66	0.55	0.64			
CV.min	0.55	0.55	0.57	0.41	0.54	0.54		$sd(\mu)/\sigma = 2$
AICc	0.56	0.68	0.61	0.47			0.56	$\rho = 0.9$
AIC	0.34	0.34	0.34	0.33				Oracle: 0.19
BIC	0.34	0.34	0.34	0.55				Oracie: 0.19
CV.1se	15.86	15.92	16.11	12.87	15.83			-
CV.min	13.74	14.70	15.65	14.59	13.88	13.91		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	13.72	15.18	16.02	12.39			15.45	$\rho = 0$
AIC	15.92	16.01	16.18	15.51				0 1 0.05
BIC	15.91	16.00	16.18	15.49				Oracle: 9.05
CV.1se	6.15	6.15	6.15	5.16	6.14			
CV.min	5.74	5.87	6.06	5.58	5.74	5.75		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.67	6.04	6.02	5.09			5.91	$\rho = 0.5$
AIC	6.05	6.07	6.13	5.93				0 1 2.42
BIC	6.05	6.07	6.13	5.92				Oracle: 3.43
CV.1se	1.38	1.37	1.35	1.20	1.34			
CV.min	1.24	1.24	1.28	1.13	1.21	1.21		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.22	1.34	1.32	1.13			1.21	$\rho = 0.9$
AIC	1.36	1.37	1.38	1.30				0 1 0.70
BIC	1.36	1.36	1.38	1.25				Oracle: 0.78
CV.1se	41.10	41.10	41.16	49.82	41.10			
CV.min	41.17	41.36	41.49	59.63	41.39	41.46		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	40.65	49.38	64.74	43.30			59.90	$\rho = 0$
AIC	64.05	64.49	65.00	63.04				·
BIC	64.02	64.47	64.99	63.01				<i>Oracle</i> : 36.24
CV.1se	15.53	15.54	15.54	18.34	15.53			
CV.min	15.56	15.59	15.65	21.83	15.63	15.68		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	15.41	15.84	24.32	16.43			21.33	$\rho = 0.5$
AIC	24.20	24.32	24.53	23.82				,
BIC	24.18	24.31	24.52	23.81				<i>Oracle</i> : 13.70
CV.1se	3.54	3.54	3.54	3.58	3.54			
CV.min	3.52	3.54	3.55	3.95	3.53	3.54		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	3.49	3.53	5.40	3.67			3.57	$\rho = 0.9$
AIC	5.47	5.49	5.56	5.28			2.0,	
BIC	5.46	5.49	5.56	4.57				Oracle: 3.12
	2.10	5.17	2.20					

Table 25: Predictive MSE for n=100, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$		AL	MCP	CVbest	ICbest	
CV.1se	6.74	6.11	8.34	3.77	5.04			
CV.min	4.07	3.93	5.96	3.83	3.85	3.91		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.70	4.30	4.30	3.84			4.30	$\rho = 0$
AIC	4.38	4.39	4.46	4.14				Oracle: 2.52
BIC	4.37	4.39	4.46	4.13				07 acic . 2.32
CV.1se	4.12	4.10	4.10	2.07	4.02			
CV.min	3.23	3.39	3.79	1.69	3.19	3.20		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.30	3.84	1.71	2.35			2.40	$\rho = 0.5$
AIC	1.67	1.68	1.70	1.64				Oracle: 0.95
BIC	1.67	1.68	1.70	1.69				01 acie . 0.93
CV.1se	0.84	0.81	0.74	0.61	0.71			
CV.min	0.61	0.61	0.63	0.46	0.60	0.60		$sd(\mu)/\sigma = 2$
AICc	0.62	0.75	0.66	0.51			0.62	$\rho = 0.9$
AIC	0.37	0.37	0.38	0.36				Oracle: 0.21
BIC	0.37	0.38	0.38	0.59				Oracie: 0.21
CV.1se	17.65	17.73	17.88	14.30	17.57			
CV.min	15.29	16.38	17.43	16.22	15.41	15.43		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	15.27	16.82	17.83	13.78			17.13	$\rho = 0$
AIC	17.69	17.80	17.98	17.24				0110.05
BIC	17.68	17.79	17.98	17.21				Oracle: 10.05
CV.1se	6.83	6.83	6.83	5.74	6.82			
CV.min	6.38	6.54	6.74	6.19	6.38	6.39		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.30	6.72	6.70	5.66			6.54	$\rho = 0.5$
AIC	6.71	6.74	6.80	6.59				0 1 200
BIC	6.71	6.73	6.80	6.58				Oracle: 3.80
CV.1se	1.53	1.52	1.50	1.33	1.49			
CV.min	1.37	1.37	1.43	1.25	1.35	1.35		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.35	1.49	1.45	1.25			1.35	$\rho = 0.9$
AIC	1.50	1.51	1.53	1.44				0 1 006
BIC	1.50	1.51	1.53	1.40				Oracle: 0.86
CV.1se	45.57	45.59	45.62	55.20	45.57			
CV.min	45.65	45.85	45.98	66.11	45.94	46.01		$sd(\mu)/\sigma = 0.5$
AICc	45.06	56.09	71.78	48.00			66.96	$\rho = 0$
AIC	70.97	71.48	72.03	69.85				0 1 40 10
BIC	70.94	71.46	72.01	69.82				Oracle: 40.18
CV.1se	17.26	17.26	17.27	20.38	17.26			
CV.min	17.28	17.32	17.40	24.29	17.37	17.39		$sd(\mu)/\sigma = 0.5$
AICc	17.13	17.71	27.06	18.28			23.99	$\rho = 0.5$
AIC	26.90	27.05	27.27	26.48				0 1 15 22
BIC	26.89	27.04	27.27	26.47				<i>Oracle</i> : 15.23
CV.1se	3.90	3.90	3.90	3.96	3.90			
CV.min	3.89	3.90	3.92	4.37	3.90	3.92		$sd(\mu)/\sigma = 0.5$
AICc	3.86	3.90	5.99	4.06			4.01	$\rho = 0.9$
AIC	6.03	6.06	6.14	5.83				•
	0.05	0.00	0.11	5.05				Oracle: 3.44

Table 26: Predictive MSE for n=100, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$		AL	MCP	CVbest	ICbest	
CV.1se	7.14	6.46	8.81	3.97	5.31			
CV.min	4.29	4.15	6.14	4.04	4.07	4.12		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.01	4.53	4.53	4.04			4.51	$\rho = 0$
AIC	4.62	4.63	4.71	4.36				Oracle: 2.65
BIC	4.61	4.62	4.70	4.35				Oracie . 2.03
CV.1se	4.35	4.31	4.32	2.18	4.24			
CV.min	3.40	3.59	4.01	1.78	3.37	3.37		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.48	4.06	1.81	2.47			2.54	$\rho = 0.5$
AIC	1.77	1.77	1.79	1.73				Oracle: 1.00
BIC	1.77	1.77	1.79	1.79				Oracie: 1.00
CV.1se	0.89	0.85	0.78	0.65	0.75			
CV.min	0.64	0.64	0.67	0.49	0.63	0.63		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.66	0.79	0.69	0.54			0.66	$\rho = 0.9$
AIC	0.39	0.40	0.40	0.38				01022
BIC	0.39	0.40	0.40	0.62				Oracle: 0.23
CV.1se	18.66	18.75	18.91	15.12	18.55			
CV.min	16.14	17.34	18.41	17.11	16.33	16.36		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	16.16	17.75	18.84	14.55			18.25	$\rho = 0$
AIC	18.68	18.80	18.99	18.21				,
BIC	18.67	18.79	18.99	18.18				Oracle: 10.62
CV.1se	7.19	7.19	7.19	6.05	7.19			
CV.min	6.72	6.89	7.10	6.52	6.72	6.74		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.63	7.07	7.06	5.96			6.89	$\rho = 0.5$
AIC	7.07	7.10	7.17	6.94				, , , , , , ,
BIC	7.07	7.10	7.17	6.93				Oracle: 4.01
CV.1se	1.61	1.60	1.58	1.40	1.56			
CV.min	1.45	1.45	1.50	1.32	1.42	1.42		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.42	1.57	1.53	1.32			1.43	$\rho = 0.9$
AIC	1.59	1.59	1.61	1.52				,
BIC	1.58	1.59	1.61	1.47				Oracle: 0.91
CV.1se	48.12	48.15	48.19	58.23	48.13			
CV.min	48.20	48.43	48.57	69.84	48.51	48.58		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	47.6	59.96	75.78	50.67			70.76	$\rho = 0$
AIC	74.93	75.47	76.04	73.75				,
BIC	74.89	75.44	76.03	73.72				<i>Oracle</i> : 42.43
CV.1se	18.22	18.22	18.23	21.49	18.22			
CV.min	18.26	18.28	18.35	25.58	18.33	18.34		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	18.08	18.83	28.56	19.27			24.76	$\rho = 0.5$
AIC	28.38	28.53	28.78	27.94				,
BIC	28.36	28.52	28.77	27.92				Oracle: 16.07
CV.1se	4.11	4.11	4.11	4.17	4.11			
CV.rise CV.min	4.10	4.11	4.14	4.61	4.11	4.13		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.07	4.11	6.32	4.28		1.10	4.19	$\rho = 0.9$
AIC	6.36	6.39	6.47	6.14			,	,
BIC	6.36	6.39	6.47	5.28				Oracle: 3.62
DIC	0.50	0.57	0.77	3.20				

Table 27: Predictive MSE for n=1000, binary design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	0.34	0.34	0.33	0.33	0.32			
CV.min	0.32	0.32	0.31	0.32	0.31	0.31		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.32	0.32	0.31	0.32			0.31	$\rho = 0$
AIC	0.42	0.42	0.45	0.32				Oracle: 0.30
BIC	0.35	0.34	0.32	0.33				07466.0.50
CV.1se	0.31	0.30	0.29	0.30	0.29			
CV.min	0.29	0.29	0.28	0.29	0.28	0.28		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.29	0.29	0.28	0.29			0.28	$\rho = 0.5$
AIC	0.37	0.38	0.40	0.29				Oracle : 0.26
BIC	0.32	0.31	0.29	0.30				Oracle : 0.20
CV.1se	0.29	0.29	0.28	0.28	0.27			
CV.min	0.28	0.27	0.26	0.27	0.26	0.26		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.28	0.27	0.26	0.27			0.26	$\rho = 0.9$
AIC	0.35	0.35	0.37	0.27				Oma ala . 0.25
BIC	0.30	0.29	0.27	0.28				Oracle: 0.25
CV.1se	1.34	1.32	1.29	1.25	1.27			
CV.min	1.26	1.25	1.23	1.28	1.23	1.23		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.26	1.25	1.27	1.27			1.26	$\rho = 0$
AIC	1.85	1.87	2.00	1.31				·
BIC	1.35	1.31	1.28	1.27				Oracle: 1.17
CV.1se	1.21	1.18	1.15	1.12	1.13			
CV.min	1.14	1.12	1.1	1.15	1.1	1.10		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.14	1.12	1.13	1.13			1.13	$\rho = 0.5$
AIC	1.65	1.67	1.78	1.18				·
BIC	1.22	1.18	1.15	1.14				Oracle: 1.05
CV.1se	1.14	1.12	1.09	1.06	1.07			
CV.min	1.08	1.06	1.04	1.08	1.04	1.05		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.08	1.06	1.07	1.08			1.07	$\rho = 0.9$
AIC	1.55	1.57	1.68	1.11				·
BIC	1.16	1.12	1.09	1.09				Oracle: 0.99
CV.1se	5.21	5.16	5.11	4.90	5.07			
CV.min	4.93	4.89	4.90	5.20	4.89	4.89		$sd(\mu)/\sigma = 0.5$
AICc	4.92	4.89	5.17	5.08			4.97	$\rho = 0$
AIC	7.90	8.06	8.55	6.07				·
BIC	5.13	5.09	5.21	4.95				Oracle: 4.66
CV.1se	4.68	4.62	4.57	4.39	4.53			
CV.min	4.42	4.38	4.38	4.67	4.37	4.38		$sd(\mu)/\sigma = 0.5$
AICc	4.41	4.38	4.62	4.55			4.47	$\rho = 0.5$
AIC	7.06	7.19	7.62	5.44				,
BIC	4.62	4.57	4.64	4.46				Oracle: 4.16
CV.1se	4.43	4.38	4.33	4.17	4.28			
CV.rise CV.min	4.18	4.15	4.16	4.40	4.14	4.15		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.18	4.15	4.38	4.31			4.23	$\rho = 0.9$
AIC	6.66	6.78	7.20	5.08			1.23	
BIC	4.39	4.34	4.41	4.23				Oracle: 3.93
	т.Э./	T.JT	⊤ .⊤1	7.43				

Table 28: Predictive MSE for n=1000, binary design, dense covariates, and decay 50.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	2.22	2.18	2.18	2.15	2.10				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min					2.01	2.04			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$								2.04	$\rho = 0$	
BIC 2.82 2.60 2.38 2.47 2.44 2.48 1.95 1.95 1.88 2.47 2.44 2.48 1.95 1.95 1.88 2.48	AIC	2.52	2.56	2.73	2.07				Oracle : 1.77	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	2.82	2.60	2.38	2.47				Oracle . 1.77	
AICc 1.93 1.85 1.82 1.89 1.82 $\rho = 0.5$ AIC 2.25 2.28 2.43 1.87 $\rho = 0.5$ BIC 2.63 2.38 2.13 2.27 $\rho = 0.5$ CV.1se 1.87 1.84 1.83 1.85 1.77 $\rho = 0.5$ AIC 2.17 1.75 1.71 1.72 1.77 1.69 1.72 $\rho = 0.9$ AIC 2.11 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.11 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.11 2.14 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.11 2.14 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.11 2.14 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.11 2.14 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.10 2.17 2.18 8.32 $\rho = 0.9$ AIC 2.10 2.19 11.60 8.54 7.80 8.32 $\rho = 0.9$ AIC 10.67 10.91 11.60 8.52 $\rho = 0.9$ AIC 10.67 10.91 11.60 8.52 $\rho = 0.9$ AIC 10.66 9.64 10.63 8.90 $\rho = 0.9$ AIC 2.11 6.95 7.54 7.05 7.34 $\rho = 0.5$ AIC 7.11 6.95 7.54 7.01 7.75 $\rho = 0.5$ AIC 7.11 6.95 7.54 7.01 7.75 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 BIC 9.75 8.86 9.954 8.14 $\rho = 0.5$ AIC 8.92 9.11 9.68 7.18 BIC 9.29 8.44 9.08 7.77 $\rho = 0.5$ AIC 8.92 9.11 9.68 7.18 BIC 9.29 8.44 9.08 7.77 $\rho = 0.5$ AIC 4.19 45.58 47.69 36.58 BIC 30.49 30.51 30.62 28.92 30.45 $\rho = 0.9$ AIC 4.19 45.58 47.69 36.58 BIC 30.59 30.57 30.65 30.31 $\rho = 0.5$ AIC 2.57 25.89 2.90.2 26.38 29.00 $\rho = 0.5$ AIC 2.57 25.89 2.90.2 26.38 29.00 $\rho = 0.5$ AIC 2.57 25.89 2.90.2 26.38 25.96 $\rho = 0.5$ AIC 2.57 25.89 2.90.2 26.38 25.96 $\rho = 0.5$ AIC 3.92 4.44 2.30 32.78 BIC 2.71 7.71 1.71 27.16 27.20 26.98 $\rho = 0.5$ AIC 2.432 24.42 27.06 24.49 25.56 $\rho = 0.5$ AIC 2.432 24.42 27.06 24.49 $\rho = 0.5$ AIC 2.432 24.42 27.06 24.49 $\rho = 0.5$ AIC 2.433 24.44 27.06 24.49 $\rho = 0.5$ AIC 2.432 24.42 27.06 24.49 $\rho = 0.5$ AIC 2.433 24.42 27.06 24.49 $\rho = 0.5$ AIC 2.433 24.44 27.06 24.49 25.56 $\rho = 0.5$ AIC 2.433 24.44 27.06 24.49 25.56 $\rho = 0.5$ AIC 2.433 24.44 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.49 27.06 24.		1.99	1.96	1.95	1.95	1.88				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	1.85	1.82	1.83	1.87	1.79	1.82		$\operatorname{sd}(\mu)/\sigma = 2$	
BIC 2.63 2.38 2.13 2.27 Oracle : 1.57 CV. Ise 1.87 1.84 1.83 1.85 1.77 1.69 1.72 $sd(\mu)/\sigma = 2$ $sd(\mu)/\sigma = 2$ AICe 1.82 1.75 1.71 1.79 1.71 $\rho = 0.9$ AIC 2.11 2.14 2.28 1.77 $\rho = 0.9$ $\rho = 0.9$ CV.1se 8.48 8.43 8.71 7.83 8.19 $\rho = 0.9$ CV.nin 7.81 7.79 8.13 7.85 7.79 7.81 $sd(\mu)/\sigma = 1$ AIC 7.91 7.76 8.54 7.80 8.32 $\rho = 0$ AIC 10.67 10.91 11.60 8.52 $\rho = 0$ $\rho = 0$ AIC 10.67 10.91 11.60 8.52 $\rho = 0$ $\rho = 0$ V.V.1se 7.64 7.56 7.75 7.05 7.34 $\rho = 0$ CV.nie 7.64 7.56 7.75 7.05 7.34 $\rho = 0$	AICc	1.93	1.85	1.82	1.89			1.82	$\rho = 0.5$	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	AIC	2.25	2.28	2.43	1.87				Ongolo : 1.57	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	2.63	2.38	2.13	2.27				Oracie . 1.57	
AICc 1.82 1.75 1.71 1.79 1.71 $\rho = 0.9$ AIC 2.11 2.14 2.28 1.77 $\rho = 0.9$ AIC 2.50 2.27 2.00 2.16 $\rho = 0.9$ AIC $\rho = 0.9$ AIC 10.67 10.91 11.60 8.52 $\rho = 0.9$ AIC 10.67 10.91 11.60 8.52 $\rho = 0.9$ AIC 10.46 9.64 10.63 8.90 $\rho = 0.9$ AIC 2.11 6.95 7.54 7.05 7.34 $\rho = 0.9$ AIC 7.11 6.95 7.54 7.01 7.47 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 $\rho = 0.5$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.9$ AIC 8.91 29.91 8.44 9.08 7.77 $\rho = 0.9$ AIC 2.891 29.51 30.38 30.23 28.94 29.01 $\rho = 0.9$ AIC 4.19 45.58 47.69 36.58 $\rho = 0.9$ AIC 4.19 45.58 47.69 36.58 $\rho = 0.9$ AIC 4.19 45.58 47.69 36.58 $\rho = 0.9$ AIC 2.8.81 29.04 32.33 29.50 29.02 $\rho = 0.9$ AIC 3.9.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $\rho = 0.5$ AIC 24.45 24.87 25.89 25.48 25.45 24.47 24.52 $\rho = 0.9$ AIC 24.43 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.43 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 24.33 38.04 39.80 30.65	CV.1se	1.87	1.84	1.83	1.85	1.77				
AIC 2.11 2.14 2.28 1.77 BIC 2.50 2.27 2.00 2.16	CV.min	1.75	1.71	1.72	1.77	1.69	1.72		$\operatorname{sd}(\mu)/\sigma = 2$	
BIC 2.50 2.27 2.00 2.16	AICc	1.82	1.75	1.71	1.79			1.71	$\rho = 0.9$	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AIC	2.11	2.14	2.28	1.77				Ong alo . 1 49	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	2.50	2.27	2.00	2.16				Oracie : 1.46	
AICc 7.91 7.76 8.54 7.80 8.32 $\rho = 0$ AIC 10.67 10.91 11.60 8.52 BIC 10.46 9.64 10.63 8.90 CV.lse 7.64 7.56 7.75 7.05 7.34 CV.min 7.00 6.96 7.23 7.05 6.98 6.99 AIC 9.49 9.69 10.29 7.65 BIC 9.75 8.86 9.54 8.14 CV.lse 7.20 7.13 7.36 6.69 6.92 CV.min 6.61 6.57 6.86 6.67 6.59 6.59 AIC 8.92 9.11 9.68 7.18 BIC 9.29 8.44 9.08 7.77 CV.lse 30.41 30.51 30.62 28.92 30.45 CV.min 28.91 29.51 30.38 30.23 28.94 29.01 AIC 44.19 45.58 47.69 36.58 BIC 30.59 30.57 30.65 30.31 CV.lse 27.07 27.11 27.19 25.86 27.08 CV.min 25.89 26.35 27.03 27.01 25.93 25.96 AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 CV.min 24.45 24.87 25.48 25.45 24.47 25.56 CV.min 24.32 24.42 27.06 24.91 AIC 36.90 38.04 39.80 30.65 CV.racle : 6.88 R.32 $\rho = 0$ Oracle : 6.88 $\rho = 0$ Oracle : 6.88 $\rho = 0$	CV.1se	8.48	8.43	8.71	7.83	8.19				
AIC 10.67 10.91 11.60 8.52 $Oracle: 6.88$ BIC 10.46 9.64 10.63 8.90 $Oracle: 6.88$ CV.1se 7.64 7.56 7.75 7.05 7.34 $Oracle: 6.88$ CV.min 7.00 6.96 7.23 7.05 6.98 6.99 $Oracle: 6.88$ AIC 27.11 6.95 7.54 7.01 7.47 $Oracle: 6.88$ BIC 9.49 9.69 10.29 7.65 BIC 9.75 8.86 9.54 8.14 $Oracle: 6.11$ CV.1se 7.20 7.13 7.36 6.69 6.92 $Oracle: 6.11$ CV.min 6.61 6.57 6.86 6.67 6.59 6.59 $Oracle: 6.11$ AIC 8.92 9.11 9.68 7.18 $Oracle: 6.72$ 6.56 7.11 6.64 7.05 $Oracle: 5.75$ CV.1se 30.41 30.51 30.62 28.92 30.45 $Oracle: 5.75$ CV.min 28.91 29.51 30.38 30.23 28.94 29.01 $Oracle: 5.75$ AIC 28.81 29.04 32.33 29.50 29.02 $Oracle: 26.71$ BIC 30.59 30.57 30.65 30.31 $Oracle: 26.71$ CV.1se 27.07 27.11 27.19 25.86 27.08 $Oracle: 26.71$ CV.1se 27.07 27.11 27.19 25.86 27.08 $Oracle: 26.71$ CV.1se 27.07 27.11 27.19 25.86 27.08 $Oracle: 23.69$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $Oracle: 23.69$ CV.1se 25.52 25.57 25.62 24.47 25.56 $Oracle: 23.69$ AIC 24.32 24.42 27.06 24.91 24.43 $Oracle: 23.33$ AIC 24.43 $Oracle: 23.34$ AIC 36.90 38.04 39.80 30.65	CV.min	7.81	7.79	8.13	7.85	7.79	7.81		$sd(\mu)/\sigma = 1$	
BIC 10.46 9.64 10.63 8.90	AICc	7.91	7.76	8.54	7.80			8.32		
BIC 10.46 9.64 10.63 8.90 CV.1se 7.64 7.56 7.75 7.05 7.34 CV.min 7.00 6.96 7.23 7.05 6.98 6.99 AIC 7.11 6.95 7.54 7.01 7.47 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 Oracle: 6.11 EV.1se 7.20 7.13 7.36 6.69 6.92 CV.min 6.61 6.57 6.86 6.67 6.59 6.59 AIC 8.92 9.11 9.68 7.18 Oracle: 5.75 CV.1se 30.41 30.51 30.62 28.92 30.45 CV.nin 28.91 29.91 30.38 30.23 28.94 29.01 sd(μ)/σ = 0.5 AIC 28.81 29.04 32.33 29.50 29.02 ρ = 0 AIC 44.19 45.58 47.69 36.58 Oracle: 26.71 BIC 30.59 </td <td>AIC</td> <td>10.67</td> <td>10.91</td> <td>11.60</td> <td>8.52</td> <td></td> <td></td> <td></td> <td>016-00</td>	AIC	10.67	10.91	11.60	8.52				016-00	
CV.min 7.00 6.96 7.23 7.05 6.98 6.99 $sd(\mu)/\sigma = 1$ AICc 7.11 6.95 7.54 7.01 7.47 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 Oracle : 6.11 BIC 9.75 8.86 9.54 8.14 Oracle : 6.11 CV.Ise 7.20 7.13 7.36 6.69 6.92 CV.min 6.61 6.57 6.86 6.67 6.59 6.59 sd(μ)/ σ = 1 AIC 6.72 6.56 7.11 6.64 7.05 ρ = 0.9 AIC 8.92 9.11 9.68 7.18 Oracle : 5.75 CV.Ise 30.41 30.51 30.62 28.92 30.45 CV.Ise 29.09 sd(μ)/ σ = 0.5 AIC 28.81 29.04 32.33 29.50 29.02 ρ = 0 AIC 44.19 45.58 47.69 36.58 <td rowspan<="" td=""><td>BIC</td><td>10.46</td><td>9.64</td><td>10.63</td><td>8.90</td><td></td><td></td><td></td><td><i>Oracle</i> : 6.88</td></td>	<td>BIC</td> <td>10.46</td> <td>9.64</td> <td>10.63</td> <td>8.90</td> <td></td> <td></td> <td></td> <td><i>Oracle</i> : 6.88</td>	BIC	10.46	9.64	10.63	8.90				<i>Oracle</i> : 6.88
AICc 7.11 6.95 7.54 7.01 7.47 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 $\rho = 0.5$ AIC 9.75 8.86 9.54 8.14 $\rho = 0.5$ AIC 9.75 8.86 9.54 8.14 $\rho = 0.5$ AIC CV.1se 7.20 7.13 7.36 6.69 6.92 $\rho = 0.5$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.5$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.5$ AIC 28.91 29.51 30.38 30.23 28.94 29.01 $\rho = 0.5$ AIC 44.19 45.58 47.69 36.58 $\rho = 0.5$ AIC 44.19 45.58 47.69 36.58 $\rho = 0.5$ AIC 25.89 26.35 27.03 27.01 25.93 25.96 $\rho = 0.5$ AIC 25.89 26.35 27.03 27.01 25.93 25.96 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $\rho = 0.5$ AIC 24.45 24.87 25.48 25.45 24.47 25.56 $\rho = 0.5$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.5$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.5$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.5$ AIC 27.20 38.04 39.80 30.65	CV.1se	7.64	7.56	7.75	7.05	7.34				
AICc 7.11 6.95 7.54 7.01 7.47 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 $\rho = 0.5$ AIC 9.49 9.69 10.29 7.65 $\rho = 0.5$ AIC 9.75 8.86 9.54 8.14 $\rho = 0.5$ AIC 9.75 8.86 9.54 8.14 $\rho = 0.5$ AICc 6.72 6.56 7.11 6.64 7.05 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.77 $\rho = 0.9$ AIC 8.91 29.51 30.38 30.23 28.94 29.01 $\rho = 0.5$ AICc 28.81 29.04 32.33 29.50 29.02 $\rho = 0.5$ AIC 44.19 45.58 47.69 36.58 $\rho = 0.5$ AIC 44.19 45.58 47.69 36.58 BIC 30.59 30.57 30.65 30.31 $\rho = 0.5$ AICc 25.77 25.89 29.02 26.38 27.03 27.01 25.93 25.96 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $\rho = 0.5$ AICc 24.45 24.87 25.48 25.45 24.47 25.56 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65	CV.min	7.00	6.96	7.23	7.05	6.98	6.99		$sd(\mu)/\sigma = 1$	
BIC 9.75 8.86 9.54 8.14	AICc	7.11	6.95	7.54	7.01			7.47		
BIC 9.75 8.86 9.54 8.14 CV.1se 7.20 7.13 7.36 6.69 6.92 CV.min 6.61 6.57 6.86 6.67 6.59 6.59 AIC 8.92 9.11 9.68 7.18 7.05 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.18 0racle: 5.75 CV.1se 30.41 30.51 30.62 28.92 30.45 CV.min 28.91 29.51 30.38 30.23 28.94 29.01 sd(μ)/ $\sigma = 0.5$ AIC 44.19 45.58 47.69 36.58 29.02 $\rho = 0$ BIC 30.59 30.57 30.65 30.31 0racle: 26.71 CV.1se 27.07 27.11 27.19 25.86 27.08 CV.min 25.89 26.35 27.03 27.01 25.93 25.96 AIC 39.26 40.45 42.30 32.78 0racle: 23.69 CV.1se	AIC	9.49	9.69	10.29	7.65				0 1 (11	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	9.75	8.86	9.54	8.14				<i>Oracle</i> : 6.11	
AICc 6.72 6.56 7.11 6.64 7.05 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.9$ AIC 9.29 8.44 9.08 7.77 $\rho = 0.9$ AIC 28.91 30.41 30.51 30.62 28.92 30.45 $\rho = 0.9$ AIC 28.81 29.04 32.33 29.50 29.02 $\rho = 0$ AIC 44.19 45.58 47.69 36.58 BIC 30.59 30.57 30.65 30.31 $\rho = 0.5$ AICc 27.07 27.11 27.19 25.86 27.08 $\rho = 0.5$ AIC 25.77 25.89 29.02 26.38 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $\rho = 0.5$ AIC 24.32 24.45 24.87 25.56 $\rho = 0.5$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.5$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 27.20 26.98 $\rho = 0.5$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65	CV.1se	7.20	7.13	7.36	6.69	6.92				
AICc 6.72 6.56 7.11 6.64 7.05 $\rho = 0.9$ AIC 8.92 9.11 9.68 7.18 $\rho = 0.9$ AIC 9.29 8.44 9.08 7.77 $\rho = 0.9$ AIC 7.05 $\rho = 0.9$ AIC 9.29 8.44 9.08 7.77 $\rho = 0.9$ AIC 28.91 29.51 30.38 30.23 28.94 29.01 $\rho = 0.5$ AIC 28.81 29.04 32.33 29.50 29.02 $\rho = 0$ AIC 44.19 45.58 47.69 36.58 BIC 30.59 30.57 30.65 30.31 $\rho = 0.5$ AIC 27.07 27.11 27.19 25.86 27.08 $\rho = 0.5$ AIC 25.77 25.89 29.02 26.38 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $\rho = 0.5$ AIC 24.32 24.45 24.87 25.56 $\rho = 0.5$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.5$ AIC 36.90 38.04 39.80 30.65 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65	CV.min	6.61	6.57	6.86	6.67	6.59	6.59		$sd(\mu)/\sigma = 1$	
AIC 8.92 9.11 9.68 7.18 $Oracle: 5.75$ BIC 9.29 8.44 9.08 7.77 $Oracle: 5.75$								7.05		
BIC 9.29 8.44 9.08 7.77 Oracle: 5./5 CV.1se 30.41 30.51 30.62 28.92 30.45 CV.min 28.91 29.51 30.38 30.23 28.94 29.01 $sd(\mu)/\sigma = 0.5$ AICc 28.81 29.04 32.33 29.50 29.02 $\rho = 0$ AIC 44.19 45.58 47.69 36.58 00racle: 26.71 BIC 30.59 30.57 30.65 30.31 0racle: 26.71 CV.1se 27.07 27.11 27.19 25.86 27.08 CV.min 25.89 26.35 27.03 27.01 25.93 25.96 $sd(\mu)/\sigma = 0.5$ AIC 39.26 40.45 42.30 32.78 0racle: 23.69 CV.1se 25.52 25.57 25.62 24.47 25.56 CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $sd(\mu)/\sigma = 0.5$ AIC 36.90 38.04 39.80 <td>AIC</td> <td>8.92</td> <td>9.11</td> <td>9.68</td> <td>7.18</td> <td></td> <td></td> <td></td> <td>, , , , , , , , ,</td>	AIC	8.92	9.11	9.68	7.18				, , , , , , , , ,	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$									<i>Oracle</i> : 5.75	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						30.45				
AICc 28.81 29.04 32.33 29.50 29.02 $\rho = 0$ AIC 44.19 45.58 47.69 36.58 BIC 30.59 30.57 30.65 30.31 $Oracle: 26.71$ CV.1se 27.07 27.11 27.19 25.86 27.08 CV.min 25.89 26.35 27.03 27.01 25.93 25.96 AICc 25.77 25.89 29.02 26.38 25.88 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 BIC 27.17 27.16 27.20 26.98 $Oracle: 23.69$ CV.1se 25.52 25.57 25.62 24.47 25.56 CV.min 24.45 24.87 25.48 25.45 24.47 24.52 AICc 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65							29.01		$sd(\mu)/\sigma = 0.5$	
AIC 44.19 45.58 47.69 36.58 $Oracle: 26.71$ BIC 30.59 30.57 30.65 30.31 $Oracle: 26.71$ CV.1se 27.07 27.11 27.19 25.86 27.08 $Oracle: 25.89$ 26.35 27.03 27.01 25.93 25.96 $Oracle: 25.89$ AIC 25.77 25.89 29.02 26.38 25.88 $Oracle: 23.69$ BIC 27.17 27.16 27.20 26.98 $Oracle: 23.69$ CV.1se 25.52 25.57 25.62 24.47 25.56 $Oracle: 23.69$ CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $Oracle: 23.69$ AIC 36.90 38.04 39.80 30.65 $Oracle: 23.39$	AICc	28.81	29.04	32.33	29.50			29.02	. , ,	
BIC 30.59 30.57 30.65 30.31 CV.1se 27.07 27.11 27.19 25.86 27.08 CV.min 25.89 26.35 27.03 27.01 25.93 25.96 $sd(\mu)/\sigma = 0.5$ AIC 25.77 25.89 29.02 26.38 25.88 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 Oracle: 23.69 EV.1se 27.17 27.16 27.20 26.98 Oracle: 23.69 CV.1se 25.52 25.57 25.62 24.47 25.56 Sd.(μ)/ σ = 0.5 AIC 24.45 24.42 27.06 24.91 24.43 ρ = 0.9 AIC 36.90 38.04 39.80 30.65 24.47 24.43 ρ	AIC	44.19	45.58	47.69	36.58				,	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	30.59	30.57	30.65	30.31				<i>Oracle</i> : 26.71	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	27.07		27.19		27.08				
AICc 25.77 25.89 29.02 26.38 25.88 $\rho = 0.5$ AIC 39.26 40.45 42.30 32.78 Oracle : 23.69 BIC 27.17 27.16 27.20 26.98 CV.1se 25.52 25.57 25.62 24.47 25.56 CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $\sin(\mu)/\sigma = 0.5$ AICc 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65			26.35			25.93	25.96		$sd(\mu)/\sigma = 0.5$	
AIC 39.26 40.45 42.30 32.78 Oracle : 23.69 BIC 27.17 27.16 27.20 26.98 Oracle : 23.69 CV.1se 25.52 25.57 25.62 24.47 25.56 CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $sd(\mu)/\sigma = 0.5$ AIC 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65 Oracle : 22.33		25.77	25.89					25.88	· //	
BIC 27.17 27.16 27.20 26.98 Oracle: 23.69 CV.1se 25.52 25.57 25.62 24.47 25.56 $sd(\mu)/\sigma = 0.5$ CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $sd(\mu)/\sigma = 0.5$ AIC 36.90 38.04 39.80 30.65 $Oracle: 22.33$,	
CV.1se 25.52 25.57 25.62 24.47 25.56 CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $sd(\mu)/\sigma = 0.5$ AICc 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65 0racle: 22.33									<i>Oracle</i> : 23.69	
CV.min 24.45 24.87 25.48 25.45 24.47 24.52 $\sin(\mu)/\sigma = 0.5$ AICc 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65	-					25.56				
AICc 24.32 24.42 27.06 24.91 24.43 $\rho = 0.9$ AIC 36.90 38.04 39.80 30.65							24.52		$\operatorname{sd}(\mu)/\sigma = 0.5$	
AIC 36.90 38.04 39.80 30.65								24.43	· //	
$1 \operatorname{Iracle} \cdot 1/33$,	
DIC 15.00 15.07 15.05 15.TJ	BIC	25.60	25.59	25.63	25.45				<i>Oracle</i> : 22.33	

Table 29: Predictive MSE for n=1000, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	4.93	4.93	5.13	4.95	4.74			
CV.min	4.56	4.55	4.77	4.69	4.54	4.56		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.97	4.74	4.69	4.82			4.69	$\rho = 0$
AIC	5.26	5.36	5.71	4.65				Oracle: 3.92
BIC	11.76	7.65	5.74	6.80				07 acic : 3.72
CV.1se	4.43	4.41	4.59	4.50	4.26			
CV.min	4.09	4.06	4.25	4.25	4.06	4.08		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.49	4.27	4.16	4.37			4.16	$\rho = 0.5$
AIC	4.68	4.76	5.06	4.19				Oracle: 3.47
BIC	12.00	7.34	5.10	6.48				07466.3.47
CV.1se	4.17	4.16	4.31	4.30	4.00			
CV.min	3.86	3.83	3.99	4.04	3.83	3.84		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.24	4.03	3.93	4.17			3.93	$\rho = 0.9$
AIC	4.40	4.47	4.76	3.97				Oracle: 3.27
BIC	11.64	7.13	4.80	6.31				01 acte : 3.21
CV.1se	18.86	19.46	22.40	17.23	18.29			
CV.min	16.91	17.35	20.03	17.04	16.91	16.95		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	17.48	17.08	18.88	17.04			17.83	$\rho = 0$
AIC	21.90	22.52	23.77	18.38				Oracle : 14.88
BIC	24.64	24.28	24.73	22.96				Oracle : 14.00
CV.1se	17.09	17.59	20.25	15.52	16.55			
CV.min	15.17	15.53	18.18	15.31	15.17	15.21		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	15.75	15.30	16.73	15.32			16.25	$\rho = 0.5$
AIC	19.43	19.95	21.04	16.45				Oma ele . 12 17
BIC	21.85	21.67	21.93	20.83				<i>Oracle</i> : 13.17
CV.1se	16.11	16.52	19.24	14.72	15.62			
CV.min	14.32	14.64	17.15	14.48	14.33	14.35		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	14.91	14.44	15.77	14.52			15.32	$\rho = 0.9$
AIC	18.27	18.76	19.80	15.47				. 1 12 42
BIC	20.60	20.48	20.64	19.70				<i>Oracle</i> : 12.42
CV.1se	61.85	61.95	61.96	59.96	61.90			
CV.min	60.09	61.49	61.94	62.57	60.06	60.24		$sd(\mu)/\sigma = 0.5$
AICc	59.74	61.12	64.65	60.97			60.84	$\rho = 0$
AIC	89.79	93.17	96.87	76.06				0156.20
BIC	61.93	61.94	61.96	61.79				<i>Oracle</i> : 56.30
CV.1se	54.84	54.89	54.90	53.43	54.87			
CV.min	53.63	54.59	54.90	55.72	53.68	53.77		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	53.28	54.24	57.69	54.35			53.99	$\rho = 0.5$
AIC	79.60	82.49	85.78	67.95				
BIC	54.88	54.89	54.90	54.78				<i>Oracle</i> : 49.87
CV.1se	51.68	51.71	51.72	50.51	51.71			
CV.min	50.61	51.47	51.72	52.52	50.62	50.75		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	50.25	51.16	54.14	51.30			50.95	$\rho = 0.9$
AIC	74.83	77.59	80.74	63.52				
BIC	51.70	51.70	51.72	51.63				<i>Oracle</i> : 46.94
								L

Table 30: Predictive MSE for n=1000, binary design, dense covariates, and decay 200.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
AICC 12.40 11.26 10.74 11.43 10.74 $\rho = 0$ AICC 10.87 11.12 11.75 10.29 BIC 31.02 30.70 22.48 28.59 CV.lse 10.11 10.55 13.01 10.54 9.67 CV.min 8.99 9.22 10.54 9.69 8.93 9.00 $sd(\mu)/\sigma = 2$ AICC 11.39 10.18 9.56 10.45 9.59 BIC 27.48 27.38 21.35 26.13 CV.lse 9.46 9.91 12.60 10.08 9.07 CV.min 8.46 8.67 9.98 9.21 8.41 8.47 CV.lmin 8.46 8.67 9.98 9.21 8.41 8.47 AICC 10.75 9.61 9.01 9.99 9.01 $\rho = 0.9$ AIC 25.87 25.76 20.43 24.77 CV.lse 42.32 46.60 49.69 37.25 41.22 CV.lsi 36.36 40.66 48.78 36.41 36.32 36.42 AICC 38.68 36.96 40.79 36.80 37.23 $\rho = 0.8$ AIC 44.46 45.96 48.21 38.73 BIC 49.76 49.76 49.81 49.26 CV.lsi 38.81 42.45 44.07 33.54 38.03 CV.lmin 32.89 37.27 43.45 32.7 32.83 32.93 AIC 39.44 40.71 42.68 34.60 BIC 44.09 44.08 44.12 43.75 CV.lse 36.66 39.88 41.48 31.83 36.00 CV.lse 124.61 124.67 124.67 122.31 124.65 CV.lse 135.10 130.39 110.40 108.74 110.39 CV.lse 124.61 124.67 124.67 122.51 124.65 CV.lse 103.91 10.39 110.40 108.74 110.39 CV.lse 103.91 10.39 110.40 108.74 110.39 CV.lse 103.91 103.92 103.92 102.63 103.92									
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	10.01	10.28		10.65	9.96	10.02		$\operatorname{sd}(\mu)/\sigma = 2$
BIC 31.02 30.70 22.48 28.59			11.26	10.74				10.74	$\rho = 0$
Since 10.11 10.55 13.01 10.54 9.67									$Oracle \cdot 8.00$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		31.02	30.70	22.48					07466.0.77
AICC 11.39 10.18 9.56 10.45 9.29 BIC 27.48 27.38 21.35 26.13									
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					9.69	8.93	9.00		
BIC 27.48 27.38 21.35 26.13								9.56	$\rho = 0.5$
CV.1se 9.46 9.91 12.60 10.08 9.07 Sd(μ)/ σ = 2 AIC 10.75 9.61 9.01 9.99 9.99 9.01 ρ = 0.9 AIC 9.07 9.27 9.78 8.78 BIC 25.87 25.76 20.43 24.77 Oracle : 7.51		9.65	9.86	10.40	9.29				$O_{raclo} \cdot 7.07$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC			21.35					Oracle . 1.91
AICc 10.75 9.61 9.01 9.99 9.99 9.01 $\rho = 0.9$ AIC 9.07 9.27 9.78 8.78 BIC 25.87 25.76 20.43 24.77 $\rho = 0.9$ CV.1se 42.32 46.60 49.69 37.25 41.22 $\rho = 0.0$ AIC 44.46 45.96 48.21 38.73 $\rho = 0.0$ AIC 49.76 49.81 49.26 $\rho = 0.0$ AIC 35.14 33.13 36.23 33.10 33.54 38.03 $\rho = 0.0$ AIC 39.44 40.71 42.68 34.60 $\rho = 0.0$ AIC 39.44 40.71 42.68 34.60 $\rho = 0.0$ AIC 39.44 40.71 42.68 34.60 $\rho = 0.0$ AIC 30.66 39.88 41.48 31.83 36.00 $\rho = 0.0$ AIC 30.09 31.24 34.04 31.35 $\rho = 0.0$ AIC 37.06 38.26 40.14 32.51 $\rho = 0.0$ AIC 37.06 38.26 40.14 32.51 $\rho = 0.0$ AIC 121.94 127.84 127.54 124.38 124.55 $\rho = 0.9$ AIC 121.94 127.84 127.54 124.38 110.39 110.40 108.74 110.39 $\rho = 0.0$ AIC 103.81 110.39 110.40 108.74 110.39 $\rho = 0.0$ AIC 103.91 103.92 103.92 102.63 103.92 $\rho = 0.0$ AIC 190.74 157.29 162.82 129.44 $\rho = 0.0$ AIC 190.75 103.86 103.98 106.77 102.85 102.94 AIC 190.75 157.29 162.82 129.44 $\rho = 0.0$ AIC 190.75 103.86 103.98 106.77 102.85 102.94 AIC 190.75 105.01 104.97 $\rho = 0.0$ AIC 190.77 157.29 162.82 129.44	CV.1se	9.46	9.91	12.60	10.08	9.07			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	8.46	8.67	9.98	9.21	8.41	8.47		$\operatorname{sd}(\mu)/\sigma = 2$
BIC 25.87 25.76 20.43 24.77								9.01	$\rho = 0.9$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AIC	9.07	9.27	9.78	8.78				$Oraclo \cdot 7.51$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	25.87	25.76	20.43	24.77				07466.7.31
AICc 38.68 36.96 40.79 36.80 37.23 $\rho = 0$ AIC 44.46 45.96 48.21 38.73 BIC 49.76 49.76 49.81 49.26 CV.1se 38.81 42.45 44.07 33.54 38.03 CV.min 32.89 37.27 43.45 32.7 32.83 32.93 $\operatorname{sd}(\mu)/\sigma = 1$ AICc 35.14 33.13 36.23 33.10 33.62 $\rho = 0.5$ AIC 39.44 40.71 42.68 34.60 CV.1se 36.66 39.88 41.48 31.83 36.00 CV.min 31.09 34.94 40.95 30.91 31.05 31.14 $\operatorname{sd}(\mu)/\sigma = 1$ AICc 33.09 31.24 34.04 31.35 31.05 31.14 $\operatorname{sd}(\mu)/\sigma = 1$ AIC 37.06 38.26 40.14 32.51 BIC 41.50 41.50 41.53 41.22 CV.1se 124.61 124.67 124.67 122.31 124.65 CV.min 122.59 124.58 124.76 127.56 122.60 122.83 $\operatorname{AIC}(\mu)/\sigma = 0.5$ AIC 181.11 189.10 195.52 155.43 BIC 124.65 124.67 126.69 124.53 CV.1se 110.36 110.39 110.40 108.74 110.39 CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $\operatorname{sd}(\mu)/\sigma = 0.5$ AIC 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 109.04 110.39 110.40 108.74 110.39 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 AIC 102.27 106.26 106.53 104.36 102.94 AIC 102.27 106.26 106.53 104.36 104.97 $\rho = 0.9$ AIC 150.74 157.29 162.82 129.44	CV.1se	42.32	46.60	49.69					
AIC 44.46 45.96 49.76 49.81 49.26 $Oracle: 32.78$ BIC 49.76 49.76 49.81 49.26 $Oracle: 32.78$ CV.1se 38.81 42.45 44.07 33.54 38.03 $Oracle: 32.89$ 37.27 43.45 32.7 32.83 32.93 $oracle: 32.89$ 37.27 43.45 32.7 32.83 32.93 $oracle: 32.89$ $oracle: 32.89$ 37.27 43.45 32.7 32.83 32.93 $oracle: 29.05$ AIC 39.44 40.71 42.68 34.60 $oracle: 29.03$ BIC 44.09 44.08 44.12 43.75 $oracle: 29.03$ CV.1se 36.66 39.88 41.48 31.83 36.00 $oracle: 29.03$ AIC 37.06 38.26 40.14 32.51 $oracle: 29.03$ AIC 37.06 38.26 40.14 32.51 $oracle: 27.37$ BIC 41.50 41.50 41.53 41.22 $oracle: 27.37$ CV.1se 124.61 124.67 124.67 122.31 124.65 $oracle: 27.37$ CV.se 124.61 124.67 124.67 122.31 124.65 $oracle: 28.08$ AIC 181.11 189.10 195.52 155.43 $oracle: 28.08$ AIC 181.11 189.10 195.52 155.43 $oracle: 28.08$ AIC 198.53 112.85 113.18 110.60 108.74 110.39 $oracle: 28.08$ AIC 108.53 112.85 113.18 110.60 111.39 $oracle: 28.08$ AIC 108.53 112.85 113.18 110.60 111.39 $oracle: 29.05$ AIC 108.53 110.39 110.40 108.74 110.39 $oracle: 29.05$ AIC 108.53 112.85 113.18 110.60 111.39 $oracle: 29.05$ AIC 108.53 110.39 110.47 113.45 109.10 109.19 $oracle: 29.05$ AIC 108.53 110.39 110.40 108.74 110.39 $oracle: 29.05$ AIC 108.53 110.39 110.77 110.31 $oracle: 29.05$ AIC 108.57 110.38 110.39 110.77 110.31 $oracle: 29.05$ AIC 108.57 110.38 110.39 110.77 110.31 $oracle: 29.05$ AIC 108.57 103.86 103.98 106.77 102.85 102.94 $oracle: 29.05$ AIC 102.27 106.26 106.53 104.36 104.36 104.97 $oracle: 29.05$ AIC 102.27 106.26 106.53 104.36 104.36 104.97 $oracle: 29.05$ AIC 102.27 106.26 106.53 104.36 104.36 104.97 $oracle: 29.05$ AIC 102.27 106.26 106.53 104.36 104.36 104.97 $oracle: 29.05$ AIC 150.74 157.29 162.82 129.44	CV.min	36.36	40.66	48.78	36.41	36.32	36.42		$\operatorname{sd}(\mu)/\sigma = 1$
BIC 49.76 49.76 49.81 49.26 $Oracle: 32.78$ $CV.Ise$ 38.81 42.45 44.07 33.54 38.03 $CV.min$ 32.89 37.27 43.45 32.7 32.83 32.93 $cV.Min$ 39.44 40.71 42.68 34.60 $cV.Min$ 31.09 44.08 44.12 43.75 $cV.Min$ 31.09 34.94 40.95 30.91 31.05 31.14 $cV.Min$ 31.09 34.94 40.95 30.91 31.05 31.14 $cV.Min$ 31.09 34.94 34.04 31.35 31.75 $cV.Min$ 37.06 38.26 40.14 32.51 $cV.Min$ 37.06 38.26 40.14 32.51 $cV.Min$ 31.25 124.67 124.67 122.31 124.65 $cV.Min$ 122.59 124.58 124.76 127.56 122.60 122.83 $cV.Min$ 122.59 124.58 124.76 127.56 122.60 122.83 $cV.Min$ 122.59 124.58 124.76 127.56 122.60 122.83 $cV.Min$ 122.59 124.67 126.69 124.53 $cV.Min$ 109.04 110.34 110.47 113.45 109.10 109.19 $cV.Min$ 109.04 110.34 110.47 113.45 109.10 109.19 $cV.Min$ 109.04 110.34 110.47 113.45 109.10 109.19 $cV.Min$ 109.04 110.38 110.39 110.40 108.74 110.39 $cV.Min$ 109.04 110.38 110.39 110.40 108.74 110.39 $cV.Min$ 109.04 110.38 110.39 110.40 108.74 110.39 $cV.Min$ 109.04 110.38 110.39 110.77 110.31 $cV.Min$ 102.75 103.86 103.92 102.63 103.92 $cV.Min$ 102.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 102.27 106.26 106.53 104.36 104.97 $cV.Min$ 102.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 102.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.75 103.86 103.98 106.77 102.85 102.94 $cV.Min$ 104.97 $cV.Min$ 105.15 105.46 105.54 104.96 $cV.Min$ 105.15 105.46 105.54 104.96 $cV.Min$ 105.15 105.15 105.86 106.53 104.3	AICc	38.68	36.96	40.79	36.80			37.23	$\rho = 0$
BIC 49./6 49./6 49.81 49.26 CV.Ise 38.81 42.45 44.07 33.54 38.03 $sd(\mu)/\sigma = 1$ AIC 35.14 33.13 36.23 33.10 33.62 $\rho = 0.5$ AIC 39.44 40.71 42.68 34.60 Oracle : 29.03 BIC 44.09 44.08 44.12 43.75 Oracle : 29.03 CV.Ise 36.66 39.88 41.48 31.83 36.00 $sd(\mu)/\sigma = 1$ AIC 33.09 31.24 34.04 31.35 31.75 $\rho = 0.9$ AIC 37.06 38.26 40.14 32.51 Oracle : 27.37 EV.Ise 124.61 124.67 124.67 122.31 124.65 CV.min 122.59 124.58 124.76 127.56 122.60 122.83 $sd(\mu)/\sigma = 0.5$ AIC 181.11 189.10 195.52 155.43 Oracle : 118.96 CV.Ise 110.36 110.39 110.40 108.74<	AIC	44.46	45.96	48.21	38.73				Oma ala . 22 79
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	49.76	49.76	49.81	49.26				Oracie: 32.78
AICc 35.14 33.13 36.23 33.10 33.62 $\rho = 0.5$ AIC 39.44 40.71 42.68 34.60 $\rho = 0.5$ BIC 44.09 44.08 44.12 43.75 $\rho = 0.5$ CV.1se 36.66 39.88 41.48 31.83 36.00 $\rho = 0.5$ CV.min 31.09 34.94 40.95 30.91 31.05 31.14 $\rho = 0.9$ AIC 37.06 38.26 40.14 32.51 $\rho = 0.9$ AIC 41.50 41.50 41.53 41.22 $\rho = 0.9$ AIC 124.61 124.67 124.67 122.31 124.65 $\rho = 0.9$ AIC 121.94 127.84 127.54 124.38 126.15 $\rho = 0.9$ AIC 181.11 189.10 195.52 155.43 BIC 124.65 124.65 124.67 126.69 124.53 $\rho = 0.9$ AIC 180.36 110.39 110.40 108.74 110.39 $\rho = 0.5$ AICc 108.53 112.85 113.18 110.60 $\rho = 0.5$ AIC 108.53 112.85 113.18 110.60 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 $\rho = 0.5$ AIC 10.38 110.39 110.77 110.31 $\rho = 0.5$ AIC 103.91 103.92 103.92 102.63 103.92 $\rho = 0.5$ AIC 102.27 106.26 106.53 104.36 104.36 104.97 $\rho = 0.9$ AIC 150.74 157.29 162.82 129.44 $\rho = 0.5$ AIC 150.74 157.29 162.82 129.44	CV.1se	38.81	42.45	44.07	33.54	38.03			
AIC 39.44 40.71 42.68 34.60 $Oracle: 29.03$ BIC 44.09 44.08 44.12 43.75 $Oracle: 29.03$ CV.1se 36.66 39.88 41.48 31.83 36.00 $Oracle: 29.03$ AIC 33.09 31.24 34.04 31.35 31.14 $oldsymbol{align} sd(\mu)/\sigma = 1$ AIC 37.06 38.26 40.14 32.51 $oldsymbol{align} oldsymbol{align} oldsymb$	CV.min	32.89	37.27	43.45	32.7	32.83	32.93		$\operatorname{sd}(\mu)/\sigma = 1$
BIC 44.09 44.08 44.12 43.75 CV.1se 36.66 39.88 41.48 31.83 36.00 CV.min 31.09 34.94 40.95 30.91 31.05 31.14 $sd(\mu)/\sigma = 1$ AICc 33.09 31.24 34.04 31.35 31.75 $\rho = 0.9$ AIC 37.06 38.26 40.14 32.51 BIC 41.50 41.50 41.53 41.22 CV.1se 124.61 124.67 124.67 122.31 124.65 CV.min 122.59 124.58 124.76 127.56 122.60 122.83 $sd(\mu)/\sigma = 0.5$ AIC 181.11 189.10 195.52 155.43 BIC 124.65 124.67 126.69 124.53 CV.1se 110.36 110.39 110.40 108.74 110.39 CV.min 109.04 110.34 110.47 113.45 109.10 109.19 AIC 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 BIC 110.38 110.39 110.77 110.31 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 AIC 150.74 157.29 162.82 129.44 Oracle : 29.03 Oracle : 29.03 Oracle : 29.03 Oracle : 29.03 AIC 160.47 157.29 162.82 129.44 Oracle : 99.15	AICc	35.14	33.13	36.23	33.10			33.62	$\rho = 0.5$
BIC 44.09 44.08 44.12 43./5 CV.1se 36.66 39.88 41.48 31.83 36.00 CV.min 31.09 34.94 40.95 30.91 31.05 31.14 $sd(\mu)/\sigma = 1$ AIC 33.09 31.24 34.04 31.35 31.75 $\rho = 0.9$ AIC 37.06 38.26 40.14 32.51 Oracle : 27.37 BIC 41.50 41.53 41.22 Oracle : 27.37 CV.1se 124.61 124.67 124.67 122.31 124.65 $cv. min$ 122.59 124.58 124.76 127.56 122.60 122.83 $sd(\mu)/\sigma = 0.5$ AIC 181.11 189.10 195.52 155.43 $cv. min$ Dracle : 118.96 CV.1se 110.36 110.39 110.40 108.74 110.39 $cv. min$ $cv. min$ 109.04 110.34 110.47 113.45 109.10 109.19 $sd(\mu)/\sigma = 0.5$ AIC 160.43 167.29 173.04	AIC	39.44	40.71	42.68	34.60				Oma ala . 20 02
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	44.09	44.08	44.12	43.75				Oracie: 29.03
AICc 33.09 31.24 34.04 31.35 31.75 $\rho = 0.9$ AIC 37.06 38.26 40.14 32.51 BIC 41.50 41.50 41.53 41.22 CV.1se 124.61 124.67 124.67 122.31 124.65 CV.min 122.59 124.58 124.76 127.56 122.60 122.83 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 121.94 127.84 127.54 124.38 126.15 $\rho = 0$ AIC 181.11 189.10 195.52 155.43 BIC 124.65 124.67 126.69 124.53 CV.1se 110.36 110.39 110.40 108.74 110.39 CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $\operatorname{sd}(\mu)/\sigma = 0.5$ AIC 186.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 BIC 110.38 110.39 110.77 110.31 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 AICc 102.27 106.26 106.53 104.36 104.97 $\rho = 0.5$ AIC 150.74 157.29 162.82 129.44	CV.1se	36.66	39.88	41.48	31.83	36.00			
AIC 37.06 38.26 40.14 32.51 $Oracle: 27.37$	CV.min	31.09	34.94	40.95	30.91	31.05	31.14		$\operatorname{sd}(\mu)/\sigma = 1$
BIC 41.50 41.50 41.53 41.22 $CV.1se$ 124.61 124.67 124.67 122.31 124.65 $CV.min$ 122.59 124.58 124.76 127.56 122.60 122.83 $sd(\mu)/\sigma = 0.5$ AICc 121.94 127.84 127.54 124.38 126.15 $\rho = 0$ AIC 181.11 189.10 195.52 155.43 $CV.1se$ 110.36 110.39 110.40 108.74 110.39 $CV.min$ 109.04 110.34 110.47 113.45 109.10 109.19 $cV.min$ 109.04 110.34 110.47 113.45 109.10 109.19 $cV.min$ 109.05 AIC 160.43 167.29 173.04 138.30 $cV.1se$ 103.91 103.92 103.92 102.63 103.92 $cV.1se$ 103.91 103.92 103.92 102.63 103.92 $cV.1se$ 103.91 103.92 103.92 102.63 103.92 $cV.1se$ 102.75 103.86 103.98 106.77 102.85 102.94 $cV.1se$ 104.97 $cV.1se$ 105.74 157.29 162.82 129.44 $cV.1se$ 104.97 $cV.1se$ 105.41 157.29 162.82 129.44	AICc	33.09	31.24	34.04	31.35			31.75	$\rho = 0.9$
BIC 41.50 41.50 41.53 41.22 CV.1se 124.61 124.67 124.67 122.31 124.65 CV.min 122.59 124.58 124.76 127.56 122.60 122.83 $sd(\mu)/\sigma = 0.5$ AIC 121.94 127.84 127.54 124.38 126.15 $\rho = 0$ AIC 181.11 189.10 195.52 155.43 0racle: 118.96 EV.1se 110.36 110.39 110.40 108.74 110.39 109.19 $sd(\mu)/\sigma = 0.5$ CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $sd(\mu)/\sigma = 0.5$ AIC 160.43 167.29 173.04 138.30 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 0racle: 105.41 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $sd(\mu)/\sigma = 0.5$ <td>AIC</td> <td>37.06</td> <td>38.26</td> <td>40.14</td> <td>32.51</td> <td></td> <td></td> <td></td> <td>Oma ala . 27 27</td>	AIC	37.06	38.26	40.14	32.51				Oma ala . 27 27
CV.min 122.59 124.58 124.76 127.56 122.60 122.83 $sd(\mu)/\sigma = 0.5$ AIC 121.94 127.84 127.54 124.38 126.15 $\rho = 0$ AIC 181.11 189.10 195.52 155.43 0racle: 118.96 BIC 124.65 124.67 126.69 124.53 0racle: 118.96 CV.1se 110.36 110.39 110.40 108.74 110.39 109.19 $sd(\mu)/\sigma = 0.5$ AIC 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 111.39 Oracle: 105.41 CV.1se 103.91 103.92 103.92 102.63 103.92 Oracle: 105.41 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $sd(\mu)/\sigma = 0.5$ AIC 150.74 157.29 162.82 129.44 104.97 $\rho = 0.9$	BIC	41.50	41.50	41.53	41.22				Oracie : 21.31
AICc 121.94 127.84 127.54 124.38 126.15 $\rho = 0$ AIC 181.11 189.10 195.52 155.43 BIC 124.65 124.67 126.69 124.53 CV.1se 110.36 110.39 110.40 108.74 110.39 CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 BIC 110.38 110.39 110.77 110.31 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 AICc 102.27 106.26 106.53 104.36 104.97 $\rho = 0.5$ AIC 150.74 157.29 162.82 129.44	CV.1se	124.61	124.67	124.67	122.31	124.65			
AIC 181.11 189.10 195.52 155.43 $Oracle: 118.96$ BIC 124.65 124.67 126.69 124.53 $Oracle: 118.96$ CV.1se 110.36 110.39 110.40 108.74 110.39 $Oracle: 118.96$ CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $oracle: 118.96$ AIC 160.43 167.29 173.04 138.30 $oracle: 108.53$ 110.39 110.77 110.31 $Oracle: 105.41$ CV.1se 103.91 103.92 103.92 102.63 103.92 $Oracle: 105.41$ CV.1se 103.91 103.92 103.98 106.77 102.85 102.94 $oracle: 106.26$ AIC 160.27 106.26 106.53 104.36 104.97 $oracle: 109.15$ AIC 150.74 157.29 162.82 129.44	CV.min	122.59	124.58	124.76	127.56	122.60	122.83		$sd(\mu)/\sigma = 0.5$
BIC 124.65 124.67 126.69 124.53 Oracle: 118.96 CV.1se 110.36 110.39 110.40 108.74 110.39 10.39 10.40 10.74 110.39 $10.10.39$ <td>AICc</td> <td>121.94</td> <td>127.84</td> <td>127.54</td> <td>124.38</td> <td></td> <td></td> <td>126.15</td> <td>$\rho = 0$</td>	AICc	121.94	127.84	127.54	124.38			126.15	$\rho = 0$
BIC 124.65 124.67 126.69 124.53 CV.1se 110.36 110.39 110.40 108.74 110.39 CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $sd(\mu)/\sigma = 0.5$ AIC 160.43 167.29 173.04 138.30 111.39 Oracle: 105.41 BIC 110.38 110.39 110.77 110.31 Oracle: 105.41 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $sd(\mu)/\sigma = 0.5$ AIC 102.27 106.26 106.53 104.36 104.97 $\rho = 0.9$ AIC 150.74 157.29 162.82 129.44 Oracle: 99.15	AIC	181.11	189.10	195.52	155.43				Oragle : 118 06
CV.min 109.04 110.34 110.47 113.45 109.10 109.19 $sd(\mu)/\sigma = 0.5$ AIC 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 <	BIC	124.65	124.67	126.69	124.53				Oracie . 116.90
AICc 108.53 112.85 113.18 110.60 111.39 $\rho = 0.5$ AIC 160.43 167.29 173.04 138.30 $\rho = 0.5$ BIC 110.38 110.39 110.77 110.31 $\rho = 0.5$ CV.1se 103.91 103.92 103.92 102.63 103.92 $\rho = 0.5$ CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $\rho = 0.5$ AICc 102.27 106.26 106.53 104.36 104.97 $\rho = 0.5$ AIC 150.74 157.29 162.82 129.44	CV.1se	110.36	110.39	110.40	108.74	110.39			
AIC 160.43 167.29 173.04 138.30 $Oracle: 105.41$ BIC 110.38 110.39 110.77 110.31 $Oracle: 105.41$ CV.1se 103.91 103.92 103.92 102.63 103.92 $Oracle: 105.41$ CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $oracle: 106.26$ AIC 150.74 157.29 162.82 129.44 $oracle: 99.15$ $Oracle: 99.15$	CV.min	109.04	110.34		113.45	109.10	109.19		$sd(\mu)/\sigma = 0.5$
BIC 110.38 110.39 110.77 110.31 Oracle: 105.41 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $sd(\mu)/\sigma = 0.5$ AICc 102.27 106.26 106.53 104.36 104.97 $\rho = 0.9$ AIC 150.74 157.29 162.82 129.44 Oracle: 99.15	AICc	108.53	112.85	113.18	110.60			111.39	$\rho = 0.5$
BIC 110.38 110.39 110.77 110.31 CV.1se 103.91 103.92 103.92 102.63 103.92 CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $sd(\mu)/\sigma = 0.5$ AIC 102.27 106.26 106.53 104.36 104.97 $\rho = 0.9$ AIC 150.74 157.29 162.82 129.44 Oracle: 99.15	AIC	160.43	167.29	173.04	138.30				Oragle : 105 41
CV.min 102.75 103.86 103.98 106.77 102.85 102.94 $sd(\mu)/\sigma = 0.5$ AIC 150.74 157.29 162.82 129.44 $sd(\mu)/\sigma = 0.5$ $\rho = 0.9$	BIC	110.38	110.39	110.77	110.31				Oracie . 103.41
AICc 102.27 106.26 106.53 104.36 104.97 $\rho = 0.9$ AIC 150.74 157.29 162.82 129.44	CV.1se	103.91	103.92	103.92	102.63	103.92			
AIC 150.74 157.29 162.82 129.44 Oracle: 99.15	CV.min	102.75	103.86	103.98	106.77	102.85	102.94		
Uracle · yu 13	AICc	102.27	106.26	106.53	104.36			104.97	$\rho = 0.9$
BIC 103.90 103.92 104.37 103.84	AIC	150.74	157.29	162.82	129.44				Ongolo : 00 15
	BIC	103.90	103.92	104.37	103.84				Oracle : 99.13

Table 31: Predictive MSE for n=1000, continuous design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	1.38	1.35	1.31	1.32	1.28			
CV.min	1.30	1.28	1.25	1.27	1.24	1.25		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.30	1.28	1.27	1.27			1.27	$\rho = 0$
AIC	1.68	1.69	1.78	1.27				Oracle: 1.18
BIC	1.42	1.37	1.32	1.32				07 acte : 1.10
CV.1se	0.56	0.55	0.51	0.61	0.49			
CV.min	0.53	0.51	0.49	0.59	0.47	0.49		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.53	0.52	0.49	0.59			0.49	$\rho = 0.5$
AIC	0.61	0.61	0.63	0.59				Oracle: 0.45
BIC	0.64	0.60	0.54	0.61				Oracle . 0.43
CV.1se	0.16	0.15	0.14	0.17	0.14			
CV.min	0.15	0.15	0.14	0.17	0.13	0.14		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.15	0.15	0.14	0.17			0.14	$\rho = 0.9$
AIC	0.15	0.14	0.14	0.17				Oracle: 0.12
BIC	0.20	0.19	0.17	0.17				Oracie: 0.12
CV.1se	5.39	5.29	5.15	5.00	5.10			
CV.min	5.08	5.01	4.95	5.13	4.94	4.95		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.08	5.02	5.06	5.08			5.05	$\rho = 0$
AIC	7.41	7.50	8.01	5.27				0 1 470
BIC	5.41	5.32	5.32	5.09				Oracle: 4.70
CV.1se	2.19	2.12	2.01	2.08	1.94			
CV.min	2.04	1.99	1.92	2.07	1.88	1.92		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.04	1.99	1.94	2.06			1.94	$\rho = 0.5$
AIC	2.69	2.72	2.89	2.07				0 1 177
BIC	2.34	2.25	2.12	2.23				Oracle: 1.77
CV.1se	0.64	0.61	0.56	0.54	0.54			
CV.min	0.58	0.57	0.54	0.52	0.53	0.54		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58	0.57	0.55	0.52			0.57	$\rho = 0.9$
AIC	0.61	0.61	0.65	0.52				,
BIC	0.69	0.68	0.68	0.54				Oracle: 0.48
CV.1se	20.93	20.70	20.51	19.70	20.35			
CV.min	19.78	19.65	19.69	20.92	19.64	19.66		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	19.76	19.76	20.60	20.41			19.76	$\rho = 0$
AIC	31.66	32.29	34.25	24.31				
BIC	20.61	20.65	21.70	19.92				<i>Oracle</i> : 18.68
CV.1se	8.31	8.18	8.01	7.93	7.74			
CV.min	7.81	7.71	7.65	8.19	7.48	7.65		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	7.78	7.73	7.97	8.10			7.78	$\rho = 0.5$
AIC	11.66	11.85	12.62	8.89				
BIC	8.21	8.20	8.22	8.11				Oracle: 7.04
CV.1se	2.18	2.17	2.12	2.05	2.15			
CV.min	2.09	2.09	2.08	2.02	2.07	2.08		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	2.09	2.09	2.08	2.03	,		2.08	$\rho = 0.9$
AIC	2.66	2.74	3.05	2.03				,
BIC	2.10	2.09	2.08	2.07				Oracle: 1.91
	2.10	2.07	2.00	2.07				

Table 32: Predictive MSE for n=1000, continuous design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	8.89	8.75	8.73	8.62	8.46			
CV.min	8.29	8.15	8.22	8.31	8.07	8.19		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.58	8.33	8.21	8.36			8.23	$\rho = 0$
AIC	10.11	10.26	10.96	8.32				Oracle: 7.12
BIC	11.38	10.69	10.16	9.86				Oracle . 1.12
CV.1se	3.36	3.26	3.14	3.80	3.02			
CV.min	3.10	3.02	2.95	3.53	2.89	2.95		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.36	3.18	2.92	3.60			2.91	$\rho = 0.5$
AIC	3.44	3.46	3.65	3.49				Oracle: 2.44
BIC	7.68	5.31	3.78	5.59				Oracie : 2.44
CV.1se	0.63	0.61	0.58	1.17	0.56			
CV.min	0.59	0.57	0.55	1.10	0.55	0.55		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.65	0.61	0.55	1.10			0.55	$\rho = 0.9$
AIC	0.59	0.57	0.56	1.10				Oracle: 0.44
BIC	1.67	1.66	1.65	1.25				Oracie : 0.44
CV.1se	34.06	33.85	34.98	31.42	32.94			
CV.min	31.34	31.26	32.68	31.51	31.30	31.33		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	31.83	31.40	33.52	31.27			31.50	$\rho = 0$
AIC	42.77	43.75	46.49	34.15				•
BIC	42.03	40.64	48.29	35.76				Oracle: 27.62
CV.1se	13.53	12.89	13.06	12.68	11.78			
CV.min	11.81	11.55	11.96	12.24	11.26	11.61		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.25	11.78	11.53	12.34			11.74	$\rho = 0.5$
AIC	14.53	14.78	15.67	12.45				0 1 0 45
BIC	16.62	16.65	16.79	16.24				Oracle: 9.45
CV.1se	2.91	2.78	2.71	2.50	2.29			
CV.min	2.64	2.45	2.48	2.35	2.15	2.39		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.67	2.67	2.62	2.35			2.56	$\rho = 0.9$
AIC	2.29	2.32	2.52	2.34				0 1 170
BIC	2.84	2.84	2.82	2.79				Oracle: 1.72
CV.1se	122.32	122.70	123.15	116.28	122.44			
CV.min	116.26	118.42	122.17	121.45	116.33	116.64		$sd(\mu)/\sigma = 0.5$
AICc	115.83	118.96	123.27	118.51			115.82	$\rho = 0$
AIC	177.17	182.78	191.21	146.86				0 1 107.15
BIC	123.05	123.19	123.26	121.93				Oracle: 107.15
CV.1se	42.16	42.17	42.17	41.75	42.16			
CV.min	41.82	41.91	42.11	43.03	41.82	41.85		$sd(\mu)/\sigma = 0.5$
AICc	41.56	42.03	42.18	42.51			41.59	$\rho = 0.5$
AIC	60.25	61.81	64.90	50.74				0 1 26.65
BIC	42.13	42.15	42.17	42.06				Oracle: 36.65
CV.1se	7.70	7.69	7.67	7.60	7.70			
CV.min	7.50	7.49	7.47	7.50	7.46	7.47		$sd(\mu)/\sigma = 0.5$
AICc	7.49	7.51	7.49	7.52			7.48	$\rho = 0.9$
AIC	9.77	10.11	11.15	7.60				•
BIC	7.53	7.54	7.54	7.48				Oracle: 6.68

Table 33: Predictive MSE for n=1000, continuous design, dense covariates, and decay 100.

AICc 19.91 19.17 18.81 19.30 18.89	$(\mu)/\sigma = 2$ $\rho = 0$
AICc 19.91 19.17 18.81 19.30 18.89	
	$\rho = 0$
AIC 21.09 21.49 22.88 18.63	cle: 15.73
BIC 46.55 33.24 24.57 27.18	ие. 13.73
CV.1se 7.50 7.32 7.19 9.12 7.09	
CV.min 6.74 6.63 6.69 8.03 6.70 6.65 sd	$(\mu)/\sigma = 2$
AICc 8.11 7.40 6.65 8.66 6.65	$\rho = 0.5$
AIC 7.16 7.24 7.62 7.58	acle: 5.31
BIC 20./8 20.81 1/.61 20.27	acie . 5.51
CV.1se 1.32 1.28 1.23 2.70 1.26	
	$(\mu)/\sigma = 2$
AICc 1.51 1.32 1.16 2.40 1.16	$\rho = 0.9$
AIC 1.18 1.14 1.15 2.36	acle: 0.90
BIC 3.33 3.33 3.31 3.28	acie . 0.90
CV.1se 75.68 78.22 89.56 69.05 73.29	
	$(\mu)/\sigma = 1$
AICc 70.19 69.24 77.65 68.32 69.41	$\rho = 0$
AIC 87.75 90.22 95.25 73.65	cle: 59.71
BIC 98.91 98.92 99.42 91.76	
CV.1se 32.61 32.35 33.50 27.99 31.66	
	$(\mu)/\sigma = 1$
AICc 28.71 27.60 27.00 27.01 27.97	$\rho = 0.5$
AIC 29.61 30.23 31.88 26.46	cle: 20.16
BIC 33.51 33.54 33.58 33.30	
CV.1se 5.69 5.68 5.64 5.37 5.66	
	$(\mu)/\sigma = 1$
AICc 5.41 5.49 5.47 4.92 5.42	$\rho = 0.9$
AIC 4.51 4.59 5.00 4.75	acle: 3.43
BIC 5.51 5.48 5.47	acic . 5.45
CV.1se 248.48 248.75 248.83 240.83 248.64	
	$a)/\sigma = 0.5$
AICc 239.87 247.57 248.98 244.78 239.94	$\rho = 0$
AIC 359.81 373.33 388.16 305.32	le: 225.74
BIC 248.75 248.83 260.38 248.16	
CV.1se 84.04 84.04 84.04 83.70 84.04	
	$a)/\sigma = 0.5$
AICc 83.45 84.01 84.08 85.29 83.43	$\rho = 0.5$
AIC 120.66 124.51 130.20 103.48	cle: 76.23
BIC 84.03 84.04 84.04 83.99	
CV.1se 14.33 14.33 14.29 14.34	
	$a)/\sigma = 0.5$
AICc 14.13 14.20 14.25 14.25 14.14	$\rho = 0.9$
AIC 18.82 19.62 21.33 14.53	cle: 12.97
BIC 14.23 14.25 14.31 14.17	

Table 34: Predictive MSE for n=1000, continuous design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	44.42	46.71	56.79	46.06	42.76			
CV.min	40.06	41.17	46.59	42.63	39.87	40.10		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	49.74	45.58	43.24	45.76			44.27	$\rho = 0$
AIC	43.49	44.52	47.03	41.20				<i>Oracle</i> : 36.05
BIC	124.28	124.46	72.81	114.38				07ace . 30.03
CV.1se	20.11	21.43	39.27	23.34	19.23			
CV.min	15.20	15.65	34.29	19.50	15.17	15.14		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	26.86	19.33	15.30	22.13			15.30	$\rho = 0.5$
AIC	14.76	14.97	15.68	16.30				<i>Oracle</i> : 12.09
BIC	41.76	41.80	41.06	41.46				Oracie: 12.09
CV.1se	5.61	5.64	6.78	6.32	6.14			
CV.min	4.01	4.16	6.49	5.32	4.91	3.73		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.40	6.11	2.57	5.28			2.57	$\rho = 0.9$
AIC	2.40	2.37	2.43	4.53				Oracle: 1.98
BIC	6.66	6.66	6.64	6.60				Oracie: 1.98
CV.1se	169.30	187.88	199.29	149.02	165.35			
CV.min	145.46	163.65	195.22	145.76	145.47	145.65		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	155.35	149.68	176.34	147.26			151.51	$\rho = 0$
AIC	178.00	184.00	193.01	154.99				
BIC	199.52	199.72	199.19	197.28				<i>Oracle</i> : 131.43
CV.1se	66.93	67.00	67.02	59.80	66.97			
CV.min	64.04	65.70	66.87	55.90	63.97	64.09		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	63.18	65.26	63.30	57.33			63.14	$\rho = 0.5$
AIC	59.68	61.25	64.28	54.73				0 1 44 00
BIC	66.99	67.02	67.02	66.86				Oracle: 44.09
CV.1se	11.00	11.00	10.99	10.89	11.01			
CV.min	10.74	10.74	10.76	10.35	10.73	10.72		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.65	10.82	10.84	10.27			10.65	$\rho = 0.9$
AIC	9.05	9.31	10.04	9.44				0 1 7.22
BIC	10.86	10.87	10.92	10.78				Oracle: 7.22
CV.1se	499.75	499.92	499.94	490.79	499.87			
CV.min	491.34	499.45	500.31	511.49	491.87	492.40		$sd(\mu)/\sigma = 0.5$
AICc	488.97	501.61	499.93	498.68			488.93	$\rho = 0$
AIC	725.13	757.08	782.66	623.41				01 476.92
BIC	499.85	499.93	702.82	499.40				<i>Oracle</i> : 476.83
CV.1se	167.73	167.73	167.73	167.37	167.73			
CV.min	167.35	167.70	167.82	172.56	167.40	167.48		$sd(\mu)/\sigma = 0.5$
AICc	166.89	167.74	167.73	170.57			166.89	$\rho = 0.5$
AIC	241.13	250.55	260.98	208.44				01150.04
BIC	167.72	167.73	169.58	167.68				<i>Oracle</i> : 159.94
CV.1se	27.55	27.55	27.55	27.53	27.55			
CV.min	27.44	27.45	27.50	27.54	27.44	27.44		$sd(\mu)/\sigma = 0.5$
AICc	27.39	27.50	27.54	27.60			27.39	$\rho = 0.9$
AIC	36.95	38.80	41.67	28.31				,
BIC	27.52	27.53	27.55	27.47				Oracle: 26.20

Table 35: Predictive MSE for n=1000, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	0.34	0.34	0.33	0.33	0.32			
CV.min	0.32	0.32	0.31	0.32	0.31	0.31		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.32	0.32	0.31	0.32			0.31	$\rho = 0$
AIC	0.42	0.42	0.45	0.32				Oracle : 0.31
BIC	0.35	0.34	0.32	0.33				074666.0.31
CV.1se	0.31	0.30	0.29	0.30	0.29			
CV.min	0.29	0.29	0.28	0.29	0.28	0.28		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.29	0.29	0.28	0.29			0.28	$\rho = 0.5$
AIC	0.37	0.38	0.40	0.29				Oracle: 0.28
BIC	0.32	0.31	0.29	0.30				07 acte : 0.26
CV.1se	0.29	0.29	0.28	0.28	0.27			
CV.min	0.28	0.27	0.26	0.27	0.26	0.26		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.28	0.27	0.26	0.27			0.26	$\rho = 0.9$
AIC	0.35	0.35	0.37	0.27				Oracle: 0.26
BIC	0.30	0.29	0.27	0.28				07acte . 0.20
CV.1se	1.34	1.32	1.29	1.25	1.27			
CV.min	1.26	1.25	1.23	1.28	1.23	1.23		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.26	1.25	1.27	1.27			1.27	$\rho = 0$
AIC	1.85	1.87	2.00	1.31				Oracle : 1.24
BIC	1.35	1.31	1.29	1.27				07466 . 1.24
CV.1se	1.21	1.18	1.15	1.12	1.13			
CV.min	1.14	1.12	1.1	1.15	1.1	1.10		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.14	1.12	1.13	1.14			1.13	$\rho = 0.5$
AIC	1.65	1.67	1.78	1.18				Oracle: 1.11
BIC	1.22	1.18	1.15	1.14				07466.1.11
CV.1se	1.14	1.12	1.09	1.06	1.07			
CV.min	1.08	1.06	1.04	1.08	1.04	1.05		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.08	1.06	1.07	1.08			1.07	$\rho = 0.9$
AIC	1.55	1.57	1.68	1.11				Oracle : 1.05
BIC	1.16	1.12	1.09	1.09				Oracle : 1.03
CV.1se	5.21	5.16	5.11	4.90	5.07			
CV.min	4.93	4.89	4.90	5.20	4.89	4.90		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.92	4.89	5.17	5.08			4.97	$\rho = 0$
AIC	7.90	8.06	8.55	6.07				Oracle : 4.98
BIC	5.14	5.09	5.21	4.96				Oracle : 4.98
CV.1se	4.68	4.62	4.56	4.39	4.53			
CV.min	4.42	4.38	4.38	4.67	4.37	4.37		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.41	4.38	4.62	4.55			4.46	$\rho = 0.5$
AIC	7.06	7.19	7.62	5.44				Oma ala . 4.44
BIC	4.62	4.57	4.64	4.46				Oracle : 4.44
CV.1se	4.43	4.38	4.33	4.17	4.28			
CV.min	4.18	4.15	4.16	4.40	4.13	4.15		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.18	4.15	4.38	4.31			4.23	$\rho = 0.9$
AIC	6.65	6.78	7.20	5.08				Oracle : 4.20
BIC	4.39	4.34	4.40	4.23				07 ucie : 4.20

Table 36: Predictive MSE for n=1000, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	2.11	2.06	2.02	2.04	1.97			
CV.min	1.98	1.93	1.91	1.97	1.89	1.91		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	2.03	1.95	1.93	1.98			1.93	$\rho = 0$
AIC	2.47	2.50	2.68	1.98				Oracle: 1.66
BIC	2.59	2.38	2.18	2.29				07 acic . 1.00
CV.1se	1.90	1.85	1.81	1.85	1.76			
CV.min	1.78	1.73	1.71	1.78	1.69	1.71		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.83	1.76	1.71	1.79			1.72	$\rho = 0.5$
AIC	2.20	2.23	2.38	1.79				Oracle: 1.47
BIC	2.40	2.19	1.95	2.12				Oracie: 1.47
CV.1se	1.79	1.74	1.70	1.76	1.65			
CV.min	1.68	1.64	1.61	1.69	1.59	1.62		$sd(\mu)/\sigma = 2$
AICc	1.73	1.66	1.62	1.70			1.62	$\rho = 0.9$
AIC	2.07	2.09	2.23	1.69				Oracle: 1.38
BIC	2.28	2.08	1.84	2.02				Oracie: 1.38
CV.1se	8.24	8.17	8.39	7.62	7.95			
CV.min	7.60	7.57	7.86	7.64	7.58	7.60		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.69	7.54	8.30	7.58			8.08	$\rho = 0$
AIC	10.46	10.70	11.38	8.30				-
BIC	10.06	9.29	10.18	8.59				Oracle: 6.62
CV.1se	7.42	7.33	7.47	6.86	7.11			
CV.min	6.82	6.77	6.99	6.87	6.78	6.79		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.92	6.76	7.35	6.82			7.26	$\rho = 0.5$
AIC	9.31	9.51	10.10	7.46				0 1 7 00
BIC	9.38	8.53	9.14	7.86				Oracle: 5.88
CV.1se	6.99	6.92	7.11	6.51	6.71			
CV.min	6.44	6.39	6.65	6.49	6.40	6.41		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.54	6.38	6.88	6.46			6.83	$\rho = 0.9$
AIC	8.75	8.94	9.50	7.00				•
BIC	8.98	8.13	8.69	7.50				Oracle: 5.54
CV.1se	29.81	29.91	30.03	28.31	29.84			
CV.min	28.31	28.88	29.78	29.60	28.34	28.39		$sd(\mu)/\sigma = 0.5$
AICc	28.2	28.41	31.56	28.90			28.40	$\rho = 0$
AIC	43.35	44.71	46.79	35.84				•
BIC	30.01	29.97	30.07	29.69				<i>Oracle</i> : 26.48
CV.1se	26.57	26.62	26.70	25.36	26.60			
CV.min	25.38	25.82	26.53	26.50	25.42	25.44		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	25.25	25.38	28.50	25.87			25.38	$\rho = 0.5$
AIC	38.55	39.72	41.54	32.20				,
BIC	26.68	26.67	26.72	26.49				Oracle: 23.53
CV.1se	25.05	25.11	25.16	23.99	25.10			
CV.min	23.95	24.36	25.01	24.95	23.99	24.03		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	23.85	23.94	26.63	24.43	20.77	25	23.94	$\rho = 0.9$
AIC	36.24	37.35	39.09	30.06				•
BIC	25.15	25.13	25.18	24.98				Oracle: 22.16
	25.15	20.10	23.10	21.70				

Table 37: Predictive MSE for n=1000, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	3.76	3.61	3.36	3.65	3.30			
CV.min	3.56	3.43	3.26	3.53	3.26	3.28		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.67	3.47	3.35	3.55			3.36	$\rho = 0$
AIC	4.47	4.55	4.87	3.57				Oracle: 2.94
BIC	4.59	4.06	3.62	4.07				07 acie . 2.94
CV.1se	3.38	3.23	2.98	3.31	2.91			
CV.min	3.20	3.08	2.90	3.20	2.88	2.90		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.30	3.11	2.98	3.23			2.98	$\rho = 0.5$
AIC	3.98	4.05	4.32	3.23				Oracle: 2.61
BIC	4.23	3.69	3.20	3.78				Oracle: 2.01
CV.1se	3.18	3.04	2.83	3.16	2.76			
CV.min	3.02	2.91	2.75	3.04	2.72	2.76		$sd(\mu)/\sigma = 2$
AICc	3.12	2.94	2.81	3.07			2.81	$\rho = 0.9$
AIC	3.74	3.81	4.07	3.06				Oracle: 2.46
BIC	4.04	3.51	3.04	3.63				Oracle : 2.40
CV.1se	15.29	15.35	16.83	14.13	14.78			
CV.min	13.96	14.04	15.26	14.06	13.95	13.98		$sd(\mu)/\sigma = 1$
AICc	14.24	13.96	15.45	14.00			14.51	$\rho = 0$
AIC	18.83	19.34	20.48	15.33				0 1 11 70
BIC	21.17	19.98	21.18	17.90				<i>Oracle</i> : 11.78
CV.1se	13.82	13.84	15.21	12.77	13.33			
CV.min	12.54	12.58	13.66	12.68	12.53	12.54		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.85	12.52	13.71	12.65			13.25	$\rho = 0.5$
AIC	16.74	17.18	18.16	13.77				•
BIC	18.86	18.33	18.89	16.72				Oracle: 10.46
CV.1se	13.02	13.04	14.46	12.13	12.59			
CV.min	11.84	11.86	13.02	12.00	11.83	11.83		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.15	11.82	12.94	11.98			12.53	$\rho = 0.9$
AIC	15.75	16.16	17.10	12.95				·
BIC	17.80	17.37	17.79	16.04				Oracle: 9.86
CV.1se	53.36	53.48	53.51	51.35	53.41			
CV.min	51.39	52.79	53.45	53.56	51.43	51.55		$sd(\mu)/\sigma = 0.5$
AICc	51.14	52.09	55.86	52.29			51.95	$\rho = 0$
AIC	77.50	80.32	83.64	65.12				·
BIC	53.49	53.50	53.52	53.31				<i>Oracle</i> : 47.14
CV.1se	47.42	47.49	47.51	45.88	47.46			
CV.min	46.02	46.99	47.48	47.86	46.06	46.14		$sd(\mu)/\sigma = 0.5$
AICc	45.75	46.41	50.02	46.73			46.29	$\rho = 0.5$
AIC	68.81	71.22	74.17	58.32				,
BIC	47.49	47.49	47.51	47.37				<i>Oracle</i> : 41.82
CV.1se	44.74	44.79	44.80	43.44	44.78			
CV.min	43.47	44.38	44.80	45.16	43.50	43.59		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	43.18	43.79	46.92	44.14			43.66	$\rho = 0.9$
AIC	64.73	67.04	69.87	54.55				·
BIC	44.79	44.79	44.81	44.69				<i>Oracle</i> : 39.43
	/	1 1117	11.01	1 1.07				

Table 38: Predictive MSE for n=1000, binary design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	5.50	5.19	4.63	5.29	4.56			
CV.min	5.24	4.99	4.60	5.13	4.55	4.60		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.39	5.03	4.76	5.16			4.75	$\rho = 0$
AIC	6.62	6.76	7.25	5.24				Oracle : 4.33
BIC	6.47	5.65	4.98	5.74				074666.4.55
CV.1se	4.93	4.64	4.09	4.81	4.01			
CV.min	4.70	4.46	4.08	4.66	4	4.08		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.85	4.51	4.20	4.69			4.20	$\rho = 0.5$
AIC	5.89	6.00	6.43	4.73				<i>Oracle</i> : 3.84
BIC	5.94	5.10	4.38	5.31				074666.5.04
CV.1se	4.65	4.38	3.88	4.59	3.81			
CV.min	4.44	4.22	3.88	4.43	3.78	3.88		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.59	4.26	3.97	4.46			3.98	$\rho = 0.9$
AIC	5.54	5.65	6.05	4.49				<i>Oracle</i> : 3.62
BIC	5.65	4.82	4.15	5.08				07466 . 3.02
CV.1se	22.82	23.17	26.71	21.08	22.03			
CV.min	20.74	21.00	23.69	20.92	20.74	20.79		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	21.25	20.81	23.26	20.86			21.08	$\rho = 0$
AIC	27.81	28.66	30.26	22.86				Oracle: 17.32
BIC	31.33	30.68	31.31	28.86				07466 . 17.32
CV.1se	20.66	20.93	24.44	19.07	19.93			
CV.min	18.64	18.82	21.57	18.87	18.64	18.66		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	19.17	18.65	20.58	18.86			19.17	$\rho = 0.5$
AIC	24.70	25.42	26.82	20.50				Oracle: 15.36
BIC	27.83	27.60	27.86	26.46				07 acic . 13.30
CV.1se	19.48	19.76	23.30	18.14	18.83			
CV.min	17.62	17.78	20.53	17.88	17.61	17.62		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	18.13	17.63	19.45	17.89			18.14	$\rho = 0.9$
AIC	23.26	23.95	25.28	19.30				Oracle : 14.49
BIC	26.26	26.12	26.29	25.22				014016.14.49
CV.1se	78.47	78.59	78.62	75.90	78.53			
CV.min	76.00	78.08	78.62	79.15	76.01	76.19		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	75.6	77.89	81.00	77.21			77.52	$\rho = 0$
AIC	114.01	118.59	123.13	96.44				Oracle : 69.25
BIC	78.59	78.61	78.62	78.42				074666 . 07.23
CV.1se	69.71	69.78	69.79	67.79	69.75			
CV.min	68.02	69.44	69.81	70.68	68.07	68.17		$sd(\mu)/\sigma = 0.5$
AICc	67.61	69.22	72.36	68.97			68.86	$\rho = 0.5$
AIC	101.21	105.15	109.20	86.21				Oracle : 61.43
BIC	69.77	69.78	69.79	69.65				07466.01.43
CV.1se	65.81	65.86	65.86	64.21	65.85	<u> </u>		
CV.min	64.32	65.58	65.89	66.75	64.36	64.49		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	63.9	65.37	68.08	65.23			65.06	$\rho = 0.9$
AIC	95.28	99.04	102.94	80.65				Oracle : 57.96
BIC	65.85	65.85	65.86	65.75				- Cracic . 31.70

Table 39: Predictive MSE for n=1000, continuous design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	AL	MCP	CVbest	ICbest	
CV.1se	1.38	1.35	1.31	1.32	1.28			
CV.min	1.30	1.28	1.25	1.27	1.24	1.25		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.30	1.28	1.27	1.27			1.27	$\rho = 0$
AIC	1.68	1.69	1.79	1.27				Oracle: 1.25
BIC	1.42	1.37	1.32	1.32				07 acte : 1.25
CV.1se	0.56	0.55	0.51	0.61	0.49			
CV.min	0.53	0.51	0.49	0.59	0.47	0.49		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.53	0.52	0.49	0.59			0.49	$\rho = 0.5$
AIC	0.61	0.61	0.63	0.59				Oracle: 0.47
BIC	0.64	0.60	0.54	0.61				07 acte . 0.47
CV.1se	0.16	0.15	0.14	0.17	0.14			
CV.min	0.15	0.15	0.14	0.17	0.13	0.14		$sd(\mu)/\sigma = 2$
AICc	0.15	0.15	0.14	0.17			0.14	$\rho = 0.9$
AIC	0.15	0.14	0.14	0.17				0
BIC	0.20	0.19	0.17	0.17				Oracle: 0.13
CV.1se	5.39	5.29	5.15	5.00	5.10			
CV.min	5.08	5.01	4.95	5.13	4.94	4.95		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.08	5.02	5.06	5.08			5.05	$\rho = 0$
AIC	7.41	7.50	8.01	5.27				-
BIC	5.42	5.32	5.32	5.09				Oracle: 4.99
CV.1se	2.19	2.12	2.01	2.08	1.94			
CV.min	2.04	1.99	1.92	2.07	1.88	1.92		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.04	1.99	1.94	2.06			1.94	$\rho = 0.5$
AIC	2.69	2.72	2.89	2.07				•
BIC	2.34	2.25	2.12	2.23				Oracle: 1.88
CV.1se	0.64	0.61	0.56	0.54	0.54			
CV.min	0.58	0.57	0.54	0.52	0.53	0.54		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58	0.57	0.55	0.52	0.00	0.0 .	0.57	$\rho = 0.9$
AIC	0.61	0.61	0.65	0.52			0.07	•
BIC	0.69	0.68	0.68	0.54				Oracle: 0.51
CV.1se	20.93	20.70	20.50	19.70	20.35			
CV.rise CV.min	19.78	19.65	19.69	20.92	19.64	19.66		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	19.76	19.76	20.60	20.41	17.01	17.00	19.76	$\rho = 0$
AIC	31.66	32.29	34.25	24.31			17.70	·
BIC	20.61	20.65	21.70	19.91				Oracle: 19.97
CV.1se	8.31	8.18	8.01	7.93	7.74			
CV.13c	7.82	7.71	7.66	8.19	7.48	7.65		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	7.78	7.74	7.98	8.10	7.40	7.03	7.78	$\rho = 0.5$
AIC	11.66	11.85	12.62	8.89			7.76	•
BIC	8.22	8.21	8.22	8.12				Oracle: 7.53
CV.1se	2.18	2.17	2.12	2.05	2.15			
CV.1se CV.min	2.16	2.17	2.12	2.03 2.02	2.13	2.08		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	2.09	2.09	2.08	2.02	2.07	2.00	2.08	$\beta \operatorname{sd}(\mu)/\delta = 0.3$ $\rho = 0.9$
AICC	2.66	2.09	3.05	2.03			2.00	$\rho = 0.9$
			2.08					Oracle: 2.04
BIC	2.10	2.09	2.08	2.07				

Table 40: Predictive MSE for n=1000, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$,	AL	MCP	CVbest	ICbest	
CV.1se	8.47	8.27	8.11	8.19	7.90			
CV.min	7.94	7.76	7.67	7.92	7.61	7.69		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.15	7.88	7.74	7.95			7.76	$\rho = 0$
AIC	9.89	10.03	10.73	7.94				Oracle: 6.65
BIC	10.42	9.81	9.31	9.16				Oracie . 0.03
CV.1se	3.20	3.09	2.93	3.63	2.81			
CV.min	2.98	2.89	2.78	3.38	2.71	2.78		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.18	3.01	2.76	3.44			2.76	$\rho = 0.5$
AIC	3.35	3.38	3.57	3.36				Oracle: 2.28
BIC	6.83	4.77	3.50	5.19				Oracie : 2.28
CV.1se	0.61	0.59	0.55	1.14	0.53			
CV.min	0.57	0.55	0.53	1.08	0.52	0.53		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.62	0.58	0.53	1.08			0.53	$\rho = 0.9$
AIC	0.57	0.55	0.54	1.08				0 1 0 10
BIC	1.64	1.64	1.59	1.21				Oracle: 0.42
CV.1se	33.07	32.79	33.77	30.55	31.94			
CV.min	30.50	30.37	31.59	30.66	30.41	30.47		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	30.93	30.49	32.44	30.41			30.59	$\rho = 0$
AIC	41.93	42.89	45.60	33.25				,
BIC	40.50	39.02	47.09	34.53				Oracle: 26.59
CV.1se	13.10	12.48	12.58	12.37	11.41			
CV.min	11.51	11.24	11.59	11.95	10.93	11.30		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.92	11.46	11.22	12.03	2000	11.00	11.40	$\rho = 0.5$
AIC	14.26	14.50	15.38	12.16			11.10	,
BIC	16.31	16.34	16.49	15.92				Oracle: 9.11
CV.1se	2.86	2.70	2.63	2.46	2.21			
CV.rise CV.min	2.56	2.37	2.38	2.31	2.09	2.31		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.60	2.59	2.53	2.31	2.07	2.31	2.48	$\rho = 0.9$
AIC	2.26	2.28	2.48	2.30			2.40	•
BIC	2.80	2.80	2.78	2.75				Oracle: 1.68
CV.1se	119.93	120.31	120.82	113.86	120.03			
CV.1se CV.min	113.81	115.93	119.70	118.93	113.89	114.14		$sd(\mu)/\sigma = 0.5$
AICc	113.42	116.46	120.93	116.93	113.09	114,14	113.39	$sa(\mu)/\sigma = 0.3$ $\rho = 0$
AICC	173.78	179.27	187.58	144.00			113.39	$\rho = 0$
BIC			120.92	119.52				Oracle: 106.35
CV.1se	120.69	120.84			41.40			
	41.42	41.42	41.42	40.99	41.42	41.00		1/)/ 0.5
CV.min	41.07	41.14	41.36	42.25	41.06	41.08	40.00	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	40.82	41.28	41.44	41.71			40.82	$\rho = 0.5$
AIC	59.16	60.69	63.73	49.77				Oracle: 36.43
BIC	41.38	41.40	41.42	41.31	7.60			
CV.1se	7.60	7.59	7.57	7.50	7.60	7.05		1/)/ ^ ~ ~
CV.min	7.40	7.39	7.37	7.40	7.36	7.37	-	$sd(\mu)/\sigma = 0.5$
AICc	7.39	7.41	7.39	7.42			7.38	$\rho = 0.9$
AIC	9.64	9.97	11.00	7.50				Oracle: 6.70
BIC	7.43	7.44	7.43	7.38				

Table 41: Predictive MSE for n=1000, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$,	AL	MCP	CVbest	ICbest	
CV.1se	15.10	14.47	13.52	14.64	13.24			
CV.min	14.30	13.80	13.11	14.18	13.12	13.17		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	14.72	14.01	13.45	14.25			13.53	$\rho = 0$
AIC	17.93	18.24	19.55	14.33				Oracle: 11.82
BIC	18.30	16.69	14.97	16.28				07466.11.02
CV.1se	5.57	5.26	4.71	6.67	4.41			
CV.min	5.32	5.06	4.65	6.10	4.39	4.65		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.67	5.23	4.64	6.35			4.64	$\rho = 0.5$
AIC	6.07	6.12	6.49	5.98				Oracle: 4.01
BIC	17.96	17.51	5.13	16.69				07466.4.01
CV.1se	1.01	0.96	0.86	2.24	0.82			
CV.min	0.97	0.92	0.85	2.01	0.81	0.85		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.06	0.97	0.85	2.02			0.85	$\rho = 0.9$
AIC	0.96	0.93	0.94	2.01				Oracle: 0.70
BIC	2.91	2.92	2.88	2.82				014616.0.70
CV.1se	61.30	61.63	67.80	56.69	59.40			
CV.min	56.03	56.36	61.20	56.45	56.05	56.08		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	57.25	56.51	61.22	56.21			56.57	$\rho = 0$
AIC	75.47	77.53	82.05	61.51				Oracle: 47.30
BIC	85.09	84.04	85.85	71.78				Oracle: 47.30
CV.1se	26.22	25.20	28.27	23.25	23.48			
CV.min	21.83	21.47	26.06	22.17	21.11	21.36		$sd(\mu)/\sigma = 1$
AICc	22.98	21.55	21.26	22.50			21.78	$\rho = 0.5$
AIC	25.54	26.06	27.54	22.37				0116.04
BIC	29.05	29.08	29.14	28.80				Oracle: 16.04
CV.1se	5.02	4.99	4.96	4.61	4.79			
CV.min	4.76	4.68	4.79	4.25	4.36	4.69		$sd(\mu)/\sigma = 1$
AICc	4.74	4.81	4.76	4.23			4.70	$\rho = 0.9$
AIC	3.92	3.98	4.36	4.11				0 1 200
BIC	4.86	4.86	4.83	4.81				Oracle: 2.80
CV.1se	214.42	214.86	215.02	206.23	214.59			
CV.min	206.43	212.06	214.78	214.96	206.33	207.05		$sd(\mu)/\sigma = 0.5$
AICc	205.31	212.39	215.21	209.69			205.37	$\rho = 0$
AIC	310.41	321.76	335.07	261.14				•
BIC	214.89	215.00	217.26	214.16				<i>Oracle</i> : 189.14
CV.1se	72.92	72.92	72.92	72.56	72.92			
CV.min	72.61	72.80	72.95	74.88	72.64	72.66		$sd(\mu)/\sigma = 0.5$
AICc	72.32	72.89	72.96	73.92			72.31	$\rho = 0.5$
AIC	104.61	107.80	112.84	89.35				•
BIC	72.91	72.92	72.92	72.88				<i>Oracle</i> : 64.15
CV.1se	12.72	12.72	12.71	12.66	12.72			
CV.min	12.53	12.53	12.53	12.57	12.51	12.51		$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	12.5	12.58	12.60	12.60			12.50	$\rho = 0.9$
AIC	16.60	17.27	18.84	12.81				•
BIC	12.61	12.62	12.69	12.54				Oracle: 11.20
סוכ	12.01	12.02	12.03	14.54				

Table 42: Predictive MSE for n=1000, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$		AL	MCP	CVbest	ICbest	
CV.1se	22.06	20.83	18.60	21.21	18.31			
CV.min	21.02	20.04	18.49	20.59	18.26	18.51		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	21.63	20.28	19.18	20.69			19.29	$\rho = 0$
AIC	26.52	27.07	29.04	21.02				Oracle: 17.37
BIC	26.07	23.17	20.23	23.08				01acic . 11.31
CV.1se	8.07	7.45	6.44	9.77	6.03			
CV.min	7.79	7.30	6.54	8.91	6.04	6.54		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.27	7.47	6.47	9.35			6.48	$\rho = 0.5$
AIC	8.98	9.08	9.65	8.69				Oracle: 5.87
BIC	26.50	25.09	6.71	25.92				Oracie . 5.67
CV.1se	1.44	1.33	1.17	3.34	1.09			
CV.min	1.39	1.31	1.18	2.88	1.10	1.19		$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.51	1.35	1.16	2.90			1.16	$\rho = 0.9$
AIC	1.39	1.34	1.41	2.84				Oracle: 1.01
BIC	4.27	4.28	3.44	4.21				Oracie : 1.01
CV.1se	91.40	92.90	107.18	84.53	88.38			
CV.min	83.20	84.26	95.00	83.92	83.19	83.31		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	85.14	84.21	93.73	83.70			84.23	$\rho = 0$
AIC	111.39	114.82	121.21	91.72				•
BIC	125.83	125.78	126.15	116.17				Oracle: 69.47
CV.1se	40.67	40.08	42.55	34.99	39.34			
CV.min	34.02	34.26	41.87	33.17	33.76	33.38		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	35.81	32.73	32.27	33.80			33.55	$\rho = 0.5$
AIC	37.63	38.50	40.63	33.23				
BIC	42.62	42.64	42.67	42.42				Oracle: 23.49
CV.1se	7.28	7.27	7.23	6.96	7.25			
CV.min	6.96	6.94	6.98	6.41	6.89	6.93		$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.90	7.03	7.00	6.35			6.89	$\rho = 0.9$
AIC	5.77	5.89	6.45	5.97				•
BIC	7.09	7.11	7.11	7.01				Oracle: 4.03
CV.1se	315.28	315.72	315.85	304.89	315.47			
CV.min	305.33	313.63	315.86	317.57	305.18	306.22		$sd(\mu)/\sigma = 0.5$
AICc	303.58	314.44	315.81	309.81			303.59	$\rho = 0$
AIC	456.70	475.12	493.35	386.66				•
BIC	315.72	315.81	351.65	314.97				Oracle: 277.88
CV.1se	106.78	106.79	106.78	106.40	106.79			
CV.min	106.43	106.70	106.84	109.83	106.46	106.57		$sd(\mu)/\sigma = 0.5$
AICc	106.08	106.77	106.79	108.39	100.10	100.57	106.12	$\rho = 0.5$
AIC	153.36	158.62	165.71	131.58			100.12	•
BIC	106.77	106.78	106.79	106.75				Oracle:93.96
CV.1se	18.33	18.33	18.32	18.28	18.33			
CV.13c	18.14	18.15	18.20	18.18	18.14	18.14		$sd(\mu)/\sigma = 0.5$
AICc	18.1	18.22	18.29	18.23	10.17	10,17	18.10	$\rho = 0.9$
AIC	24.24	25.34	27.45	18.64			10.10	·
BIC	18.25	18.28	18.32	18.18				Oracle: 16.13
DIC	10.23	10.20	10.32	10.10				

Table 43: Estimation MSE for n=100, binary design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	0.99	0.94	1.06	0.53	0.87	
CV.min	0.59	0.63	0.84	0.51	0.62	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.72	0.67	0.54	0.56		$\rho = 0$
AIC	0.55	0.55	0.56	0.52		Oracle : 0.37
BIC	0.55	0.55	0.56	0.53		07466 . 0.57
CV.1se	0.97	0.92	0.99	0.49	0.83	
CV.min	0.58	0.60	0.79	0.46	0.59	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.69	0.64	0.48	0.52		$\rho = 0.5$
AIC	0.49	0.49	0.50	0.47		Oracle : 0.33
BIC	0.49	0.49	0.50	0.48		07466.0.55
CV.1se	0.93	0.89	0.96	0.47	0.80	
CV.min	0.56	0.59	0.78	0.44	0.58	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.67	0.63	0.46	0.50		$\rho = 0.9$
AIC	0.46	0.47	0.47	0.45		Oma ala . 0.21
BIC	0.46	0.47	0.47	0.46		Oracle: 0.31
CV.1se	2.18	2.18	2.20	1.79	2.17	
CV.min	1.91	2.00	2.13	2.03	1.93	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.91	1.92	2.21	1.73		$\rho = 0$
AIC	2.21	2.22	2.24	2.15		·
BIC	2.20	2.21	2.24	2.15		Oracle: 1.40
CV.1se	1.98	1.98	1.99	1.64	1.97	
CV.min	1.75	1.82	1.93	1.83	1.77	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.74	1.76	1.97	1.57		$\rho = 0.5$
AIC	1.98	1.99	2.01	1.93		
BIC	1.98	1.98	2.01	1.93		Oracle: 1.26
CV.1se	1.88	1.87	1.88	1.54	1.86	
CV.min	1.66	1.72	1.82	1.72	1.67	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.66	1.67	1.86	1.5		$\rho = 0.9$
AIC	1.87	1.88	1.90	1.83		
BIC	1.87	1.88	1.90	1.82		Oracle: 1.19
CV.1se	5.67	5.67	5.68	6.91	5.67	
CV.min	5.68	5.70	5.71	8.23	5.72	$sd(\mu)/\sigma = 0.5$
AICc	5.61	7.11	8.94	6.01		$\rho = 0$
AIC	8.88	8.93	9.00	8.74		,
BIC	8.87	8.92	9.00	8.73		Oracle: 5.30
CV.1se	5.08	5.08	5.08	6.21	5.08	
CV.min	5.09	5.11	5.11	7.39	5.13	$sd(\mu)/\sigma = 0.5$
AICc	5.03	6.20	7.98	5.41	0.10	$\rho = 0.5$
AIC	7.93	7.98	8.04	7.81		
BIC	7.93	7.97	8.04	7.81		Oracle: 4.74
CV.1se	4.82	4.83	4.83	5.84	4.83	
CV.13C	4.84	4.85	4.86	6.96	4.86	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.77	5.83	7.57	5.14	1.00	$\rho = 0.9$
AIC	7.53	7.57	7.63	7.41		
BIC	7.52	7.56	7.63	7.40		Oracle: 4.52
DIC	1.54	7.50	7.03	7.40		

Table 44: Estimation MSE for n=100, binary design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL		
CV.1se	7.33	7.44	7.46	3.26	7.34	
CV.min	5.91	6.93	7.27	2.95	5.82	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.28	3.35	3.02	4.31		$\rho = 0$
AIC	2.98	3.00	3.03	2.94		Oracle : 2.73
BIC	2.98	3.00	3.03	2.94		Oracic . 2.73
CV.1se	6.67	6.68	6.71	2.96	6.66	
CV.min	5.46	6.27	6.57	2.64	5.45	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.70	3.11	2.70	3.86		$\rho = 0.5$
AIC	2.67	2.68	2.71	2.63		Oracle : 2.45
BIC	2.67	2.68	2.71	2.63		Oracie . 2.43
CV.1se	6.28	6.30	6.35	2.89	6.29	
CV.min	5.24	5.94	6.21	2.51	5.27	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.46	3.15	2.55	3.77		$\rho = 0.9$
AIC	2.52	2.54	2.56	2.49		Oracle : 2.31
BIC	2.52	2.54	2.56	2.49		Oracie : 2.51
CV.1se	12.07	12.11	12.12	10.25	12.07	
CV.min	11.33	11.94	12.07	11.32	11.41	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.31	11.06	12.10	10.12		$\rho = 0$
AIC	11.96	12.05	12.14	11.78		
BIC	11.96	12.04	12.14	11.77		<i>Oracle</i> : 9.58
CV.1se	10.82	10.84	10.85	9.17	10.82	
CV.min	10.25	10.69	10.82	10.09	10.33	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.15	9.82	10.78	9.06		$\rho = 0.5$
AIC	10.66	10.73	10.82	10.49		
BIC	10.65	10.72	10.82	10.49		<i>Oracle</i> : 8.54
CV.1se	10.25	10.27	10.27	8.73	10.26	
CV.min	9.73	10.12	10.23	9.51	9.75	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	9.66	9.31	10.20	8.66		$\rho = 0.9$
AIC	10.09	10.16	10.24	9.93		
BIC	10.08	10.15	10.24	9.93		Oracle: 8.05
CV.1se	30.53	30.55	30.60	37.75	30.56	
CV.min	30.69	30.74	30.82	44.89	30.81	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	30.41	45.69	48.52	32.65		$\rho = 0$
AIC	47.87	48.29	48.60	47.19		
BIC	47.84	48.27	48.60	47.17		<i>Oracle</i> : 31.48
CV.1se	27.31	27.33	27.33	33.73	27.33	
CV.min	27.44	27.49	27.51	39.84	27.55	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	27.22	40.56	43.22	29.07		$\rho = 0.5$
AIC	42.66	43.03	43.30	42.06		,
BIC	42.64	43.01	43.30	42.04		Oracle: 28.08
CV.1se	25.85	25.87	25.88	31.38	25.87	
CV.min	26.00	25.97	26.03	37.38	26.07	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	25.67	38.25	40.92	27.59		$\rho = 0.9$
AIC	40.38	40.73	40.99	39.78		
BIC	40.36	40.71	40.99	39.76		Oracle : 26.61
	10.50	10.71	10.77	57.10		

Table 45: Estimation MSE for n=100, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL		
CV.1se	14.97	15.13	15.17	6.70	15.02	
CV.min	12.62	14.61	14.91	5.99	12.53	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	13.31	6.05	6.12	9.01		$\rho = 0$
AIC	6.04	6.08	6.13	5.96		Oracle : 6.12
BIC	6.04	6.08	6.13	5.96		07466.0.12
CV.1se	13.48	13.54	13.55	6.03	13.50	
CV.min	11.56	13.10	13.37	5.35	11.65	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	11.88	5.49	5.44	8.14		$\rho = 0.5$
AIC	5.37	5.41	5.45	5.31		Oracle : 5.45
BIC	5.37	5.41	5.45	5.3		Oracie : 5.45
CV.1se	12.74	12.81	12.84	5.92	12.80	
CV.min	10.99	12.38	12.67	5.11	10.93	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	11.29	5.27	5.17	7.86		$\rho = 0.9$
AIC	5.10	5.14	5.18	5.04		0
BIC	5.10	5.13	5.18	5.04		<i>Oracle</i> : 5.16
CV.1se	24.48	24.56	24.57	20.88	24.50	
CV.min	23.19	24.40	24.52	22.96	23.24	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	23.11	23.13	24.53	20.63		$\rho = 0$
AIC	24.21	24.42	24.58	23.85		
BIC	24.20	24.41	24.58	23.84		<i>Oracle</i> : 21.34
CV.1se	21.91	21.95	21.95	18.66	21.94	
CV.min	20.91	21.80	21.92	20.46	21.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	20.78	20.54	21.87	18.48		$\rho = 0.5$
AIC	21.58	21.76	21.91	21.26		
BIC	21.57	21.76	21.91	21.25		<i>Oracle</i> : 19.00
CV.1se	20.67	20.71	20.72	17.65	20.70	
CV.min	19.66	20.53	20.67	19.21	19.67	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	19.53	19.34	20.61	17.53		$\rho = 0.9$
AIC	20.35	20.51	20.66	20.05		
BIC	20.34	20.50	20.66	20.04		<i>Oracle</i> : 17.97
CV.1se	61.84	61.86	61.92	76.46	61.85	
CV.min	62.12	62.25	62.34	90.65	62.44	$sd(\mu)/\sigma = 0.5$
AICc	61.54	94.48	98.16	66.07	•	$\rho = 0$
AIC	96.74	97.74	98.25	95.38		
BIC	96.70	97.70	98.25	95.35		Oracle : 64.46
CV.1se	55.33	55.40	55.36	68.27	55.34	
CV.min	55.59	55.77	55.74	80.79	55.83	$sd(\mu)/\sigma = 0.5$
AICc	55.07	83.89	87.52	59.02		$\rho = 0.5$
AIC	86.29	87.15	87.62	85.08		
BIC	86.25	87.11	87.62	85.05		<i>Oracle</i> : 57.58
CV.1se	52.31	52.35	52.39	63.43	52.34	
CV.13c CV.min	52.51	52.62	52.66	75.65	52.69	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	51.93	79.08	82.74	55.84	02.00	$\rho = 0.9$
AIC	81.57	82.38	82.83	80.38		
BIC	81.52	82.35	82.83	80.28		<i>Oracle</i> : 54.48
	01.32	02.33	02.03	00.20		

Table 46: Estimation MSE for n=100, binary design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	30.33	30.56	30.60	13.61	30.38	
CV.min	26.07	29.77	30.17	12.06	25.72	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	27.01	12.04	12.33	18.27		$\rho = 0$
AIC	12.15	12.26	12.34	12		<i>Oracle</i> : 12.55
BIC	12.15	12.26	12.34	12		07 actc . 12.55
CV.1se	27.21	27.33	27.35	12.36	27.28	
CV.min	23.89	26.73	27.01	10.79	23.88	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	24.26	10.74	10.99	16.73		$\rho = 0.5$
AIC	10.83	10.93	11.00	10.7		Oracle : 11.21
BIC	10.83	10.92	11.00	10.7		07acie . 11.21
CV.1se	25.68	25.79	25.82	11.97	25.74	
CV.min	22.64	25.13	25.46	10.24	22.44	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	22.74	10.23	10.38	15.86		$\rho = 0.9$
AIC	10.24	10.33	10.39	10.12		Oracle: 10.60
BIC	10.23	10.32	10.39	10.12		Oracie: 10.00
CV.1se	49.21	49.37	49.37	42.14	49.29	
CV.min	46.77	49.09	49.30	46.25	46.84	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	46.69	47.26	49.34	41.64		$\rho = 0$
AIC	48.63	49.11	49.40	47.93		·
BIC	48.61	49.09	49.40	47.91		Oracle : 46.19
CV.1se	44.03	44.14	44.15	37.50	44.11	
CV.min	42.08	43.93	44.11	41.17	42.30	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	41.73	42.04	43.94	37.24		$\rho = 0.5$
AIC	43.31	43.73	43.99	42.68		,
BIC	43.29	43.72	43.99	42.67		Oracle: 41.04
CV.1se	41.58	41.69	41.70	35.58	41.60	
CV.min	39.52	41.37	41.58	38.66	39.66	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	39.23	39.74	41.49	35.18		$\rho = 0.9$
AIC	40.90	41.29	41.54	40.32		,
BIC	40.88	41.27	41.54	40.30		<i>Oracle</i> : 38.90
CV.1se	124.66	124.81	124.79	154.61	124.68	
CV.min	125.32	125.62	125.84	182.91	125.93	$sd(\mu)/\sigma = 0.5$
AICc	124.15	193.36	198.18	133.05		$\rho = 0$
AIC	195.19	197.42	198.29	192.44		·
BIC	195.11	197.36	198.28	192.34		Oracle: 130.14
CV.1se	111.25	111.38	111.34	136.84	111.28	
CV.min	111.79	112.04	112.02	162.37	112.21	$sd(\mu)/\sigma = 0.5$
AICc	110.75	171.44	176.10	118.55		$\rho = 0.5$
AIC	173.46	175.42	176.20	171.07		,
BIC	173.39	175.35	176.19	171.01		<i>Oracle</i> : 116.03
CV.1se	105.14	105.23	105.25	127.70	105.21	
CV.rise CV.min	105.41	105.68	105.77	152.09	105.93	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	104.31	161.77	166.42	112.41	100.70	$\rho = 0.9$
AIC	163.88	165.73	166.50	161.47		,
BIC	163.80	165.66	166.50	161.41		Oracle: 109.94
	103.00	103.00	100.50	101.71		

Table 47: Estimation MSE for n=100, continuous design, dense covariates, and decay 10.

$ \begin{array}{c} \mathrm{CV.lse} & 4.07 & 3.93 & 4.31 & 2.11 & 3.58 \\ \mathrm{CV.min} & 2.44 & 2.60 & 3.40 & 2.03 & 2.52 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlCc} & 2.89 & 3.36 & 2.23 & 2.24 & 2.10 & 0 \\ \mathrm{BIC} & 2.20 & 2.21 & 2.24 & 2.10 & 0 \\ \mathrm{CV.lse} & 2.01 & 1.97 & 1.89 & 1.04 & 1.82 \\ \mathrm{CV.min} & 1.54 & 1.55 & 1.68 & 0.84 & 1.44 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlCc} & 1.57 & 1.81 & 1.01 & 1.16 & \rho = 0.5 \\ \mathrm{AlC} & 0.83 & 0.84 & 0.84 & 0.82 & 0 \\ \mathrm{BIC} & 0.83 & 0.84 & 0.84 & 0.91 & 0 \\ \mathrm{CV.lse} & 0.40 & 0.39 & 0.34 & 0.29 & 0.37 \\ \mathrm{CV.lse} & 0.40 & 0.32 & 0.32 & 0.22 & 0.31 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlCc} & 0.32 & 0.32 & 0.32 & 0.22 & 0.31 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlC} & 0.32 & 0.32 & 0.32 & 0.22 & 0.31 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlC} & 0.22 & 0.22 & 0.22 & 0.2 & 0.2 & 0.22 \\ \mathrm{BIC} & 0.24 & 0.23 & 0.22 & 0.32 & 0.22 & 0.31 \\ \mathrm{CV.lse} & 8.82 & 8.80 & 8.92 & 7.23 & 8.80 \\ \mathrm{CV.min} & 7.73 & 8.04 & 8.56 & 8.16 & 7.76 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 7.66 & 8.50 & 8.88 & \textbf{6.93} & \rho = 0 \\ \mathrm{AlC} & 8.87 & 8.91 & 9.00 & 8.63 & 0 \\ \mathrm{CV.min} & 3.11 & 3.16 & 3.26 & 3.07 & 3.11 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 3.08 & 3.29 & 3.31 & \textbf{2.79} & \rho = 0.5 \\ \mathrm{AlC} & 3.35 & 3.36 & 3.39 & 3.28 & 0 \\ \mathrm{CV.min} & 3.11 & 3.16 & 3.26 & 3.07 & 3.11 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 3.08 & 3.29 & 3.31 & \textbf{2.79} & \rho = 0.5 \\ \mathrm{AlC} & 3.35 & 3.36 & 3.39 & 3.28 & 0 \\ \mathrm{CV.min} & 0.71 & 0.71 & 0.69 & 0.70 & 0.69 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 0.70 & 0.74 & 0.71 & \textbf{0.68} & \rho = 0.5 \\ \mathrm{AlC} & 0.89 & 0.89 & 0.91 & 0.70 & 0.69 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.11 & 35.06 & 0 \\ \mathrm{BlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \mathrm{AlC} & 3.5.9 & 35.80 & 36.10 & 35.04 & 22.94 & \mathrm$		lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
AICc 2.89 3.36 2.23 2.24 $\rho = 0$ AIC 2.20 2.21 2.24 2.10 $\rho = 0$ BIC 2.20 2.20 2.23 2.15 $\rho = 0$ CV.lse 2.01 1.97 1.89 1.04 1.82 $\rho = 0$ CV.lse 2.01 1.97 1.89 1.04 1.82 $\rho = 0$ AIC 1.57 1.81 1.01 1.16 $\rho = 0$ AIC 0.83 0.84 0.84 0.84 0.82 $\rho = 0$ BIC 0.83 0.84 0.84 0.91 $\rho = 0$ CV.lise 0.40 0.39 0.34 0.29 0.37 $\rho = 0$ CV.lise 0.40 0.39 0.32 0.32 0.22 0.31 $\rho = 0$ AIC 0.32 0.35 0.33 0.25 $\rho = 0$ AIC 0.22 0.22 0.22 0.22 0.2 $\rho = 0$ BIC 0.24 0.23 0.22 0.35 0.32 0.22 0.31 $\rho = 0$ CV.lise 8.82 8.80 8.92 7.23 8.80 $\rho = 0$ CV.lise 8.87 8.91 9.00 8.63 $\rho = 0$ BIC 8.87 8.91 9.00 8.63 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.36 2.83 3.36 $\rho = 0$ CV.lise 3.39 3.38 3.30 2.89 3.31 2.79 $\rho = 0$ AIC 3.56 3.39 3.39 3.27 $\rho = 0$ CV.lise 3.50 3.50 3.50 3.39 3.27 $\rho = 0$ CV.lise 3.50 3.50 3.50 3.39 3.27 $\rho = 0$ CV.lise 0.84 0.82 0.74 0.72 0.79 $\rho = 0$ CV.lise 0.89 0.89 0.91 0.80 $\rho = 0$ BIC 0.89 0.89 0.91 0.80 $\rho = 0$ AIC 0.89 0.89 0.91 0.80 $\rho = 0$ AIC 3.56 3.581 3.511 35.06 $\rho = 0$ AIC 3.561 35.81 36.11 35.06 $\rho = 0$ AIC 3.57 3.581 36.11 35.06 $\rho = 0$ AIC 3.581 3.581 36.11 35.06 $\rho = 0$ AIC 3.582 8.59 8.59 8.60 10.06 8.59 $\rho = 0$ AIC 3.59 3.580 3.580 3.510 35.04 $\rho = 0$ CV.lise 2.33 2.32 2.32 2.32 2.29 2.32 $\rho = 0$ CV.lise 2.33 2.33 2.32 2.32 2.32 2.29 2.32 $\rho = 0$ AIC 3.61 3.62 3.67 3.44 $\rho = 0$ AIC 3.61 3.62 3.67 3.44 $\rho = 0$	CV.1se						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min					2.52	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 2.20 2.20 2.23 2.15 Oracle: 1.48 CV.Ise 2.01 1.97 1.89 1.04 1.82 CV.min 1.54 1.55 1.68 0.84 1.44 $sd(\mu)/\sigma = 2$ AIC 1.57 1.81 1.01 1.16 $\rho = 0.5$ AIC 0.83 0.84 0.84 0.82 Oracle: 0.56 CV.Ise 0.40 0.39 0.34 0.29 0.37 cV.min CV.min 0.32 0.32 0.32 0.22 0.32 o.25 $\rho = 0.9$ AIC 0.32 0.35 0.33 0.25 $\rho = 0.9$ $\rho = 0.9$ AIC 0.22 0.22 0.22 0.22 $\rho = 0.9$ V.Ise 8.82 8.80 8.92 7.23 8.80 $\rho = 0.9$ V.Ise 8.82 8.80 8.92 7.23 8.80 $\rho = 0.9$ AIC 7.66 8.50 8.88 6.93 $\rho = 0.0$ $\rho = 0.0$							$\rho = 0$
BIC 2.20 2.20 2.23 2.15 CV.Ise 2.01 1.97 1.89 1.04 1.82 CV.min 1.54 1.55 1.68 0.84 1.44 $sd(\mu)/\sigma = 2$ AIC 0.83 0.84 0.84 0.82 Oracle : 0.56 CV.Ise 0.40 0.39 0.34 0.29 0.37 CV.min 0.32 0.32 0.32 0.22 0.31 $sd(\mu)/\sigma = 2$ AIC 0.32 0.35 0.33 0.25 $\rho = 0.9$ AIC 0.22 0.22 0.22 0.22 Oracle : 0.15 CV.Ise 8.82 8.80 8.92 7.23 8.80 $ccolor (\mu)/\sigma = 1$ AIC 7.66 8.50 8.88 6.93 $ccolor (\mu)/\sigma = 1$ $ccolor (\mu)/\sigma = 1$ AIC 8.87 8.91 9.00 8.65 $ccolor (\mu)/\sigma = 1$ AIC 8.87 8.91 9.00 8.63 $ccolor (\mu)/\sigma = 1$ AIC 3.03 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Oracle · 1.48</td>							Oracle · 1.48
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		2.20					074666.1.40
AICc 1.57 1.81 1.01 1.16 $\rho = 0.5$ AIC 0.83 0.84 0.84 0.82 $\rho = 0.5$ BIC 0.83 0.84 0.84 0.91 $\rho = 0.5$ Oracle : 0.56 $\rho = 0.5$ CV. Ise 0.40 0.39 0.34 0.29 0.37 $\rho = 0.9$ AIC 0.22 0.32 0.32 0.32 0.22 0.31 $\rho = 0.9$ AIC 0.24 0.23 0.22 0.32 0.32 $\rho = 0.9$ Oracle : 0.15 $\rho = 0.9$ AIC 0.24 0.23 0.22 0.32 $\rho = 0.9$ AIC 0.25 $\rho = 0.9$ AIC 0.26 8.50 8.88 6.93 $\rho = 0.9$ AIC 8.87 8.91 9.00 8.65 $\rho = 0.9$ AIC 3.35 3.36 3.39 3.36 0.37 3.11 $\rho = 0.9$ AIC 3.35 3.36 3.39 3.27 $\rho = 0.9$ AIC 0.84 0.82 0.74 0.72 0.79 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.70 0.69 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.70 0.80 BIC 0.89 0.89 0.91 0.70 0.70 0.70 0.70 0.70 0.70 0.70 0.7		2.01	1.97	1.89	1.04	1.82	
AIC 0.83 0.84 0.84 0.84 0.91 CV.1se 0.40 0.39 0.34 0.29 0.37 CV.min 0.32 0.32 0.32 0.32 0.22 0.21 AIC 0.22 0.22 0.22 0.22 0.2 BIC 0.24 0.23 0.22 0.32 CV.min 7.73 8.04 8.56 8.16 7.76 $sd(\mu)/\sigma = 1$ AIC 8.87 8.91 9.00 8.65 BIC 8.87 8.91 9.00 8.65 CV.lse 3.39 3.38 3.36 2.83 3.36 CV.min 3.11 3.16 3.26 3.07 3.11 $sd(\mu)/\sigma = 1$ AIC 3.35 3.36 3.39 3.28 CV.min 3.5 3.36 3.39 3.27 CV.lse 0.84 0.82 0.74 0.72 0.79 CV.lse 0.84 0.82 0.74 0.71 0.68 AIC 0.70 0.74 0.71 0.69 0.70 0.69 $sd(\mu)/\sigma = 1$ AIC 0.70 0.74 0.71 0.69 0.70 0.69 $sd(\mu)/\sigma = 1$ AIC 0.89 0.89 0.91 0.80 BIC 0.89 0.89 0.91 0.80 CV.lse 2.283 22.84 22.85 27.74 22.85 CV.lse 2.253 24.53 35.87 24.03 AIC 3.55 3.58 8.59 8.60 10.06 8.59 CV.lse 8.59 8.59 8.60 10.06 8.59 CV.lse 8.39 13.44 13.56 13.17 BIC 13.38 13.44 13.56 13.17 BIC 2.24 2.28 3 2.29 2.53 2.26 AIC 2.24 2.28 3.11 2.34 CV.min 2.26 2.26 2.29 2.53 2.26 AIC 2.24 2.28 3.11 2.34 AIC 3.61 3.62 3.67 3.44 Oracle : 2.11	CV.min					1.44	
BIC 0.83 0.84 0.84 0.91							$\rho = 0.5$
BIC 0.83 0.84 0.84 0.91 CV.1se 0.40 0.39 0.34 0.29 0.37 CV.min 0.32 0.32 0.32 0.22 0.21 AICc 0.32 0.35 0.33 0.25 $\rho = 0.9$ AIC 0.22 0.22 0.22 0.22 0.72 CV.Ise 8.82 8.80 8.92 7.23 8.80 CV.min 7.73 8.04 8.56 8.16 7.76 sd(μ)/ σ = 1 AIC 8.87 8.91 9.00 8.65 0.00 <	AIC	0.83	0.84	0.84	0.82		$O_{raclo} \cdot 0.56$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC						07466 . 0.30
AICc 0.32 0.35 0.33 0.25 $\rho = 0.9$ AIC 0.22 0.22 0.22 0.22 0.32 $\rho_{\rm c} = 0.9$ BIC 0.24 0.23 0.22 0.32 $\rho_{\rm c} = 0.9$ Oracle : 0.15 $\rho = 0.9$ AIC 8.87 8.91 9.00 8.65 $\rho = 0.9$ Oracle : 5.62 $\rho = 0.9$ Oracle : 0.24 $\rho = 0.9$ Oracle : 0.26 $\rho = 0.9$ Oracle : 0.27 $\rho = 0.9$ Oracle : 0.28 $\rho = 0.9$ Oracle : 0.28 $\rho = 0.9$ Oracle : 0.29 $\rho = 0.9$ Oracle : 0.29 $\rho = 0.9$ Oracle : 0.29 $\rho = 0.9$ Oracle : 0.21 $\rho = 0.9$ Oracle : 0.29 $\rho = 0.9$ Oracle : 0.25 $\rho = 0.9$ Oracle : 0.26 $\rho = 0.9$ Oracle : 0.29 $\rho = 0.9$ Oracle : 0.29 $\rho = 0.9$ Oracle : 0.20 $\rho =$	CV.1se	0.40	0.39	0.34	0.29	0.37	
AIC 0.22 0.22 0.22 0.32	CV.min	0.32		0.32	0.22	0.31	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 0.24 0.23 0.22 0.32	AICc	0.32	0.35	0.33			$\rho = 0.9$
BIC 0.24 0.23 0.22 0.32 CV.1se 8.82 8.80 8.92 7.23 8.80 CV.min 7.73 8.04 8.56 8.16 7.76 sd(μ)/σ = 1 AIC 8.87 8.91 9.00 8.65 Oracle : 5.62 CV.lse 3.39 3.38 3.36 2.83 3.36 CV.min 3.11 3.16 3.26 3.07 3.11 sd(μ)/σ = 1 AIC 3.08 3.29 3.31 2.79 ρ = 0.5 AIC 3.35 3.36 3.39 3.28 Oracle : 2.11 CV.nin 3.35 3.36 3.39 3.27 Oracle : 2.11 CV.1se 0.84 0.82 0.74 0.72 0.79 cv.min CV.min 0.71 0.71 0.69 0.70 0.69 sd(μ)/σ = 1 AIC 0.89 0.89 0.91 0.80 Oracle : 0.56 CV.lse 22.83 22.84 22	AIC	0.22	0.22	0.22			$O_{racle} \cdot 0.15$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.24	0.23	0.22			01466 . 0.13
AICc 7.66 8.50 8.88 6.93 $\rho = 0$ AIC 8.87 8.91 9.00 8.65 BIC 8.87 8.91 9.00 8.63 CV.1se 3.39 3.38 3.36 2.83 3.36 CV.min 3.11 3.16 3.26 3.07 3.11 $sd(\mu)/\sigma = 1$ AICc 3.08 3.29 3.31 2.79 $\rho = 0.5$ AIC 3.35 3.36 3.39 3.28 BIC 3.35 3.36 3.39 3.27 CV.1se 0.84 0.82 0.74 0.72 0.79 CV.min 0.71 0.71 0.69 0.70 0.69 $sd(\mu)/\sigma = 1$ AICc 0.70 0.74 0.71 0.68 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.80 BIC 0.89 0.89 0.91 0.70 CV.1se 22.83 22.84 22.85 27.74 22.85 CV.min 22.87 22.91 23.01 33.04 22.94 $sd(\mu)/\sigma = 0.5$ AIC 35.61 35.81 36.11 35.06 BIC 35.59 35.80 36.10 35.04 CV.1se 8.59 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $sd(\mu)/\sigma = 0.5$ AIC 8.52 8.61 13.38 9.09 AIC 13.39 13.44 13.56 13.17 BIC 13.38 13.44 13.56 13.15 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AIC 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44	CV.1se	8.82	8.80	8.92	7.23	8.80	
AIC 8.87 8.91 9.00 8.65 $Oracle: 5.62$ $Oracle: 7.97$ $Oracle: 7.97$ $Oracle: 7.97$ $Oracle: 7.97$ $Oracle: 7.97$ $Oracle: 7$	CV.min	7.73	8.04	8.56	8.16	7.76	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 8.87 8.91 9.00 8.63 $Oracle : 5.62$ CV.1se 3.39 3.38 3.36 2.83 3.36 $CV.min$ 3.11 3.16 3.26 3.07 3.11 $sd(\mu)/\sigma = 1$ AICc 3.08 3.29 3.31 2.79 $\rho = 0.5$ AIC 3.35 3.36 3.39 3.28 $Oracle : 2.11$ CV.1se 0.84 0.82 0.74 0.72 0.79 $CV.min$ 0.71 0.71 0.69 0.70 0.69 $sd(\mu)/\sigma = 1$ AICc 0.70 0.74 0.71 0.68 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.80 $Oracle : 0.56$ BIC 0.89 0.89 0.91 0.70 $Oracle : 0.56$ CV.1se 22.83 22.84 22.85 27.74 22.85 $CV.min$ 22.87 22.91 23.01 33.04 22.94 $sd(\mu)/\sigma = 0.5$ AIC 35.61 35.81 36.11 35.06 $Oracle : 0.56$ BIC 35.59 35.80 36.10 35.04 $Oracle : 0.56$ CV.1se 8.59 8.59 8.60 10.06 8.59 $Oracle : 0.56$ CV.1se 8.52 8.61 13.38 9.09 $Oracle : 0.56$ AICc 8.52 8.61 13.38 9.09 $Oracle : 0.56$ CV.1se 2.33 2.32 2.32 2.29 2.32 $CV.min$ 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AICC 13.39 13.44 13.56 13.17 $Oracle : 7.97$ CV.1se 2.33 2.32 2.32 2.29 2.32 $CV.min$ 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AICC 2.24 2.28 3.11 2.34 $Oracle : 2.11$	AICc	7.66	8.50	8.88	6.93		$\rho = 0$
BIC 8.87 8.91 9.00 8.63 CV.Ise 3.39 3.38 3.36 2.83 3.36 CV.min 3.11 3.16 3.26 3.07 3.11 $sd(\mu)/\sigma = 1$ AIC 3.08 3.29 3.31 2.79 $\rho = 0.5$ AIC 3.35 3.36 3.39 3.27 CV.Ise 0.84 0.82 0.74 0.72 0.79 CV.min 0.71 0.71 0.69 0.70 0.69 $sd(\mu)/\sigma = 1$ AIC 0.89 0.89 0.91 0.80 0.69 $sd(\mu)/\sigma = 0.5$ AIC 0.89 0.89 0.91 0.70 0.69 $sd(\mu)/\sigma = 0.5$ CV.1se 22.83 22.84 22.85 27.74 22.85 cv CV.min 22.87 22.91 23.01 33.04 22.94 $sd(\mu)/\sigma = 0.5$ AIC 35.61 35.81 36.11 35.06 0racle : 21.25 CV.1se 8.59	AIC	8.87	8.91	9.00	8.65		Omasla . 5.62
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	8.87	8.91	9.00	8.63		Oracie : 5.02
AICc 3.08 3.29 3.31 2.79 $\rho = 0.5$ AIC 3.35 3.36 3.39 3.28 $\rho = 0.5$ BIC 3.35 3.36 3.39 3.27 $\rho = 0.5$ CV.1se 0.84 0.82 0.74 0.72 0.79 CV.min 0.71 0.71 0.69 0.70 0.69 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.80 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.70 $\rho = 0.9$ CV.min 22.87 22.91 23.01 33.04 22.94 $\rho = 0.9$ AIC 35.61 35.81 36.11 35.06 BIC 35.59 35.80 36.10 35.04 $\rho = 0.5$ AIC 8.59 8.59 8.60 10.06 8.59 $\rho = 0.5$ AIC 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.15 $\rho = 0.5$ AIC 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44	CV.1se	3.39	3.38	3.36	2.83	3.36	
AIC 3.35 3.36 3.39 3.28 $Oracle: 2.11$ CV.1se 0.84 0.82 0.74 0.72 0.79 $Oracle: 2.11$ CV.min 0.71 0.71 0.69 0.70 0.69 $Oracle: 2.11$ AIC 0.89 0.89 0.91 0.80 $Oracle: 2.11$ CV.1se 22.83 22.84 22.85 27.74 22.85 $Oracle: 2.11$ CV.min 22.87 22.91 23.01 33.04 22.94 $Oracle: 2.11$ AIC 35.61 35.81 36.11 35.06 $Oracle: 2.12$ BIC 35.59 35.80 36.10 35.04 CV.1se 8.59 8.59 8.60 10.06 8.59 $Oracle: 2.12$ CV.min 8.58 8.59 8.64 12.07 8.62 $Oracle: 2.12$ AIC 13.39 13.44 13.56 13.17 $Oracle: 7.97$ BIC 13.38 13.44 13.56 13.15 $Oracle: 7.97$ CV.1se 2.33 2.32 2.32 2.29 2.32 $Oracle: 7.97$ AIC 2.24 2.28 3.11 2.34 $Oracle: 2.11$	CV.min	3.11	3.16	3.26		3.11	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 3.35 3.36 3.39 3.27 CV.1se 0.84 0.82 0.74 0.72 0.79 CV.min 0.71 0.71 0.69 0.70 0.69 AICc 0.70 0.74 0.71 0.68	AICc	3.08	3.29	3.31	2.79		$\rho = 0.5$
BIC 3.35 3.36 3.39 3.27 CV.1se 0.84 0.82 0.74 0.72 0.79 CV.min 0.71 0.69 0.70 0.69 $sd(\mu)/\sigma = 1$ AICc 0.70 0.74 0.71 0.68 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.80 Oracle : 0.56 CV.1se 22.83 22.84 22.85 27.74 22.85 CV.min 22.87 22.91 23.01 33.04 22.94 $sd(\mu)/\sigma = 0.5$ AIC 35.61 35.81 36.11 35.06 Oracle : 21.25 BIC 35.59 35.80 36.10 35.04 Oracle : 21.25 CV.1se 8.59 8.60 10.06 8.59 $sd(\mu)/\sigma = 0.5$ AIC 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.38 13.44 13.56 13.17 Oracle : 7.97 BIC 13.38 13.44 13.56 13.15	AIC	3.35	3.36	3.39	3.28		Omagle : 2.11
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	3.35	3.36	3.39	3.27		07466.2.11
AICc 0.70 0.74 0.71 0.68 $\rho = 0.9$ AIC 0.89 0.89 0.91 0.70 $\rho = 0.9$ Oracle : 0.56 BIC 0.89 0.89 0.91 0.70 $\rho = 0.5$ CV.1se 22.83 22.84 22.85 27.74 22.85 CV.min 22.87 22.91 23.01 33.04 22.94 $\rho = 0.5$ AICc 22.53 24.53 35.87 24.03 $\rho = 0.5$ AIC 35.61 35.81 36.11 35.06 BIC 35.59 35.80 36.10 35.04 $\rho = 0.5$ CV.1se 8.59 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $\rho = 0.5$ AICc 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 $\rho = 0.5$ AIC 13.38 13.44 13.56 13.15 $\rho = 0.5$ AIC 13.38 13.44 13.56 13.15 $\rho = 0.5$ AIC 13.39 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $\rho = 0.5$ AICc 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44	CV.1se	0.84	0.82	0.74	0.72	0.79	
AIC 0.89 0.89 0.91 0.70 $Oracle : 0.56$ $Oracle : 0.57$ Ora	CV.min	0.71	0.71	0.69	0.70	0.69	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 0.89 0.89 0.91 0.70 Oracle: 0.36 CV.1se 22.83 22.84 22.85 27.74 22.85 $cc{3.36}$	AICc	0.70	0.74	0.71	0.68		$\rho = 0.9$
BIC 0.89 0.89 0.91 0.70 CV.1se 22.83 22.84 22.85 27.74 22.85 CV.min 22.87 22.91 23.01 33.04 22.94 $sd(\mu)/\sigma = 0.5$ AICc 22.53 24.53 35.87 24.03 $\rho = 0$ AIC 35.61 35.81 36.11 35.06 Oracle: 21.25 CV.1se 8.59 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $sd(\mu)/\sigma = 0.5$ AICc 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 Oracle: 7.97 BIC 13.38 13.44 13.56 13.15 Oracle: 7.97 CV.1se 2.33 2.32 2.29 2.32 $sd(\mu)/\sigma = 0.5$ AIC 3.61 3.62 3.67 3.44 $sd(\mu)/\sigma = 0.5$ AIC 3.61 3.62 3.67	AIC	0.89	0.89	0.91	0.80		Omasla : 0.56
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.89	0.89	0.91	0.70		Oracie : 0.30
AICc 22.53 24.53 35.87 24.03 $\rho = 0$ AIC 35.61 35.81 36.11 35.06 BIC 35.59 35.80 36.10 35.04 CV.1se 8.59 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $sd(\mu)/\sigma = 0.5$ AICc 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 BIC 13.38 13.44 13.56 13.15 CV.1se 2.33 2.32 2.32 2.29 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AICc 3.61 3.62 3.67 3.44	CV.1se	22.83	22.84	22.85	27.74	22.85	
AIC 35.61 35.81 36.11 35.06 BIC 35.59 35.80 36.10 35.04 $Oracle: 21.25$ CV.1se 8.59 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $oldsymbol{sd}(\mu)/\sigma = 0.5$ AICc 8.52 8.61 13.38 9.09 $oldsymbol{sd}(\mu)/\sigma = 0.5$ AIC 13.39 13.44 13.56 13.17 $oldsymbol{oracle}(\pi)$ BIC 13.38 13.44 13.56 13.15 $oldsymbol{oracle}(\pi)$ CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $oldsymbol{sd}(\mu)/\sigma = 0.5$ AICc 2.24 2.28 3.11 2.34 $oldsymbol{oracle}(\pi)$ AIC 3.61 3.62 3.67 3.44	CV.min	22.87	22.91	23.01	33.04	22.94	$\operatorname{sd}(\mu)/\sigma = 0.5$
BIC 35.59 35.80 36.10 35.04 Oracle: 21.25 CV.1se 8.59 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $sd(\mu)/\sigma = 0.5$ AICc 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 Oracle: 7.97 BIC 13.38 13.44 13.56 13.15 Oracle: 7.97 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AICc 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44 Oracle: 2.11	AICc	22.53	24.53	35.87	24.03		$\rho = 0$
BIC 35.59 35.80 36.10 35.04 CV.1se 8.59 8.60 10.06 8.59 CV.min 8.58 8.59 8.64 12.07 8.62 $sd(\mu)/\sigma = 0.5$ AICc 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 Oracle: 7.97 BIC 13.38 13.44 13.56 13.15 Oracle: 7.97 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AICc 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44 Oracle: 2.11	AIC	35.61	35.81	36.11	35.06		Orgalo : 21 25
CV.min 8.58 8.59 8.64 12.07 8.62 $sd(\mu)/\sigma = 0.5$ AIC 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 Oracle: 7.97 BIC 13.38 13.44 13.56 13.15 Oracle: 7.97 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AIC 3.61 3.62 3.67 3.44 Oracle: 2.11	BIC	35.59	35.80	36.10	35.04		07 acte . 21.23
AICc 8.52 8.61 13.38 9.09 $\rho = 0.5$ AIC 13.39 13.44 13.56 13.17 $\rho = 0.5$ Oracle : 7.97 BIC 13.38 13.44 13.56 13.15 $\rho = 0.5$ CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $\rho = 0.5$ AICc 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44 $\rho = 0.9$ $\rho = 0.9$ $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44	CV.1se	8.59	8.59	8.60	10.06	8.59	
AIC 13.39 13.44 13.56 13.17 Oracle: 7.97 BIC 13.38 13.44 13.56 13.15 Oracle: 7.97 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(μ)/σ = 0.5$ AICc 2.24 2.28 3.11 2.34 $ρ = 0.9$ AIC 3.61 3.62 3.67 3.44 Oracle: 2.11	CV.min	8.58	8.59	8.64	12.07	8.62	$\operatorname{sd}(\mu)/\sigma = 0.5$
BIC 13.38 13.44 13.56 13.15 Oracle: 7.97 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AICc 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44 Oracle: 2.11	AICc	8.52	8.61	13.38	9.09		$\rho = 0.5$
BIC 13.38 13.44 13.56 13.15 CV.1se 2.33 2.32 2.32 2.29 2.32 CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AIC 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44 Oracle : 2.11	AIC	13.39	13.44	13.56	13.17		Oracle : 7.07
CV.min 2.26 2.26 2.29 2.53 2.26 $sd(\mu)/\sigma = 0.5$ AIC 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44	BIC	13.38	13.44	13.56	13.15		Oracle : 1.91
AICc 2.24 2.28 3.11 2.34 $\rho = 0.9$ AIC 3.61 3.62 3.67 3.44	CV.1se	2.33	2.32	2.32	2.29	2.32	
AIC 3.61 3.62 3.67 3.44 Oracle : 2.11	CV.min	2.26	2.26	2.29	2.53	2.26	$\operatorname{sd}(\mu)/\sigma = 0.5$
+ 1 1 1 1 1 1 1 1 1 1	AICc	2.24	2.28	3.11	2.34		$\rho = 0.9$
BIC 3.60 3.62 3.67 2.66	AIC	3.61	3.62	3.67	3.44		Oracle · 2 11
	BIC	3.60	3.62	3.67	2.66		

Table 48: Estimation MSE for n=100, continuous design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	29.84	30.21	30.39	13.26	29.97	
CV.min	24.06	28.29	29.64	11.90	24.04	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.41	22.67	12.22	17.14		$\rho = 0$
AIC	12.07	12.15	12.26	11.89		Oracle: 11.08
BIC	12.07	12.14	12.26	11.88		074666.11.00
CV.1se	10.41	10.41	10.42	5.40	10.39	
CV.min	9.40	9.94	10.30	4.26	9.42	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	9.31	10.16	4.16	6.64		$\rho = 0.5$
AIC	4.13	4.15	4.18	4.09		Oracle: 3.78
BIC	4.13	4.14	4.18	4.08		Oracie . 5.76
CV.1se	1.88	1.86	1.83	1.54	1.85	
CV.min	1.60	1.61	1.69	1.12	1.59	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.55	1.78	1.31	1.26		$\rho = 0.9$
AIC	0.75	0.75	0.76	0.74		01069
BIC	0.75	0.75	0.76	1.38		Oracle: 0.68
CV.1se	48.97	49.08	49.11	41.41	49.03	
CV.min	46.03	48.36	48.95	45.64	46.16	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	45.69	46.15	48.71	40.67		$\rho = 0$
AIC	48.15	48.51	48.87	47.37		,
BIC	48.13	48.49	48.86	47.35		<i>Oracle</i> : 38.53
CV.1se	16.82	16.83	16.85	14.38	16.81	
CV.min	16.23	16.58	16.82	15.44	16.19	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	16.03	16.57	16.64	14.36		$\rho = 0.5$
AIC	16.54	16.62	16.77	16.30		
BIC	16.53	16.61	16.76	16.29		<i>Oracle</i> : 13.23
CV.1se	3.06	3.06	3.06	2.82	3.06	
CV.min	2.89	2.90	2.99	2.61	2.88	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.83	3.01	2.98	2.64		$\rho = 0.9$
AIC	2.99	3.00	3.04	2.88		
BIC	2.99	3.00	3.04	2.87		Oracle: 2.37
CV.1se	123.67	123.68	123.80	151.41	123.69	
CV.min	124.09	124.31	124.59	180.32	125.12	$sd(\mu)/\sigma = 0.5$
AICc	122.78	181.19	195.40	131.22		$\rho = 0$
AIC	192.75	194.48	195.68	189.98		-
BIC	192.67	194.40	195.66	189.91		Oracle: 126.96
CV.1se	42.38	42.39	42.42	49.61	42.42	
CV.min	42.56	42.60	42.70	59.52	42.68	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	42.17	50.84	66.80	45.06	12.00	$\rho = 0.5$
AIC	66.10	66.57	67.06	65.12		·
BIC	66.07	66.53	67.05	65.09		Oracle : 43.47
CV.1se	7.73	7.73	7.74	7.84	7.73	
CV.13C CV.min	7.73	7.73	7.78	8.64	7.74	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	7.71 7.66	7.73	12.06	8.10	7.74	$\rho = 0.9$
AIC	11.97	12.05	12.00	11.58		·
BIC	11.96	12.05	12.19	10.18		Oracle: 7.75
ВіС	11.90	12.03	12.10	10.10		

Table 49: Estimation MSE for n=100, continuous design, dense covariates, and decay 100.

$ \begin{array}{c} \mathrm{CV.lse} & 61.16 & 61.57 & 61.63 & 27.47 & 61.23 \\ \mathrm{CV.min} & 51.50 & 59.56 & 60.70 & 24.23 & 51.80 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlCc} & 53.49 & 32.73 & 24.78 & 36.31 & \rho = 0 \\ \mathrm{AlC} & 24.45 & 24.64 & 24.82 & 24.13 & Oracle : 24.83 \\ \mathrm{CV.lse} & 20.83 & 20.84 & 20.86 & 10.87 & 20.84 \\ \mathrm{CV.min} & 19.15 & 20.19 & 20.68 & 8.57 & 19.09 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlCc} & 18.93 & 18.83 & 8.35 & 13.38 & \rho = 0.5 \\ \mathrm{AlC} & 8.26 & 8.30 & 8.37 & 8.21 & Oracle : 8.37 \\ \mathrm{CV.lse} & 3.54 & 3.54 & 3.53 & 3.00 & 3.54 \\ \mathrm{CV.min} & 3.20 & 3.27 & 3.41 & 2.17 & 3.21 & \mathrm{sd}(\mu)/\sigma = 2 \\ \mathrm{AlCc} & 3.11 & 3.48 & 1.60 & 2.48 & \rho = 0.9 \\ \mathrm{AlC} & 1.40 & 1.40 & 1.42 & 1.38 & Oracle : 1.42 \\ \mathrm{CV.lse} & 99.62 & 99.74 & 99.82 & 84.51 & 99.66 \\ \mathrm{CV.min} & 94.55 & 98.98 & 99.72 & 92.58 & 94.75 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlC} & 93.78 & 93.69 & 99.07 & 83.67 & \rho = 0 \\ \mathrm{BIC} & 97.71 & 98.58 & 99.27 & 96.27 & Oracle : 86.46 \\ \mathrm{CV.lie} & 33.64 & 33.24 & 33.31 & 33.69 & 30.80 & 32.52 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 33.02 & 33.24 & 33.34 & 32.53 & Oracle : 29.19 \\ \mathrm{CV.min} & 32.47 & 33.31 & 33.69 & 30.80 & 32.52 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 33.02 & 33.24 & 33.34 & 32.53 & Oracle : 29.19 \\ \mathrm{CV.min} & 5.53 & 5.59 & 5.70 & 4.97 & 5.53 & \mathrm{sd}(\mu)/\sigma = 1 \\ \mathrm{AlCc} & 5.58 & 5.61 & 5.68 & 5.44 & Oracle : 4.90 \\ \mathrm{CV.min} & 25.98 & 250.88 & 251.03 & 30.99 & 251.08 \\ \mathrm{CV.min} & 25.98 & 250.88 & 251.03 & 30.99 & 251.08 \\ \mathrm{CV.lie} & 390.99 & 395.04 & 397.25 & 385.61 & Oracle : 4.90 \\ \mathrm{CV.lie} & 390.99 & 395.04 & 397.25 & 385.61 & Oracle : 260.93 \\ \mathrm{BIC} & 31.18 & 313.294 & 133.82 & 129.89 & Oracle : 260.93 \\ \mathrm{CV.lie} & 34.44 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.lie} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.lie} & 14.49 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.min} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.lie} & 14.49 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.lie} & 131.76 & 132.88 & 133.81 & 129.82 & Oracle : 87.87 \\ \mathrm{CV.lie} & 14.49 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.min} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 \\ \mathrm{CV.min} & 14.44 & 14.44$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	marginal AL	sparsenet MCP	
AICc 53.49 32.73 24.78 36.31 $\rho = 0$ AIC 24.45 24.64 24.82 24.13 $\rho = 0$ BIC 24.44 24.63 24.82 24.14 $\rho = 0$ CV.lse 20.83 20.84 20.86 10.87 20.84 $\rho = 0$ CV.lse 20.83 18.83 8.35 13.38 $\rho = 0$ AICc 18.93 18.83 8.35 13.38 $\rho = 0$ AIC 8.26 8.30 8.37 8.18 $\rho = 0$ BIC 8.25 8.30 8.37 8.21 $\rho = 0$ CV.lse 3.54 3.54 3.53 3.00 3.54 $\rho = 0$ CV.min 3.20 3.27 3.41 2.17 3.21 $\rho = 0$ AIC 1.40 1.40 1.42 1.38 $\rho = 0$ BIC 1.40 1.40 1.42 1.38 $\rho = 0$ BIC 1.40 1.40 1.42 1.38 $\rho = 0$ BIC 97.71 98.58 99.72 92.58 94.75 $\rho = 0$ AIC 93.78 93.69 99.07 83.67 $\rho = 0$ AIC 93.78 93.69 99.07 83.67 $\rho = 0$ AIC 97.75 98.62 99.27 96.27 $\rho = 0$ BIC 97.71 98.58 99.26 96.23 $\rho = 0$ CV.min 32.47 33.31 33.69 30.80 32.52 $\rho = 0$ AIC 33.02 33.24 33.49 32.55 $\rho = 0$ BIC 33.00 33.24 33.49 32.55 $\rho = 0$ AIC 33.02 33.24 33.49 32.55 $\rho = 0$ AIC 5.58 5.61 5.68 5.42 $\rho = 0$ AIC 5.58 5.61 5.68 5.42 $\rho = 0$ AIC 249.33 381.45 396.79 26.84 $\rho = 0$ AIC 39.99 395.04 397.25 385.41 $\rho = 0$ AIC 39.99 395.04 397.25 385.41 $\rho = 0$ AIC 39.99 395.04 397.28 385.61 $\rho = 0$ AIC 39.99 395.04 397.25 385.45 $\rho = 0$ AIC 39.99 395.04 397.28 385.61 $\rho = 0$ AIC 39.99 395.04 397.25 385.45 $\rho = 0$ AIC 39.99 395.04 397.25 385.61 $\rho = 0$ AIC 39.144 14.44 14.45 14.67 14.45 $\rho = 0$ AIC 131.83 132.94 133.82 129.89 $\rho = 0$ AIC 131.84 14.44 14.44 14.45 14.67 14.45 $\rho = 0$ AIC 131.84 14.44 14.44							
AIC 24.45 24.64 24.82 24.13 P Coracle : 24.83 P Coracle : 24.84 P Coracle : 24.83 P Coracle : 24.84 P Coracle : 24.85 P Coracle : 24						51.80	
BIC 24.44 24.63 24.82 24.14 Oracle : 24.83 CV. Ise 20.83 20.84 20.86 10.87 20.84 20.96 20.56 30.83 30.83 30.83 30.83 30.84 30.84 30.84 30.84 30.84 30.94 30.84 30.94 30.84 30.94 30.94 30.94 30.94 30.94				24.78			$\rho = 0$
BIC 24.44 24.03 24.82 24.14 CV.Isin 20.83 20.84 20.86 10.87 20.84 CV.min 19.15 20.19 20.68 8.57 19.09 $sd(\mu)/\sigma = 2$ AIC 18.93 18.83 8.35 13.38 $\rho = 0.5$ AIC 8.26 8.30 8.37 8.18 Oracle: 8.37 CV.Ise 3.54 3.54 3.53 3.00 3.54 $sd(\mu)/\sigma = 2$ AIC 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 1.40 1.40 1.42 2.30 Oracle: 1.42 CV.1se 99.62 99.74 99.82 84.51 99.66 CV.min 94.55 98.98 99.72 96.27 ρ ρ Oracle: 8.46 CV.1se 93.64 33.67 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>Oracle : 24.83</td>							Oracle : 24.83
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	24.44	24.63	24.82	24.14		07466.24.03
AICc 18.93 18.83 8.35 13.38 $\rho = 0.5$ AIC 8.26 8.30 8.37 8.18 $\rho = 0.5$ AIC 8.26 8.30 8.37 8.18 $\rho = 0.5$ Oracle : 8.37 CV.1se 3.54 3.54 3.53 3.00 3.54 $\rho = 0.5$ AIC 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 99.74 99.82 84.51 99.66 $\rho = 0.9$ AIC 97.75 98.62 99.77 96.27 $\rho = 0.9$ AIC 97.75 98.62 99.27 96.27 $\rho = 0.2$ AIC 97.71 98.58 99.26 96.23 $\rho = 0.5$ AIC 33.04 33.36 33.36 33.36 $\rho = 0.5$ AIC 33.00 33.24 33.36 28.83 $\rho = 0.5$ AIC 33.00 33.22 33.49 32.55 $\rho = 0.5$ AIC 33.00 33.22 33.49 32.55 $\rho = 0.5$ AIC 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.88 5.61 5.68 5.42 $\rho = 0.9$ AIC 39.16 5.88 25.10 30.79 25.10 $\rho = 0.9$ AIC 39.16 39.51 39.52 $\rho = 0.9$ AIC 5.88 3.17 28.79 38.48 $\rho = 0.9$ AIC 39.16 39.93 39.50 30.79 25.10 $\rho = 0.9$ AIC 5.88 5.61 5.68 5.44 $\rho = 0.9$ AIC 5.84 5.70 5.62 5.05 $\rho = 0.9$ AIC 39.93 38.145 396.97 28.85 38.54 $\rho = 0.5$ AIC 39.99 395.04 397.25 385.45 $\rho = 0.9$ AIC 39.16 395.18 397.28 385.61 $\rho = 0.5$ AIC 39.16 395.18 397.28 385.61 $\rho = 0.5$ AIC 39.16 395.18 397.28 385.61 $\rho = 0.5$ AIC 31.70	CV.1se	20.83	20.84	20.86	10.87	20.84	
AIC 8.26 8.30 8.37 8.18 $Oracle: 8.37$ CV.1se 3.54 3.54 3.53 3.00 3.54 $(\mu)/\sigma = 2$ AIC 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 1.40 1.40 1.42 1.38 $\rho = 0.9$ AIC 1.40 1.40 1.42 2.30 $\rho = 0.9$ AIC 2.16 3.78 99.62 99.74 99.82 84.51 99.66 $\rho = 0.9$ AIC 93.78 93.69 99.07 83.67 $\rho = 0.9$ AIC 97.75 98.62 99.27 96.27 $\rho = 0.9$ AIC 97.75 98.62 99.27 96.23 $\rho = 0.9$ AIC 2.30 $\rho = 0.9$ AIC 3.36 3.36 33.69 30.80 32.52 $\rho = 0.9$ AIC 3.36 3.37 3.37 3.38 33.69 30.80 32.52 $\rho = 0.5$ AIC 3.30 33.24 33.36 28.83 $\rho = 0.5$ AIC 3.30 3.32 33.49 32.55 $\rho = 0.5$ AIC 3.30 3.32 33.49 32.53 $\rho = 0.5$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ AIC 3.91.16 395.18 397.28 385.61 $\rho = 0.5$ AIC 3.91.16 395.18 397.25 385.45 $\rho = 0.5$ AIC 3.91.16 395.18 397.28 385.61 $\rho = 0.5$ AIC 4.44 4.44 4.44 4.44 5.44 6.67 14.45 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 $\rho = 0.5$ AIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ AIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ AIC 14.39 14.47 22.61 151.40 $\rho = 0.5$ AIC 14.39 14.47 22.61 151.40	CV.min	19.15	20.19	20.68	8.57	19.09	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 8.25 8.30 8.37 8.21 Oracle : 8.37 CV. Ise 3.54 3.54 3.53 3.00 3.54 $sd(\mu)/\sigma = 2$ AIC 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 1.40 1.40 1.42 1.38 Oracle : 1.42 CV. Ise 99.62 99.74 99.82 84.51 99.66 CV.min 94.55 98.98 99.72 92.58 94.75 $sd(\mu)/\sigma = 1$ AIC 93.78 93.69 99.27 96.27 Oracle : 86.46 CV. Ise 93.64 33.67 33.71 28.79 33.68 CV. Ise 33.64 33.67 33.71 28.79 33.68 CV. Ise 33.64 33.67 33.71 28.79 33.68 CV. Ise 33.64 33.67 33.71 28.79 33.68 CV. Ise 33.02 33.24 33.349 32.53 Oracle : 29.19 CV. Ise 5.73 <td< td=""><td>AICc</td><td>18.93</td><td>18.83</td><td>8.35</td><td>13.38</td><td></td><td>$\rho = 0.5$</td></td<>	AICc	18.93	18.83	8.35	13.38		$\rho = 0.5$
BIC 8.25 8.30 8.31 8.21 CV.Isia 3.54 3.53 3.00 3.54 CV.min 3.20 3.27 3.41 2.17 3.21 sd(μ)/σ = 2 AICc 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 1.40 1.40 1.42 1.38 Oracle : 1.42 CV.Ise 99.62 99.74 99.82 84.51 99.66 CV.min 94.55 98.98 99.72 92.58 94.75 sd(μ)/σ = 1 AICc 93.78 93.69 99.07 83.67 $\rho = 0$ AIC 97.75 98.62 99.27 96.27 Oracle : 86.46 CV.Ise 33.64 33.67 33.71 28.79 33.68 sd(μ)/σ = 1 AICc 32.08 32.43 33.36 28.83 $\rho = 0.5$ CV.Ise 33.00 33.22 33.49 32.53 Oracle : 29.19 CV.Ise 5.73 5.73 5.73	AIC	8.26	8.30	8.37	8.18		Orgalo · § 37
$\begin{array}{c} \text{CV.min} & 3.20 & 3.27 & 3.41 & 2.17 & 3.21 & \mathrm{sd}(\mu)/\sigma = 2\\ \text{AICc} & 3.11 & 3.48 & 1.60 & 2.48 & \rho = 0.9\\ \text{AIC} & 1.40 & 1.40 & 1.42 & 1.38\\ \text{BIC} & 1.40 & 1.40 & 1.42 & 2.30 & Oracle: 1.42\\ \hline \text{CV.Ise} & 99.62 & 99.74 & 99.82 & 84.51 & 99.66\\ \text{CV.min} & 94.55 & 98.98 & 99.72 & 92.58 & 94.75 & \mathrm{sd}(\mu)/\sigma = 1\\ \text{AICc} & 93.78 & 93.69 & 99.07 & 83.67 & \rho = 0\\ \text{AIC} & 97.75 & 98.62 & 99.27 & 96.27\\ \hline \text{BIC} & 97.71 & 98.58 & 99.26 & 96.23 & Oracle: 86.46\\ \hline \text{CV.Ise} & 33.64 & 33.67 & 33.71 & 28.79 & 33.68\\ \hline \text{CV.min} & 32.47 & 33.31 & 33.69 & 30.80 & 32.52 & \mathrm{sd}(\mu)/\sigma = 1\\ \text{AICc} & 32.08 & 32.43 & 33.36 & 28.83 & \rho = 0.5\\ \hline \text{AIC} & 33.02 & 33.24 & 33.49 & 32.55 & Oracle: 29.19\\ \hline \text{CV.Ise} & 5.73 & 5.73 & 5.73 & 5.38 & 5.74\\ \hline \text{CV.min} & 5.53 & 5.59 & 5.70 & 4.97 & 5.53 & \mathrm{sd}(\mu)/\sigma = 1\\ \hline \text{AICc} & 5.44 & 5.70 & 5.62 & 5.05 & \rho = 0.9\\ \hline \text{AIC} & 5.58 & 5.61 & 5.68 & 5.42 & Oracle: 4.90\\ \hline \text{CV.Ise} & 250.85 & 250.88 & 251.03 & 307.99 & 251.08\\ \hline \text{CV.Ise} & 250.85 & 250.88 & 251.03 & 307.99 & 251.08\\ \hline \text{CV.Ise} & 390.99 & 395.04 & 397.25 & 385.45\\ \hline \text{CV.Ise} & 84.73 & 11.72 & 133.55 & 90.21 & \rho = 0.5\\ \hline \text{AIC} & 84.43 & 117.72 & 133.55 & 90.21 & \rho = 0.5\\ \hline \text{AIC} & 84.43 & 117.72 & 133.55 & 90.21 & \rho = 0.5\\ \hline \text{AIC} & 84.43 & 117.72 & 133.55 & 90.21 & \rho = 0.5\\ \hline \text{AIC} & 84.43 & 117.72 & 133.55 & 90.21 & \rho = 0.5\\ \hline \text{AIC} & 131.83 & 132.94 & 133.82 & 129.89\\ \hline \text{CV.Ise} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Ise} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Ise} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Ise} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ \hline \text{CV.Isin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45\\ $	BIC	8.25	8.30	8.37	8.21		Oracie . 8.37
AICc 3.11 3.48 1.60 2.48 $\rho = 0.9$ AIC 1.40 1.40 1.42 1.38 $\rho = 0.9$ AIC 1.40 1.40 1.42 2.30 $\rho = 0.9$ AIC 1.40 1.40 1.42 2.30 $\rho = 0.9$ AIC 1.40 1.40 1.42 2.30 $\rho = 0.9$ AIC 2.30 $\rho = 0.9$ AIC 2.30 $\rho = 0.9$ AIC 2.378 93.69 99.72 92.58 94.75 $\rho = 0.9$ AIC 2.378 93.69 99.07 83.67 $\rho = 0.9$ AIC 2.379 98.58 99.26 96.23 $\rho = 0.9$ AIC 2.33.1 33.1 33.69 30.80 32.52 $\rho = 0.5$ AIC 33.02 33.24 33.49 32.55 $\rho = 0.5$ AIC 33.02 33.24 33.49 32.53 $\rho = 0.5$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.44 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.44 $\rho = 0.9$ AIC 2.49.3 381.45 396.97 266.84 $\rho = 0.9$ AIC 390.99 395.04 397.25 385.45 $\rho = 0.5$ AIC 31.83 132.94 133.82 129.89 BIC 131.76 132.84 118.99 85.26 $\rho = 0.5$ AIC 31.83 132.94 133.82 129.89 BIC 131.76 132.84 133.81 129.82 $\rho = 0.5$ AIC 14.39 14.44 14.49 14.54 16.22 14.49 $\rho = 0.9$ AIC 14.39 14.47 22.61 151.4 $\rho = 0.9$ AIC 14.39 14.47 22.61 151.4 $\rho = 0.9$ AIC 14.39 14.47 22.61 151.4	CV.1se	3.54	3.54	3.53	3.00	3.54	
AIC 1.40 1.40 1.42 1.38 BIC 1.40 1.40 1.42 2.30 CV.1se 99.62 99.74 99.82 84.51 99.66 CV.min 94.55 98.98 99.72 92.58 94.75 $sd(\mu)/\sigma=1$ AICc 93.78 93.69 99.07 83.67 $\rho=0$ AIC 97.75 98.62 99.27 96.27 BIC 97.71 98.58 99.26 96.23 CV.lse 33.64 33.67 33.71 28.79 33.68 CV.min 32.47 33.31 33.69 30.80 32.52 $sd(\mu)/\sigma=1$ AICc 33.02 33.24 33.49 32.55 BIC 33.00 33.22 33.49 32.53 CV.lse 5.73 5.73 5.73 5.73 5.38 5.74 CV.min 5.53 5.59 5.70 4.97 5.53 $sd(\mu)/\sigma=1$ AICc 5.44 5.70 5.62 5.05 $\rho=0.9$ AIC 5.58 5.61 5.68 5.42 BIC 5.58 5.61 5.68 5.42 CV.lse 250.85 250.88 251.03 307.99 251.08 CV.lse 84.75 84.79 84.80 98.73 84.80 CV.lse 84.75 84.79 84.80 98.73 84.80 CV.lse 84.75 84.79 84.80 98.73 84.80 CV.lse 131.83 132.94 133.81 129.82 CV.lse 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma=0.5$ AICc 14.39 14.47 22.61 151.4	CV.min	3.20	3.27	3.41	2.17	3.21	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 1.40 1.40 1.42 2.30 $Oracte: 1.42$ CV.1se 99.62 99.74 99.82 84.51 99.66 CV.min 94.55 98.98 99.72 92.58 94.75 $\rho=0$ AIC 93.78 93.69 99.07 83.67 $\rho=0$ AIC 97.75 98.62 99.27 96.27 $\rho=0$ AIC 97.75 98.62 99.26 96.23 $Oracle: 86.46$ CV.1se 33.64 33.67 33.71 28.79 33.68 CV.min 32.47 33.31 33.69 30.80 32.52 $\rho=0.5$ AIC 33.02 33.24 33.36 28.83 $\rho=0.5$ AIC 33.00 33.22 33.49 32.55 $Oracle: 9.99$ $Oracle: 9.99$ AIC 5.58 5.61 5.68 5.42 $Oracle: 9.99$ AIC 5.58 5.61 5.68 5.44 $Oracle: 9.99$ AIC 5.58 5.61 5.68 5.44 $Oracle: 9.99$ AIC 250.85 250.88 251.03 307.99 251.08 $Oracle: 4.90$ AIC 391.16 395.18 397.28 385.45 $Oracle: 260.93$ AIC 31.76 392.83 385.41 $Oracle: 260.93$ AIC 31.76 393.94 397.25 385.45 $Oracle: 260.93$ AIC 31.76 132.88 133.81 129.82 $Oracle: 87.87$ $Oracle: 87.87$ $Oracle: 87.87$ $Oracle: 260.93$ AIC 131.83 132.94 133.82 129.89 $Oracle: 87.87$	AICc	3.11	3.48	1.60	2.48		$\rho = 0.9$
BIC 1.40 1.40 1.42 2.30 CV.1se 99.62 99.74 99.82 84.51 99.66 CV.min 94.55 98.98 99.72 92.58 94.75 sd(μ)/σ = 1 AIC 93.78 93.69 99.07 83.67 ρ = 0 AIC 97.75 98.62 99.27 96.27 BIC 97.71 98.58 99.26 96.23 CV.Ise 33.64 33.67 33.71 28.79 33.68 CV.min 32.47 33.31 33.69 30.80 32.52 sd(μ)/σ = 1 AIC 33.02 33.24 33.36 28.83 ρ = 0.5 AIC 33.00 33.22 33.49 32.53 Oracle : 29.19 CV.lse 5.73 5.73 5.73 5.38 5.74 CVmin 5.53 5.59 5.70 4.97 5.53 sd(μ)/σ = 0 AIC 5.44 5.70 5.62 5.05 ρ ρ	AIC	1.40	1.40	1.42	1.38		Omagle : 1.42
CV.min 94.55 98.98 99.72 92.58 94.75 $\operatorname{sd}(\mu)/\sigma = 1$ AICc 93.78 93.69 99.07 83.67 $\rho = 0$ AIC 97.75 98.62 99.27 96.27 $\rho = 0$ Oracle : 86.46 CV.1se 33.64 33.67 33.71 28.79 33.68 $\rho = 0.5$ AIC 33.02 33.24 33.36 28.83 $\rho = 0.5$ AIC 33.00 33.22 33.49 32.55 $\rho = 0.5$ AIC 5.53 5.59 5.70 4.97 5.53 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 $\rho = 0.5$ AIC 31.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ AIC 14.49 $\rho = 0.5$ AIC 15.16 13.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ AIC 14.49 $\rho = 0.5$ AIC 14.49 $\rho = 0.5$ AIC 14.44 14.44 14.45 14.67 14.45 $\rho = 0.5$ AIC 14.49 $\rho = 0.5$ AIC 14.44 14.44 14.45 14.67 14.45 $\rho = 0.5$ AIC 14.49 $\rho = 0.5$ AIC 14.40 $\rho = 0.5$	BIC	1.40	1.40	1.42	2.30		Oracie : 1.42
AICc 93.78 93.69 99.07 83.67 $\rho = 0$ AIC 97.75 98.62 99.27 96.27 BIC 97.71 98.58 99.26 96.23 CV.1se 33.64 33.67 33.71 28.79 33.68 CV.min 32.47 33.31 33.69 30.80 32.52 $sd(\mu)/\sigma = 1$ AICc 32.08 32.43 33.36 28.83 $\rho = 0.5$ AIC 33.02 33.24 33.49 32.55 BIC 33.00 33.22 33.49 32.53 CV.min 5.53 5.73 5.73 5.73 5.38 5.74 CV.min 5.53 5.59 5.70 4.97 5.53 $sd(\mu)/\sigma = 1$ AICc 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 BIC 5.58 5.61 5.68 5.42 CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 CV.nin 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.nin 14.44 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AIC 14.39 14.47 22.61 15.14 AIC 243.3 22.50 22.55 21.62	CV.1se	99.62	99.74	99.82	84.51	99.66	
AICc 93.78 93.69 99.07 83.67 $\rho = 0$ AIC 97.75 98.62 99.27 96.27 BIC 97.71 98.58 99.26 96.23 CV.1se 33.64 33.67 33.71 28.79 33.68 CV.min 32.47 33.31 33.69 30.80 32.52 $sd(\mu)/\sigma = 1$ AICc 32.08 32.43 33.36 28.83 $\rho = 0.5$ AIC 33.02 33.24 33.49 32.55 BIC 33.00 33.22 33.49 32.53 CV.min 5.53 5.73 5.73 5.73 5.38 5.74 CV.min 5.53 5.59 5.70 4.97 5.53 $sd(\mu)/\sigma = 1$ AICc 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 BIC 5.58 5.61 5.68 5.42 CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 CV.nin 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.nin 14.44 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AIC 14.39 14.47 22.61 15.14 AIC 243.3 22.50 22.55 21.62	CV.min	94.55	98.98	99.72	92.58	94.75	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 97.71 98.58 99.26 96.23 $CV.1se$ 33.64 33.67 33.71 28.79 33.68 $CV.min$ 32.47 33.31 33.69 30.80 32.52 $cV.min$ 32.47 33.31 33.69 30.80 32.52 $cV.min$ 32.48 32.43 33.36 28.83 $cV.min$ 32.08 32.43 33.49 32.55 $cV.min$ 33.00 33.22 33.49 32.53 $cV.min$ 5.53 5.73 5.73 5.38 5.74 $cV.min$ 5.53 5.59 5.70 4.97 5.53 $cV.min$ 5.53 5.59 5.70 4.97 5.53 $cV.min$ 5.58 5.61 5.68 5.42 $cV.min$ 5.58 5.61 5.68 5.42 $cV.min$ 5.58 5.61 5.68 5.44 $cV.min$ 5.59 5.61 5.68 5.44 $cV.min$ 6.51 5.58 5.61 5.68 5.44 $cV.min$ 6.51.80 250.88 251.03 307.99 251.08 $cV.min$ 251.92 252.45 253.02 365.30 253.21 $cV.min$ 251.92 252.45 253.02 365.30 253.21 $cV.min$ 251.92 395.18 397.28 385.61 $cV.min$ 85.25 85.31 85.31 118.99 85.26 $cV.min$ 87.27 84.80 98.73 84.80 $cV.min$ 85.25 85.31 85.31 118.99 85.26 $cV.min$ 85.25 85.31 85.31 118.99 85.26 $cV.min$ 87.27 84.80 98.73 84.80 $cV.min$ 87.28 84.79 84.80 98.73 84.80 $cV.min$ 85.25 85.31 85.31 118.99 85.26 $cV.min$ 86.28 84.43 117.72 133.55 90.21 $cV.min$ 85.25 85.31 85.31 118.99 85.26 $cV.min$ 86.28 84.43 117.74 133.85 129.89 $cV.min$ 87.44 14.44 14.45 14.45 14.67 14.45 $cV.min$ 14.44 14.44 14.45 14.45 14.67 14.45 $cV.min$ 14.44 14.44 14.45 14.54 16.22 14.49 $cV.min$ 14.44 14.44 14.45 14.67 14.67 14.45 $cV.min$ 14.44 14.44 14.45 14.54 16.22 14.49 $cV.min$ 14.44 14.44 14.45 14.67 14.67 14.45 $cV.min$ 14.44 14.44 14.45 14.67 14.67 14.49 $cV.min$ 14.44 14.44 14.45 14.67 14.67 14.49 $cV.min$ 14.44 14.44 14.45 14.67 14.67 14.49 $cV.m$	AICc	93.78	93.69	99.07	83.67		
BIC 97.71 98.58 99.26 96.23 CV.1se 33.64 33.67 33.71 28.79 33.68 CV.min 32.47 33.31 33.69 30.80 32.52 $sd(\mu)/\sigma = 1$ AIC 32.08 32.43 33.36 28.83 $\rho = 0.5$ AIC 33.00 33.22 33.49 32.55 Oracle : 29.19 CV.1se 5.73 5.73 5.73 5.38 5.74 CV.min 5.53 5.59 5.70 4.97 5.53 $sd(\mu)/\sigma = 1$ AIC 5.58 5.61 5.68 5.42 Oracle : 4.90 CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AIC 391.16 395.18 397.28 385.61 Oracle : 260.93 CV.se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25	AIC	97.75	98.62	99.27	96.27		0 1 06 46
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	97.71	98.58	99.26	96.23		<i>Oracle</i> : 86.46
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	33.64	33.67	33.71	28.79	33.68	
AICc 32.08 32.43 33.36 28.83 $ρ = 0.5$ AIC 33.02 33.24 33.49 32.55 $Oracle : 29.19$ $Orac$				33.69		32.52	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 33.00 33.22 33.49 32.53 $Oracle : 29.19$ CV.1se 5.73 5.73 5.73 5.38 5.74 $Ovalling (V) = 0.9$ AIC 5.44 5.70 5.62 5.05 $ovalling (V) = 0.9$ AIC 5.58 5.61 5.68 5.42 $ovalling (V) = 0.9$ BIC 5.58 5.61 5.68 5.44 $ovalling (V) = 0.9$ CV.1se 250.85 250.88 251.03 307.99 251.08 $ovalling (V) = 0.9$ AIC 249.33 381.45 396.97 266.84 $ovalling (V) = 0.9$ AIC 391.16 395.18 397.28 385.61 $ovalling (V) = 0.9$ BIC 390.99 395.04 397.25 385.45 $ovalling (V) = 0.9$ CV.1se 84.75 84.79 84.80 98.73 84.80 $ovalling (V) = 0.9$ AIC 131.83 132.94 133.82 129.89 $ovalling (V) = 0.9$ BIC 131.76 132.88 133.81 129.82 $ovalling (V) = 0.9$ AIC 14.44 14.44 14.45 14.67 14.45 $ovalling (V) = 0.9$ AIC 14.39 14.47 22.61 15.14 $ovalling (V) = 0.9$ AIC 14.39 14.47 22.61 15.14 $ovalling (V) = 0.9$ AIC 23.33 23.55 23.50 23.75 21.62	AICc	32.08	32.43	33.36	28.83		
BIC 33.00 33.22 33.49 32.53 CV.1se 5.73 5.73 5.38 5.74 CV.min 5.53 5.59 5.70 4.97 5.53 $sd(\mu)/\sigma = 1$ AIC 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 Oracle : 4.90 CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AIC 391.16 395.18 397.28 385.61 Oracle : 260.93 BIC 390.99 395.04 397.25 385.45 Oracle : 260.93 CV.1se 84.75 84.79 84.80 98.73 84.80 $sd(\mu)/\sigma = 0.5$ AIC 131.83 132.94 133.82 129.89 $oracle : 87.87$ BIC 131.76 132.88 133.81 129.82 $oracle : 87.87$ CV.1se 14.44 </td <td>AIC</td> <td>33.02</td> <td>33.24</td> <td>33.49</td> <td>32.55</td> <td></td> <td>20.10</td>	AIC	33.02	33.24	33.49	32.55		20.10
$\begin{array}{ c c c c c c c c }\hline CV.1se & 5.73 & 5.73 & 5.73 & 5.38 & 5.74 \\ CV.min & 5.53 & 5.59 & 5.70 & \textbf{4.97} & 5.53 & \operatorname{sd}(\mu)/\sigma = 1 \\ AICc & 5.44 & 5.70 & 5.62 & 5.05 & \rho = 0.9 \\ AIC & 5.58 & 5.61 & 5.68 & 5.42 & Oracle : 4.90 \\ \hline BIC & 5.58 & 5.61 & 5.68 & 5.42 & Oracle : 4.90 \\ \hline CV.1se & 250.85 & 250.88 & 251.03 & 307.99 & 251.08 & \\ CV.min & 251.92 & 252.45 & 253.02 & 365.30 & 253.21 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ AICc & \textbf{249.33} & 381.45 & 396.97 & 266.84 & \rho = 0 \\ AIC & 391.16 & 395.18 & 397.28 & 385.61 & Oracle : 260.93 \\ \hline CV.1se & 84.75 & 84.79 & 84.80 & 98.73 & 84.80 & \\ CV.min & 85.25 & 85.31 & 85.31 & 118.99 & 85.26 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ AICc & \textbf{84.43} & 117.72 & 133.55 & 90.21 & \rho = 0.5 \\ AIC & 131.83 & 132.94 & 133.82 & 129.89 & Oracle : 87.87 \\ \hline CV.1se & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 & \\ CV.min & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 & \\ CV.min & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 & \\ CV.min & 14.44 & 14.49 & 14.54 & 16.22 & 14.49 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ AICc & \textbf{14.39} & 14.47 & 22.61 & 15.14 & \rho = 0.9 \\ AIC & 22.32 & 22.50 & 22.75 & 21.62 & \\ \hline \end{array}$	BIC	33.00	33.22	33.49	32.53		<i>Oracie</i> : 29.19
AICc 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ BIC 5.58 5.61 5.68 5.44 $\rho = 0.9$ CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $\rho = 0.5$ AICc 249.33 381.45 396.97 266.84 $\rho = 0.5$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 $\rho = 0.5$ CV.1se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25 85.31 85.31 118.99 85.26 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ CV.1se 14.44 14.44 14.45 14.67 14.45 $\rho = 0.5$ AIC 14.39 14.47 22.61 15.14 $\rho = 0.5$ AIC 14.39 14.47 22.61 15.14 $\rho = 0.5$ AIC 23.33 14.47 22.61 15.14 $\rho = 0.5$ AIC 23.33 22.50 23.75 21.63	CV.1se	5.73	5.73	5.73		5.74	
AICc 5.44 5.70 5.62 5.05 $\rho = 0.9$ AIC 5.58 5.61 5.68 5.42 $\rho = 0.9$ BIC 5.58 5.61 5.68 5.44 $\rho = 0.9$ CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $\rho = 0.5$ AICc 249.33 381.45 396.97 266.84 $\rho = 0.5$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 $\rho = 0.5$ CV.1se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25 85.31 85.31 118.99 85.26 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ CV.1se 14.44 14.44 14.45 14.67 14.45 $\rho = 0.5$ AIC 14.39 14.47 22.61 15.14 $\rho = 0.5$ AIC 14.39 14.47 22.61 15.14 $\rho = 0.5$ AIC 23.33 14.47 22.61 15.14 $\rho = 0.5$ AIC 23.33 22.50 23.75 21.63	CV.min	5.53	5.59	5.70	4.97	5.53	$\operatorname{sd}(\mu)/\sigma = 1$
AIC 5.58 5.61 5.68 5.42 $Oracle: 4.90$ BIC 5.58 5.61 5.68 5.44 $Oracle: 4.90$ CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 $Oracle: 260.93$ CV.min 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AIC 84.43 117.72 133.55 90.21 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 $Oracle: 87.87$ CV.1se 14.44 14.44 14.45 14.67 14.45 $Oracle: 87.87$ CV.min 14.44 14.49 14.54 16.22 14.49 $oracle: 81.90$ AIC 22.32 22.50 22.75 21.62							
BIC 5.58 5.61 5.68 5.44 Oracle: 4.90 CV.1se 250.85 250.88 251.03 307.99 251.08 CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AICc 249.33 381.45 396.97 266.84 $\rho = 0$ AIC 391.16 395.18 397.28 385.61 Oracle: 260.93 BIC 390.99 395.04 397.25 385.45 Oracle: 260.93 CV.1se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AIC 131.83 132.94 133.82 129.89 Oracle: 87.87 BIC 131.76 132.88 133.81 129.82 Oracle: 87.87 CV.nin 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ <	AIC	5.58	5.61	5.68	5.42		,
$\begin{array}{ c c c c c c c c }\hline \text{CV.1se} & 250.85 & 250.88 & 251.03 & 307.99 & 251.08 \\ \hline \text{CV.min} & 251.92 & 252.45 & 253.02 & 365.30 & 253.21 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AICc} & \textbf{249.33} & 381.45 & 396.97 & 266.84 & & & & & & & \\ \hline \text{AIC} & 391.16 & 395.18 & 397.28 & 385.61 & & & & & \\ \hline \text{BIC} & 390.99 & 395.04 & 397.25 & 385.45 & & & & & \\ \hline \text{CV.1se} & 84.75 & 84.79 & 84.80 & 98.73 & 84.80 & \\ \hline \text{CV.min} & 85.25 & 85.31 & 85.31 & 118.99 & 85.26 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AICc} & \textbf{84.43} & 117.72 & 133.55 & 90.21 & & & & \\ \hline \text{AIC} & 131.83 & 132.94 & 133.82 & 129.89 & & & & \\ \hline \text{BIC} & 131.76 & 132.88 & 133.81 & 129.82 & & & & \\ \hline \text{CV.nin} & 14.44 & 14.44 & 14.45 & 14.67 & 14.45 & \\ \hline \text{CV.min} & 14.44 & 14.49 & 14.54 & 16.22 & 14.49 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AICc} & \textbf{14.39} & 14.47 & 22.61 & 15.14 & & & \\ \hline \text{AIC} & 22.32 & 22.50 & 22.75 & 21.62 & & & \\ \hline \end{array}$							<i>Oracle</i> : 4.90
CV.min 251.92 252.45 253.02 365.30 253.21 $sd(\mu)/\sigma = 0.5$ AICc 249.33 381.45 396.97 266.84 $\rho = 0$ AIC 391.16 395.18 397.28 385.61 $\rho = 0$ BIC 390.99 395.04 397.25 385.45 $\rho = 0.5$ CV.1se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AIC 84.43 117.72 133.55 90.21 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 $\rho = 0.5$ BIC 131.76 132.88 133.81 129.82 $\rho = 0.5$ CV.1se 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AIC 14.39 14.47 22.61 15.14 $\rho = 0.9$						251.08	
AICc 249.33 381.45 396.97 266.84 $\rho = 0$ AIC 391.16 395.18 397.28 385.61 BIC 390.99 395.04 397.25 385.45 CV.1se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25 85.31 85.31 118.99 85.26 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 84.43 117.72 133.55 90.21 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.1se 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$							$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 391.16 395.18 397.28 385.61 $Oracle: 260.93$ $Oracl$	AICc	249.33	381.45	396.97	266.84		
BIC 390.99 395.04 397.25 385.45 CV.1se 84.75 84.79 84.80 98.73 84.80 CV.min 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AICc 84.43 117.72 133.55 90.21 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.1se 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$	AIC	391.16	395.18	397.28	385.61		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	BIC	390.99	395.04	397.25	385.45		Oracle: 260.93
CV.min 85.25 85.31 85.31 118.99 85.26 $sd(\mu)/\sigma = 0.5$ AICc 84.43 117.72 133.55 90.21 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.1se 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$	CV.1se	84.75		84.80		84.80	
AICc 84.43 117.72 133.55 90.21 $\rho = 0.5$ AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.1se 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$		85.25	85.31	85.31	118.99	85.26	$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 131.83 132.94 133.82 129.89 BIC 131.76 132.88 133.81 129.82 CV.1se 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$							
BIC 131.76 132.88 133.81 129.82 Oracle: 87.87 CV.1se 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$ AIC 22.32 22.50 22.75 21.62							,
CV.1se 14.44 14.44 14.45 14.67 14.45 CV.min 14.44 14.49 14.54 16.22 14.49 $sd(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$ AIC 22.32 22.50 22.75 21.62							<i>Oracle</i> : 87.87
CV.min 14.44 14.49 14.54 16.22 14.49 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$						14.45	
AICc 14.39 14.47 22.61 15.14 $\rho = 0.9$							$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 22.32 22.50 22.75 21.62							\' //
1110 22,32 22,30 22,13 21,02	AIC	22.32	22.50	22.75	21.62		,
BIC 22.31 22.50 22.74 18.94 Oracle: 14.79							<i>Oracle</i> : 14.79

Table 50: Estimation MSE for n=100, continuous design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	123.78	124.17	124.38	55.67	123.87	
CV.min	105.81	121.52	122.75	48.79	106.45	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	109.36	52.25	49.94	74.35		$\rho = 0$
AIC	49.18	49.63	49.96	48.59		Oracle : 50.89
BIC	49.16	49.61	49.96	48.58		Oracie : 50.89
CV.1se	41.62	41.63	41.66	21.97	41.60	
CV.min	38.52	40.66	41.36	17.13	38.32	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	37.84	29.69	16.67	26.77		$\rho = 0.5$
AIC	16.46	16.57	16.70	16.31		Omasla , 17 02
BIC	16.45	16.57	16.69	16.3		<i>Oracle</i> : 17.03
CV.1se	6.86	6.85	6.85	5.93	6.86	
CV.min	6.37	6.53	6.75	4.25	6.36	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.19	6.79	2.75	4.94		$\rho = 0.9$
AIC	2.70	2.71	2.74	2.67		012.90
BIC	2.69	2.71	2.74	4.17		Oracle: 2.80
CV.1se	200.18	200.56	200.62	170.55	200.38	
CV.min	190.91	199.28	200.41	186.30	190.80	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	189.24	191.81	199.68	168.56		$\rho = 0$
AIC	196.78	198.74	199.88	193.84		·
BIC	196.71	198.66	199.87	193.77		Oracle: 186.60
CV.1se	67.24	67.30	67.34	57.55	67.30	
CV.min	64.84	66.87	67.31	61.27	64.94	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	64.19	63.51	66.78	57.55		$\rho = 0.5$
AIC	65.93	66.46	66.92	65.00		
BIC	65.88	66.43	66.91	64.97		Oracle: 62.50
CV.1se	11.08	11.07	11.08	10.48	11.08	
CV.min	10.75	10.89	11.04	9.69	10.77	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.58	11.04	10.92	9.86		$\rho = 0.9$
AIC	10.79	10.87	10.99	10.50		
BIC	10.79	10.87	10.99	10.60		Oracle: 10.21
CV.1se	505.57	505.68	505.88	621.63	505.30	
CV.min	507.03	508.25	509.82	736.30	509.71	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	502.04	779.80	797.64	536.72		$\rho = 0$
AIC	787.28	796.26	799.84	776.11		,
BIC	786.99	795.99	799.78	775.79		Oracle: 527.53
CV.1se	169.34	169.55	169.49	197.63	169.47	
CV.min	170.16	170.31	170.41	237.39	170.31	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	168.77	252.44	267.51	180.60		$\rho = 0.5$
AIC	263.70	266.29	267.81	259.78		
BIC	263.52	266.19	267.78	259.63		Oracle: 176.63
CV.1se	27.83	27.83	27.85	28.27	27.84	
CV.min	27.80	27.97	28.03	31.23	27.92	$sd(\mu)/\sigma = 0.5$
AICc	27.75	28.33	43.63	29.27		$\rho = 0.9$
AIC	43.01	43.43	43.86	41.67		·
BIC	42.99	43.41	43.84	36.55		<i>Oracle</i> : 28.81
						L

Table 51: Estimation MSE for n=100, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	0.64	0.57	0.63	0.4	0.47	
CV.min	0.42	0.4	0.46	0.41	0.4	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.48	0.43	0.46	0.4		$\rho = 0$
AIC	0.47	0.47	0.48	0.44		Oracle: 0.27
BIC	0.47	0.47	0.48	0.44		07 dete : 0.27
CV.1se	0.65	0.57	0.63	0.38	0.46	
CV.min	0.40	0.38	0.45	0.38	0.37	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47	0.41	0.41	0.39		$\rho = 0.5$
AIC	0.42	0.42	0.43	0.40		Oracle: 0.24
BIC	0.42	0.42	0.43	0.40		07 dete : 0.21
CV.1se	0.64	0.56	0.63	0.36	0.45	
CV.min	0.39	0.38	0.45	0.36	0.36	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.46	0.40	0.38	0.38		$\rho = 0.9$
AIC	0.40	0.40	0.41	0.38		Oracle: 0.23
BIC	0.40	0.40	0.41	0.38		07466 . 0.25
CV.1se	1.86	1.86	1.89	1.52	1.84	
CV.min	1.58	1.65	1.78	1.74	1.60	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.58	1.60	1.91	1.45		$\rho = 0$
AIC	1.91	1.92	1.94	1.86		Oracle : 1.09
BIC	1.91	1.92	1.94	1.85		07 acte : 1.07
CV.1se	1.69	1.68	1.70	1.39	1.67	
CV.min	1.46	1.50	1.62	1.57	1.47	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.45	1.46	1.70	1.32		$\rho = 0.5$
AIC	1.71	1.72	1.74	1.66		Oracle: 0.97
BIC	1.71	1.72	1.73	1.66		07 dete : 0.57
CV.1se	1.60	1.60	1.62	1.31	1.58	
CV.min	1.39	1.43	1.54	1.48	1.40	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.39	1.40	1.61	1.26		$\rho = 0.9$
AIC	1.62	1.63	1.64	1.58		Oracle: 0.92
BIC	1.62	1.63	1.64	1.57		07466 . 0.72
CV.1se	4.92	4.92	4.93	5.99	4.92	
CV.min	4.92	4.94	4.97	7.11	4.96	$sd(\mu)/\sigma = 0.5$
AICc	4.87	5.98	7.74	5.20		$\rho = 0$
AIC	7.69	7.74	7.80	7.57		Oracle : 4.35
BIC	7.69	7.73	7.80	7.57		07466 . 4.33
CV.1se	4.40	4.40	4.41	5.38	4.40	
CV.min	4.41	4.42	4.43	6.39	4.44	$sd(\mu)/\sigma = 0.5$
AICc	4.36	5.23	6.91	4.66		$\rho = 0.5$
AIC	6.87	6.91	6.97	6.77		Oracle : 3.90
BIC	6.87	6.91	6.97	6.76		07466 . 3.70
CV.1se	4.18	4.18	4.18	5.02	4.18	
CV.min	4.18	4.19	4.21	6.00	4.20	$sd(\mu)/\sigma = 0.5$
AICc	4.13	4.86	6.53	4.42		$\rho = 0.9$
AIC	6.50	6.54	6.59	6.40		Oracle : 3.69
BIC	6.50	6.53	6.59	6.39		57 act . 5.09

Table 52: Estimation MSE for n=100, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	1.47	1.35	1.90	0.84	1.13	
CV.min	0.91	0.88	1.34	0.86	0.87	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.06	0.83	0.97	0.86		$\rho = 0$
AIC	0.98	0.98	1.00	0.93		Oracle: 0.56
BIC	0.98	0.98	1.00	0.92		07466.0.50
CV.1se	1.54	1.43	1.82	0.79	1.17	
CV.min	0.89	0.89	1.39	0.79	0.85	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.07	0.79	0.86	0.83		$\rho = 0.5$
AIC	0.88	0.88	0.89	0.84		Oracle: 0.50
BIC	0.88	0.88	0.89	0.84		01466.0.50
CV.1se	1.50	1.40	1.78	0.76	1.18	
CV.min	0.87	0.90	1.37	0.76	0.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.05	0.79	0.81	0.82		$\rho = 0.9$
AIC	0.83	0.83	0.84	0.79		Oracle: 0.48
BIC	0.83	0.83	0.84	0.79		07 acte . 0.46
CV.1se	3.93	3.96	4.00	3.22	3.93	
CV.min	3.41	3.65	3.89	3.67	3.44	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.43	3.42	3.99	3.09		$\rho = 0$
AIC	3.97	3.99	4.03	3.87		Oracle: 2.25
BIC	3.96	3.99	4.03	3.86		Oracie : 2.23
CV.1se	3.54	3.54	3.58	2.93	3.54	
CV.min	3.14	3.32	3.49	3.29	3.17	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.13	3.09	3.55	2.82		$\rho = 0.5$
AIC	3.54	3.56	3.59	3.46		Oracle: 2.01
BIC	3.54	3.55	3.59	3.45		Oracle : 2.01
CV.1se	3.34	3.36	3.38	2.77	3.33	
CV.min	2.98	3.15	3.30	3.08	3.00	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.98	2.94	3.35	2.68		$\rho = 0.9$
AIC	3.34	3.35	3.39	3.26		Oracle: 1.90
BIC	3.33	3.35	3.39	3.26		Oracie : 1.90
CV.1se	10.17	10.17	10.19	12.43	10.17	
CV.min	10.17	10.22	10.26	14.81	10.28	$sd(\mu)/\sigma = 0.5$
AICc	10.09	14.04	16.09	10.77		$\rho = 0$
AIC	15.93	16.04	16.16	15.68		Oracle: 9.00
BIC	15.92	16.03	16.16	15.66		07 acte . 9.00
CV.1se	9.09	9.10	9.11	11.13	9.10	
CV.min	9.13	9.13	9.16	13.22	9.18	$sd(\mu)/\sigma = 0.5$
AICc	9.02	12.34	14.33	9.64		$\rho = 0.5$
AIC	14.20	14.29	14.40	13.98		Oracle : 8.05
BIC	14.19	14.29	14.40	13.97		07 acte . 8.03
CV.1se	8.59	8.60	8.60	10.43	8.59	
CV.min	8.62	8.64	8.65	12.40	8.66	$sd(\mu)/\sigma = 0.5$
AICc	8.52	11.58	13.53	9.14		$\rho = 0.9$
AIC	13.40	13.49	13.60	13.19		<i>Oracle</i> : 7.61
BIC	13.39	13.48	13.59	13.18		07 acie: 7.01

Table 53: Estimation MSE for n=100, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	1.64	1.52	2.13	0.93	1.27	
CV.min	1.01	0.98	1.54	0.96	0.97	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.18	0.92	1.08	0.96		$\rho = 0$
AIC	1.09	1.09	1.11	1.03		Oracle: 0.62
BIC	1.09	1.09	1.11	1.02		07466.0.02
CV.1se	1.73	1.61	2.07	0.88	1.31	
CV.min	1.00	1.00	1.58	0.88	0.95	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.19	0.86	0.96	0.92		$\rho = 0.5$
AIC	0.97	0.97	0.99	0.93		Oracle: 0.56
BIC	0.97	0.97	0.99	0.93		01466.0.30
CV.1se	1.68	1.57	2.00	0.85	1.33	
CV.min	0.97	1.02	1.56	0.84	0.93	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.17	0.86	0.91	0.90		$\rho = 0.9$
AIC	0.92	0.92	0.93	0.88		Oracle: 0.53
BIC	0.92	0.92	0.93	0.88		01 acte . 0.55
CV.1se	4.37	4.39	4.44	3.57	4.36	
CV.min	3.79	4.08	4.32	4.07	3.83	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.81	3.81	4.44	3.44		$\rho = 0$
AIC	4.41	4.43	4.48	4.30		Oracle: 2.50
BIC	4.40	4.43	4.48	4.29		Oracie : 2.30
CV.1se	3.93	3.94	3.97	3.25	3.93	
CV.min	3.50	3.70	3.89	3.66	3.54	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.48	3.43	3.95	3.13		$\rho = 0.5$
AIC	3.93	3.95	3.99	3.84		Oracle: 2.23
BIC	3.93	3.95	3.99	3.84		07 acte . 2.23
CV.1se	3.72	3.74	3.76	3.08	3.71	
CV.min	3.31	3.52	3.68	3.43	3.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.32	3.26	3.73	2.98		$\rho = 0.9$
AIC	3.71	3.73	3.77	3.63		Oracle: 2.11
BIC	3.71	3.73	3.77	3.63		Oracle: 2.11
CV.1se	11.29	11.30	11.32	13.82	11.30	
CV.min	11.31	11.36	11.41	16.47	11.43	$sd(\mu)/\sigma = 0.5$
AICc	11.21	15.81	17.90	11.99		$\rho = 0$
AIC	17.71	17.84	17.97	17.43		Oracle: 9.99
BIC	17.70	17.83	17.97	17.42		01466. 9.99
CV.1se	10.09	10.09	10.10	12.37	10.09	
CV.min	10.15	10.14	10.17	14.68	10.19	$sd(\mu)/\sigma = 0.5$
AICc	10	13.91	15.92	10.71		$\rho = 0.5$
AIC	15.76	15.87	15.99	15.52		<i>Oracle</i> : 8.94
BIC	15.76	15.86	15.99	15.51		01 ude : 0.94
CV.1se	9.54	9.55	9.56	11.59	9.54	
CV.min	9.59	9.59	9.61	13.78	9.62	$sd(\mu)/\sigma = 0.5$
AICc	9.46	13.05	15.04	10.15		$\rho = 0.9$
AIC	14.89	14.99	15.10	14.65		Oracle : 8.45
BIC	14.88	14.98	15.10	14.65		Oracie : 8.43
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Table 54: Estimation MSE for n=100, binary design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$		_		
CV.1se	1.73	1.60	2.24	0.98	1.33	
CV.min	1.07	1.04	1.63	1.01	1.03	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.24	0.96	1.14	1.01		$\rho = 0$
AIC	1.15	1.15	1.17	1.09		Oracle : 0.66
BIC	1.15	1.15	1.17	1.08		07 acic : 0.00
CV.1se	1.83	1.71	2.19	0.92	1.39	
CV.min	1.05	1.06	1.68	0.93	1.00	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.25	0.9	1.02	0.97		$\rho = 0.5$
AIC	1.03	1.03	1.04	0.98		Oracle : 0.59
BIC	1.03	1.03	1.04	0.98		Oracie : 0.39
CV.1se	1.77	1.66	2.11	0.89	1.41	
CV.min	1.02	1.08	1.65	0.89	0.99	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.24	0.90	0.96	0.95		$\rho = 0.9$
AIC	0.97	0.97	0.99	0.93		Oracle : 0.56
BIC	0.97	0.97	0.99	0.93		Oracie: 0.30
CV.1se	4.60	4.63	4.68	3.77	4.60	
CV.min	4.00	4.31	4.56	4.29	4.04	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.02	4.02	4.68	3.62		$\rho = 0$
AIC	4.64	4.67	4.72	4.53		
BIC	4.64	4.67	4.72	4.52		<i>Oracle</i> : 2.63
CV.1se	4.15	4.16	4.20	3.44	4.15	
CV.min	3.69	3.92	4.11	3.86	3.73	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.68	3.62	4.18	3.31		$\rho = 0.5$
AIC	4.15	4.18	4.22	4.06		
BIC	4.15	4.17	4.22	4.06		<i>Oracle</i> : 2.36
CV.1se	3.92	3.95	3.97	3.25	3.91	
CV.min	3.50	3.71	3.88	3.62	3.53	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	3.51	3.44	3.94	3.14		$\rho = 0.9$
AIC	3.91	3.94	3.97	3.83		
BIC	3.91	3.93	3.97	3.82		Oracle: 2.23
CV.1se	11.92	11.93	11.95	14.58	11.93	
CV.min	11.93	11.99	12.04	17.34	12.05	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	11.84	16.71	18.88	12.64		$\rho = 0$
AIC	18.67	18.80	18.95	18.38		
BIC	18.66	18.80	18.95	18.37		Oracle: 10.54
CV.1se	10.65	10.66	10.67	13.06	10.65	
CV.min	10.72	10.71	10.73	15.50	10.77	$sd(\mu)/\sigma = 0.5$
AICc	10.57	14.75	16.82	11.29		$\rho = 0.5$
AIC	16.65	16.76	16.89	16.39		
BIC	16.64	16.75	16.89	16.38		Oracle: 9.44
CV.1se	10.06	10.07	10.07	12.21	10.06	
CV.nsc	10.12	10.13	10.12	14.51	10.13	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	9.97	13.86	15.85	10.70	10.10	$\rho = 0.9$
AIC	15.69	15.79	15.92	15.44		
BIC	15.68	15.79	15.91	15.43		Oracle: 8.92
	15.00	13.13	13.71	15.75		

Table 55: Estimation MSE for n=100, continuous design, sparse covariates, and decay 10.

$ \begin{array}{c} \text{CV.lse} & 2.65 & 2.33 & 2.63 & 1.63 & 1.93 \\ \text{CV.min} & 1.71 & 1.64 & 1.90 & 1.64 & 1.61 & \text{sd}(\mu)/\sigma = 2 \\ \text{AICc} & 1.96 & 1.96 & 1.87 & 1.63 & \\ \text{AIC} & 1.89 & 1.89 & 1.92 & 1.77 & \\ \text{BIC} & 1.89 & 1.89 & 1.92 & 1.77 & \\ \text{CV.lse} & 1.76 & 1.68 & 1.59 & 0.92 & 1.46 \\ \text{CV.min} & 1.27 & 1.26 & 1.37 & 0.75 & 1.13 & \text{sd}(\mu)/\sigma = 2 \\ \text{AICc} & 1.32 & 1.51 & 0.95 & 1.00 & \rho = 0.5 \\ \text{AIC} & 0.75 & 0.75 & 0.76 & 0.85 & Oracle : 0.43 \\ \text{CV.lse} & 0.38 & 0.36 & 0.32 & 0.26 & 0.33 & \\ \text{CV.lse} & 0.38 & 0.36 & 0.32 & 0.26 & 0.33 & \\ \text{CV.lmin} & 0.29 & 0.29 & 0.29 & 0.20 & 0.28 & \text{sd}(\mu)/\sigma = 2 \\ \text{AICc} & 0.29 & 0.33 & 0.32 & 0.22 & \rho = 0.9 \\ \text{AIC} & 0.19 & 0.19 & 0.20 & 0.18 & Oracle : 0.11 \\ \text{CV.lse} & 7.53 & 7.48 & 7.59 & 6.10 & 7.45 & \\ \text{CV.lmin} & 6.40 & 6.61 & 7.19 & 6.97 & 6.46 & \text{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 6.35 & 7.08 & 7.66 & 5.83 & \rho = 0 \\ \text{AIC} & 7.68 & 7.71 & 7.80 & 7.45 & Oracle : 4.37 \\ \text{CV.lse} & 3.04 & 3.03 & 3.00 & 2.54 & 3.00 & Oracle : 4.37 \\ \text{CV.lse} & 3.04 & 3.03 & 3.00 & 2.54 & 3.00 & Oracle : 4.37 \\ \text{CV.lse} & 3.04 & 3.03 & 3.00 & 2.54 & 3.00 & Oracle : 1.71 \\ \text{CV.lse} & 3.04 & 3.03 & 3.00 & 2.54 & 3.00 & Oracle : 1.71 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.71 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.min} & 0.65 & 0.64 & 0.63 & 0.62 & 0.63 & \text{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 0.78 & 0.78 & 0.80 & 0.64 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & Oracle : 0.45 \\ \text{CV.lse} & 0.76 & 0.77 & 0.81 & 0.85 & 0.79 & \text{sd}(\mu)/\sigma = 0.5 \\ \text{AIC} & 0.78 & 0.78 & 0.80 & 0.64 & 0.63 & \text{sd}(\mu)/\sigma = 0.5 \\ \text{AIC} & 0.84 & 0.98 & 0.98 & 0.80 & 0.64 & Oracle : 0$		lasso	$\operatorname{GL} \gamma = 1$		marginal AL		
AICc 1.96 1.96 1.87 1.63 $\rho = 0$ AIC 1.89 1.89 1.92 1.77 $\rho = 0$ BIC 1.89 1.89 1.92 1.77 $\rho = 0$ CV.Ise 1.76 1.68 1.59 0.92 1.46 $\rho = 0$ CV.Imin 1.27 1.26 1.37 0.75 1.13 $\rho = 0$ AIC 0.75 0.75 0.75 0.76 0.85 $\rho = 0.5$ AIC 0.75 0.75 0.76 0.85 $\rho = 0.5$ CV.Ise 0.38 0.36 0.32 0.26 0.33 $\rho = 0.5$ AIC 0.19 0.19 0.19 0.20 0.18 $\rho = 0.5$ AIC 0.20 0.20 0.20 0.20 0.30 $\rho = 0.5$ CV.Ise 7.53 7.48 7.59 6.10 7.45 $\rho = 0.5$ AIC 6.35 7.08 7.66 5.83 $\rho = 0.5$ AIC 0.37 7.71 7.80 7.45 $\rho = 0.5$ AIC 0.37 7.71 7.80 7.42 $\rho = 0.5$ AIC 0.30 3.03 3.00 2.54 3.00 $\rho = 0.5$ AIC 0.57 7.71 7.80 7.42 $\rho = 0.5$ AIC 0.76 7.71 7.80 7.42 $\rho = 0.5$ AIC 0.77 7.71 7.80 7.42 $\rho = 0.5$ AIC 0.78 0.74 0.68 0.65 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.80 0.61 $\rho = 0.5$ AIC 0.79 0.74 0.68 0.65 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.61 $\rho = 0.5$ AIC 0.78 0.78 0.80 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 BIC 0.78 0.78 0.80 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 BIC 0.78 0.78 0.80 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 BIC 0.78 0.78 0.80 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.78 0.80 0.71 BIC 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.71 BIC 0.78 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.78 0.78 0.78 0.80 0.71 $\rho = 0.5$ AIC 0.79 0.79 0.70 0.70 0.70 0.70 0.70 0.70							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						1.61	
BIC 1.89 1.89 1.92 1.77 Oracle: 1.09 CV.Ise 1.76 1.68 1.59 0.92 1.46 CV-min 1.27 1.26 1.37 0.75 1.13 $sd(\mu)/\sigma = 2$ AIC 0.75 0.75 0.76 0.73 Oracle: 0.43 CV.Ise 0.38 0.36 0.32 0.26 0.33 CV.min 0.29 0.29 0.20 0.28 $sd(\mu)/\sigma = 2$ AIC 0.19 0.19 0.20 0.28 $sd(\mu)/\sigma = 2$ AIC 0.29 0.33 0.32 0.22 $\rho = 0.9$ AIC 0.19 0.19 0.20 0.18 Oracle: 0.11 CV.lse 7.53 7.48 7.59 6.10 7.45 $cd(\mu)/\sigma = 1$ AIC 6.35 7.08 7.66 5.83 $\rho = 0$ AIC 6.65 7.71 7.80 7.42 Oracle: 4.37 CV.lse 3.04 3.03 3.00 2.54							$\rho = 0$
Section Se							$Oracle \cdot 1.09$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$							074666 . 1.05
AICc 1.32 1.51 0.95 1.00 $\rho = 0.5$ AIC 0.75 0.75 0.76 0.73 $\rho = 0.5$ AIC 0.75 0.75 0.76 0.78 $\rho = 0.5$ Oracle : 0.43 $\rho = 0.5$ Oracle : 0.44 $\rho = 0.5$ Oracle : 0.45 $\rho = 0.5$ Oracle : 0.47 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.5$ Oracle : 0.49 $\rho = 0.5$ Oracle : 0.45 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.5$ Oracle : 0.45 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.5$ Oracle : 0.45 $\rho = 0.5$ Oracle : 0.48 $\rho = 0.$							
AIC 0.75 0.75 0.76 0.76 0.85						1.13	
BIC 0.75 0.75 0.76 0.85							$\rho = 0.5$
BIC 0.75 0.75 0.76 0.85 CV.Ise 0.38 0.36 0.32 0.26 0.33 CV.min 0.29 0.29 0.20 0.28 sd(μ)/σ = 2 $\rho = 0.9$ AICc 0.29 0.33 0.32 0.22 $\rho = 0.9$ AICc 0.19 0.19 0.20 0.18 Oracle : 0.11 Oracle : 0.11 0.19 0.20 0.20 0.30 Oracle : 0.11 Oracle : 0.11 0.19 0.20 0.30 Oracle : 0.11 0.19 0.20 0.20 0.30 Oracle : 0.11 0.20 0.18 0.20							$Oracle \cdot 0.43$
$\begin{array}{c} \text{CV.min} & 0.29 & 0.29 & 0.29 & 0.20 & 0.28 & \mathrm{sd}(\mu)/\sigma = 2 \\ \text{AICc} & 0.29 & 0.33 & 0.32 & 0.22 & \rho = 0.9 \\ \text{AIC} & 0.19 & 0.19 & 0.20 & 0.18 \\ \text{BIC} & 0.20 & 0.20 & 0.20 & 0.30 & \\ \text{CV.Ise} & 7.53 & 7.48 & 7.59 & 6.10 & 7.45 \\ \text{CV.min} & 6.40 & 6.61 & 7.19 & 6.97 & 6.46 & \mathrm{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 6.35 & 7.08 & 7.66 & 5.83 & \rho = 0 \\ \text{AIC} & 7.68 & 7.71 & 7.80 & 7.45 & \\ \text{BIC} & 7.67 & 7.71 & 7.80 & 7.42 & \\ \text{CV.nin} & 2.76 & 2.79 & 2.88 & 2.75 & 2.75 & \mathrm{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 2.72 & 2.92 & 2.94 & 2.47 & \rho = 0.5 \\ \text{AIC} & 3.01 & 3.02 & 3.05 & 2.93 \\ \text{BIC} & 3.00 & 3.01 & 3.04 & 2.92 & \\ \text{CV.nin} & 0.65 & 0.64 & 0.63 & 0.62 & 0.63 & \mathrm{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 0.76 & 0.74 & 0.68 & 0.65 & 0.71 & \\ \text{CV.nin} & 0.65 & 0.64 & 0.63 & 0.62 & 0.63 & \mathrm{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 0.78 & 0.78 & 0.80 & 0.64 & \\ \text{CV.Ise} & 19.79 & 19.80 & 19.81 & 23.84 & 19.80 \\ \text{CV.Ise} & 19.79 & 19.80 & 19.81 & 23.84 & 19.80 & \\ \text{CV.Ise} & 19.79 & 19.80 & 19.81 & 23.84 & 19.80 & \\ \text{CV.Ise} & 19.76 & 19.83 & 19.97 & 28.51 & 19.86 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \text{AIC} & 30.82 & 30.99 & 31.25 & 30.32 & \\ \text{BIC} & 30.81 & 30.98 & 31.25 & 30.30 & \\ \text{CV.Ise} & 7.76 & 7.76 & 7.77 & 7.81 & 10.85 & 7.79 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \text{AIC} & 12.08 & 12.13 & 12.24 & 11.88 & \\ \text{BIC} & 12.07 & 12.12 & 12.23 & 11.86 & \\ \text{CV.Ise} & 2.04 & 2.04 & 2.04 & 2.02 & 2.04 \\ \text{CV.min} & 2.00 & 2.00 & 2.02 & 2.23 & 2.00 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \text{AIC} & 1.98 & 2.01 & 2.75 & 2.08 & & \rho = 0.9 \\ \text{AIC} & 3.16 & 3.17 & 3.21 & 3.02 & \\ \text{Oracle} : 180 & \text{Oracle} : 180 \\ \text{Oracle} : 180 \\ \text{Oracle} : 180 \\ \text{Oracle} : 180 \\ Or$							074666 . 0.43
AICc 0.29 0.33 0.32 0.22 $\rho = 0.9$ AIC 0.19 0.19 0.20 0.18 $\rho = 0.9$ Display 0.20 0.20 0.20 0.30 $\rho = 0.9$ Display 0.20 0.30 $\rho = 0.9$ Display 0.20 0.20 0.30 $\rho = 0.9$ Display 0.20 0.30 Display 0.20 0.20 0.30 Display 0.20 0.20 Display 0.20 0.20 Display 0.20 0.20 0.20 0.20 0.20 0.20 0.20 0.2	CV.1se	0.38	0.36	0.32	0.26	0.33	
AIC 0.19 0.19 0.20 0.20 0.30	CV.min					0.28	
BIC 0.20 0.20 0.20 0.30							$\rho = 0.9$
BIC 0.20 0.20 0.20 0.30 CV.1se 7.53 7.48 7.59 6.10 7.45 CV.min 6.40 6.61 7.19 6.97 6.46 $sd(\mu)/\sigma = 1$ AIC 6.35 7.08 7.66 5.83 $\rho = 0$ AIC 7.68 7.71 7.80 7.45 Oracle : 4.37 CV.1se 3.04 3.03 3.00 2.54 3.00 cv.min CV.min 2.76 2.79 2.88 2.75 2.75 $sd(\mu)/\sigma = 1$ AIC 3.01 3.02 3.05 2.93 Oracle : 1.71 CV.nin 0.50 0.74 0.68 0.65 0.71 DV.1se 0.76 0.74 0.68 0.65 0.71 CV.min 0.65 0.64 0.63 0.62 0.63 $sd(\mu)/\sigma = 1$ AIC 0.78 0.78 0.80 0.71 Oracle : 0.45 CV.lse 19.79 19.80 19.81							Oracle : 0.11
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC						074666.0.11
AICc 6.35 7.08 7.66 5.83 $\rho = 0$ AIC 7.68 7.71 7.80 7.45 $\rho = 0$ BIC 7.67 7.71 7.80 7.42 $\rho = 0$ CV.1se 3.04 3.03 3.00 2.54 3.00 $\rho = 0$ CV.min 2.76 2.79 2.88 2.75 2.75 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 $\rho = 0.5$ BIC 3.00 3.01 3.04 2.92 $\rho = 0.5$ CV.se 0.76 0.74 0.68 0.65 0.71 $\rho = 0.5$ AICc 0.64 0.68 0.66 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.64 $\rho = 0.9$ CV.se 19.79 19.80 19.81 23.84 19.80 $\rho = 0.5$ AIC 30.82 30.99 31.25 30.32 $\rho = 0.5$ AIC 30.82 30.99 31.25 30.32 $\rho = 0.5$ AIC 30.81 30.98 31.25 30.30 $\rho = 0.5$ AIC 7.68 7.76 7.77 7.81 10.85 7.79 $\rho = 0.5$ AIC 7.68 7.76 7.77 7.81 10.85 7.79 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 $\rho = 0.5$ AIC 1.208 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 $\rho = 0.9$ AIC 1.98 2.01 2.75 2.08 $\rho = 0.9$	CV.1se	7.53	7.48	7.59		7.45	
AIC 7.68 7.71 7.80 7.45 $Oracle: 4.37$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.38$ $Oracle: 4.39$ $Oracle: 4$	CV.min	6.40	6.61	7.19	6.97	6.46	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 7.67 7.71 7.80 7.42 Oracle : 4.37 CV.1se 3.04 3.03 3.00 2.54 3.00 $sd(\mu)/\sigma = 1$ AIC 2.76 2.79 2.88 2.75 2.75 $sd(\mu)/\sigma = 1$ AIC 3.01 3.02 3.05 2.93 Oracle : 1.71 CV.1se 0.76 0.74 0.68 0.65 0.71 CV.nin 0.65 0.64 0.63 0.62 0.63 $sd(\mu)/\sigma = 1$ AIC 0.78 0.78 0.80 0.71 Oracle : 0.45 BIC 0.78 0.78 0.80 0.71 Oracle : 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 $sd(\mu)/\sigma = 0.5$ AIC 19.54 20.74 31.03 20.74 $\rho = 0.5$ $\rho = 0.5$ AIC 19.54 20.74 31.03 20.74 $\rho = 0.5$ $\rho = 0.5$ AIC 30.81 30.98 31.25 30.30 $\rho = 0.$	AICc	6.35	7.08	7.66	5.83		$\rho = 0$
BIC 7.67 7.71 7.80 7.42 CV.1se 3.04 3.03 3.00 2.54 3.00 CV.min 2.76 2.79 2.88 2.75 2.75 $sd(\mu)/\sigma = 1$ AIC 2.72 2.92 2.94 2.47 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 Oracle: 1.71 CV.1se 0.76 0.74 0.68 0.65 0.71 Oracle: 1.71 CV.min 0.65 0.64 0.63 0.62 0.63 $sd(\mu)/\sigma = 1$ AIC 0.78 0.78 0.80 0.71 Oracle: 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.nin 19.76 19.83 19.97 28.51 19.86 $sd(\mu)/\sigma = 0.5$ AIC 19.54 20.74 31.03 20.74 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 CV.1se 7.76 7.7	AIC	7.68	7.71	7.80	7.45		Ongolo : 4 27
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	7.67	7.71	7.80	7.42		Oracie: 4.57
AICc 2.72 2.92 2.94 2.47 $\rho = 0.5$ AIC 3.01 3.02 3.05 2.93 $Oracle : 1.71$ BIC 3.00 3.01 3.04 2.92 $Oracle : 1.71$ CV.1se 0.76 0.74 0.68 0.65 0.71 $Oracle : 1.71$ AIC 0.65 0.64 0.63 0.62 0.63 $Oracle : 1.71$ AIC 0.78 0.78 0.80 0.71 $Oracle : 0.45$ BIC 0.78 0.78 0.80 0.64 $Oracle : 0.45$ BIC 0.78 0.78 0.80 0.64 $Oracle : 0.45$ CV.1se 19.79 19.80 19.81 23.84 19.80 $Oracle : 0.45$ AIC 19.54 20.74 31.03 20.74 $Oracle : 0.5$ AIC 30.82 30.99 31.25 30.32 $Oracle : 17.46$ BIC 30.81 30.98 31.25 30.30 $Oracle : 17.46$ CV.1se 7.76 7.76 7.77 9.11 7.76 $Oracle : 17.46$ CV.1se 7.76 7.77 7.81 10.85 7.79 $Oracle : 17.46$ AIC 12.08 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 $Oracle : 1.80$ AIC 1.98 2.01 2.75 2.08 $Oracle : 1.80$ AIC 1.98 2.01 2.75 2.08 $Oracle : 1.80$ AIC 1.98 2.01 2.75 2.08 $Oracle : 1.80$	CV.1se	3.04	3.03	3.00	2.54	3.00	
AIC 3.01 3.02 3.05 2.93 $Oracle : 1.71$ BIC 3.00 3.01 3.04 2.92 CV.1se 0.76 0.74 0.68 0.65 0.71 $Oracle : 1.71$ AIC 0.65 0.64 0.63 0.62 0.63 $Oracle : 1.71$ AIC 0.78 0.78 0.78 0.80 0.71 $Oracle : 0.45$ BIC 0.78 0.78 0.80 0.64 CV.min 19.76 19.83 19.97 28.51 19.86 $Oracle : 0.45$ AIC 30.82 30.99 31.25 30.32 $Oracle : 1.71$ BIC 30.81 30.98 31.25 30.30 CV.1se 7.76 7.77 7.81 10.85 7.79 $Oracle : 1.71$ AIC 7.68 7.76 12.06 8.19 $Oracle : 0.81$ AIC 12.08 12.13 12.24 11.88 $Oracle : 0.81$ BIC 12.07 12.12 12.23 11.86 CV.1se 2.04 2.04 2.04 2.02 2.04 $Oracle : 1.80$ AIC 1.98 2.01 2.75 2.08 $Oracle : 1.80$ AIC 1.98 2.01 2.75 2.08 $Oracle : 1.80$ AIC 1.98 2.01 2.75 2.08 AIC 1.71 AIC 1.72 AIC 1.74 AIC 1.75 AI	CV.min	2.76	2.79	2.88	2.75	2.75	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 3.00 3.01 3.04 2.92 CV.1se 0.76 0.74 0.68 0.65 0.71 CV.min 0.65 0.64 0.63 0.62 0.63 $sd(\mu)/\sigma = 1$ AIC 0.64 0.68 0.66 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 Oracle : 0.45 BIC 0.78 0.78 0.80 0.64 Dracle : 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.nin 19.76 19.83 19.97 28.51 19.86 $sd(\mu)/\sigma = 0.5$ AIC 19.54 20.74 31.03 20.74 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 Oracle : 17.46 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AIC 12.08 12.13 12.2	AICc	2.72	2.92	2.94	2.47		$\rho = 0.5$
BIC 3.00 3.01 3.04 2.92 CV.1se 0.76 0.74 0.68 0.65 0.71 CV.min 0.65 0.64 0.63 0.62 0.63 $sd(\mu)/\sigma = 1$ AIC 0.64 0.68 0.66 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 Oracle: 0.45 CV.1se 19.79 19.80 19.81 23.84 19.80 $sd(\mu)/\sigma = 0.5$ CV.min 19.76 19.83 19.97 28.51 19.86 $sd(\mu)/\sigma = 0.5$ AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 BIC 30.81 30.98 31.25 30.30 Oracle: 17.46 CV.1se 7.76 7.77 9.11 7.76 $\rho = 0.5$ AIC 7.68 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 BIC <td>AIC</td> <td>3.01</td> <td>3.02</td> <td>3.05</td> <td>2.93</td> <td></td> <td>Ongolo i 1 71</td>	AIC	3.01	3.02	3.05	2.93		Ongolo i 1 71
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	3.00	3.01	3.04	2.92		Oracie: 1.71
AICc 0.64 0.68 0.66 0.61 $\rho = 0.9$ AIC 0.78 0.78 0.80 0.71 $\rho = 0.9$ Oracle : 0.45 DIC 0.78 0.78 0.80 0.64 $\rho = 0.9$ Oracle : 0.45 DIC 0.78 0.78 0.80 0.64 $\rho = 0.9$ Oracle : 0.45 DIC 0.78 0.78 0.80 0.64 $\rho = 0.9$ Oracle : 0.45 DIC 0.78 0.79 0.80 0.64 $\rho = 0.9$ Oracle : 0.45 DIC 0.78 0.79 0.80 0.64 $\rho = 0.9$ Oracle : 0.45 DIC 0.79 0.79 0.79 0.79 DIC 0.70 DIC 0.79 DIC 0	CV.1se	0.76	0.74	0.68	0.65	0.71	
AIC 0.78 0.78 0.80 0.80 0.64 $Oracle : 0.45$	CV.min	0.65	0.64	0.63	0.62	0.63	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 0.78 0.78 0.80 0.64 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.min 19.76 19.83 19.97 28.51 19.86 $sd(\mu)/\sigma = 0.5$ AICc 19.54 20.74 31.03 20.74 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AICc 7.68 7.76 12.06 8.19 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 CV.1se 2.04 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AICc 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21	AICc	0.64	0.68	0.66	0.61		$\rho = 0.9$
BIC 0.78 0.78 0.80 0.64 CV.1se 19.79 19.80 19.81 23.84 19.80 CV.min 19.76 19.83 19.97 28.51 19.86 $sd(\mu)/\sigma = 0.5$ AICc 19.54 20.74 31.03 20.74 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 EV.1se 7.76 7.76 7.77 9.11 7.76 $raccle: 17.46$ CV.nin 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AICc 7.68 7.76 12.06 8.19 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 $\rho = 0.5$ BIC 12.07 12.12 12.23 11.86 $\rho = 0.5$ CV.nin 2.00 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AIC 1.98 <td>AIC</td> <td>0.78</td> <td>0.78</td> <td>0.80</td> <td>0.71</td> <td></td> <td>Oma ala . 0.45</td>	AIC	0.78	0.78	0.80	0.71		Oma ala . 0.45
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.78	0.78	0.80	0.64		Oracie: 0.43
AICc 19.54 20.74 31.03 20.74 $\rho = 0$ AIC 30.82 30.99 31.25 30.32 $\rho = 0$ Oracle : 17.46 BIC 30.81 30.98 31.25 30.30 $\rho = 0$ Oracle : 17.46 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 BIC 12.07 12.12 12.23 11.86 $\rho = 0.5$ CV.1se 2.04 2.04 2.04 2.02 2.04 $\rho = 0.5$ AIC 1.98 2.01 2.75 2.08 $\rho = 0.5$ AIC 3.16 3.17 3.21 3.02 $\rho = 0.5$ $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	CV.1se	19.79	19.80	19.81	23.84	19.80	
AIC 30.82 30.99 31.25 30.32 Oracle: 17.46 BIC 30.81 30.98 31.25 30.30 Oracle: 17.46 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 sd(μ)/σ = 0.5 AICc 7.68 7.76 12.06 8.19 ρ = 0.5 AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 column (column) column	CV.min	19.76	19.83	19.97	28.51	19.86	$\operatorname{sd}(\mu)/\sigma = 0.5$
BIC 30.81 30.98 31.25 30.30 Oracle: 17.46 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AICc 7.68 7.76 12.06 8.19 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 $cd(\mu)/\sigma = 0.5$ AICc 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 Oracle: 1.80	AICc	19.54	20.74	31.03	20.74		$\rho = 0$
BIC 30.81 30.98 31.25 30.30 CV.1se 7.76 7.76 7.77 9.11 7.76 CV.min 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AIC 7.68 7.76 12.06 8.19 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 $sd(\mu)/\sigma = 0.5$ AIC 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 Oracle: 1.80	AIC	30.82	30.99	31.25	30.32		Oma ala . 17 46
CV.min 7.76 7.77 7.81 10.85 7.79 $sd(\mu)/\sigma = 0.5$ AIC 7.68 7.76 12.06 8.19 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 $Oracle : 6.84$ BIC 12.07 12.12 12.23 11.86 $Oracle : 6.84$ CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 $Oracle : 1.80$	BIC	30.81	30.98	31.25	30.30		Oracie: 17.40
AICc 7.68 7.76 12.06 8.19 $\rho = 0.5$ AIC 12.08 12.13 12.24 11.88 $Oracle: 6.84$ BIC 12.07 12.12 12.23 11.86 $Oracle: 6.84$ CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AICc 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 $Oracle: 1.80$	CV.1se	7.76	7.76	7.77	9.11	7.76	
AIC 12.08 12.13 12.24 11.88 Oracle: 6.84 BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 Oracle: 1.80	CV.min	7.76	7.77	7.81	10.85	7.79	$\operatorname{sd}(\mu)/\sigma = 0.5$
BIC 12.07 12.12 12.23 11.86 Oracle: 6.84 CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AICc 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 Oracle: 1.80	AICc	7.68	7.76	12.06	8.19		$\rho = 0.5$
BIC 12.07 12.12 12.23 11.86 CV.1se 2.04 2.04 2.02 2.04 CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AIC 3.16 3.17 3.21 3.02 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02 $\rho = 0.9$	AIC	12.08	12.13	12.24	11.88		Omada: 604
CV.min 2.00 2.00 2.02 2.23 2.00 $sd(\mu)/\sigma = 0.5$ AIC 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	BIC	12.07	12.12	12.23	11.86		Oracie: 0.84
AICc 1.98 2.01 2.75 2.08 $\rho = 0.9$ AIC 3.16 3.17 3.21 3.02	CV.1se	2.04	2.04	2.04	2.02	2.04	
AIC 3.16 3.17 3.21 3.02 Oracle: 1.80	CV.min	2.00	2.00	2.02	2.23	2.00	$\operatorname{sd}(\mu)/\sigma = 0.5$
Uracle: 1 XII	AICc	1.98	2.01	2.75	2.08		$\rho = 0.9$
BIC 3.16 3.17 3.21 2.43	AIC	3.16	3.17	3.21	3.02		Omada . 1 90
	BIC	3.16	3.17	3.21	2.43		Oracie: 1.00

Table 56: Estimation MSE for n=100, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$				
CV.1se	6.03	5.47	7.37	3.39	4.50	
CV.min	3.66	3.54	5.12	3.45	3.45	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.24	3.93	3.83	3.46		$\rho = 0$
AIC	3.93	3.94	4.01	3.72		Oracle: 2.26
BIC	3.93	3.94	4.00	3.71		Oracic . 2.20
CV.1se	3.71	3.68	3.68	1.86	3.59	
CV.min	2.90	3.04	3.39	1.52	2.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	2.94	3.45	1.54	2.11		$\rho = 0.5$
AIC	1.51	1.51	1.53	1.48		Oracle: 0.86
BIC	1.51	1.51	1.53	1.51		07466.0.00
CV.1se	0.76	0.73	0.66	0.55	0.64	
CV.min	0.55	0.55	0.57	0.41	0.54	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.56	0.68	0.61	0.47		$\rho = 0.9$
AIC	0.34	0.34	0.34	0.33		Oracle: 0.19
BIC	0.34	0.34	0.34	0.55		07466.0.19
CV.1se	15.86	15.92	16.11	12.87	15.83	
CV.min	13.74	14.70	15.65	14.59	13.88	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	13.72	15.18	16.02	12.39		$\rho = 0$
AIC	15.92	16.01	16.18	15.51		Oracle : 9.05
BIC	15.91	16.00	16.18	15.49		Oracie : 9.03
CV.1se	6.15	6.15	6.15	5.16	6.14	
CV.min	5.74	5.87	6.06	5.58	5.74	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.67	6.04	6.02	5.09		$\rho = 0.5$
AIC	6.05	6.07	6.13	5.93		<i>Oracle</i> : 3.43
BIC	6.05	6.07	6.13	5.92		07 acte . 5.45
CV.1se	1.38	1.37	1.35	1.20	1.34	
CV.min	1.24	1.24	1.28	1.13	1.21	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.22	1.34	1.32	1.13		$\rho = 0.9$
AIC	1.36	1.37	1.38	1.30		Oracle: 0.78
BIC	1.36	1.36	1.38	1.25		Oracie: 0.78
CV.1se	41.10	41.10	41.16	49.82	41.10	
CV.min	41.17	41.36	41.49	59.63	41.39	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	40.65	49.38	64.74	43.30		$\rho = 0$
AIC	64.05	64.49	65.00	63.04		Oracle : 36.24
BIC	64.02	64.47	64.99	63.01		07 acte : 30.24
CV.1se	15.53	15.54	15.54	18.34	15.53	
CV.min	15.56	15.59	15.65	21.83	15.63	$sd(\mu)/\sigma = 0.5$
AICc	15.41	15.84	24.32	16.43		$\rho = 0.5$
AIC	24.20	24.32	24.53	23.82		<i>Oracle</i> : 13.70
BIC	24.18	24.31	24.52	23.81		Oracle : 15.70
CV.1se	3.54	3.54	3.54	3.58	3.54	
CV.min	3.52	3.54	3.55	3.95	3.53	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	3.49	3.53	5.40	3.67		$\rho = 0.9$
AIC	5.47	5.49	5.56	5.28		Oracle : 3.12
BIC	5.46	5.49	5.56	4.57		01 ucie : 5.12

Table 57: Estimation MSE for n=100, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$			sparsenet MCP	
CV.1se	6.74	6.11	8.34	3.77	5.04	
CV.min	4.07	3.93	5.96	3.83	3.85	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.70	4.30	4.30	3.84		$\rho = 0$
AIC	4.38	4.39	4.46	4.14		Oracle: 2.52
BIC	4.37	4.39	4.46	4.13		Oracic . 2.32
CV.1se	4.12	4.10	4.10	2.07	4.02	
CV.min	3.23	3.39	3.79	1.69	3.19	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.30	3.84	1.71	2.35		$\rho = 0.5$
AIC	1.67	1.68	1.70	1.64		Oracle: 0.95
BIC	1.67	1.68	1.70	1.69		Oracle . 0.93
CV.1se	0.84	0.81	0.74	0.61	0.71	
CV.min	0.61	0.61	0.63	0.46	0.60	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.62	0.75	0.66	0.51		$\rho = 0.9$
AIC	0.37	0.37	0.38	0.36		Oracle : 0.21
BIC	0.37	0.38	0.38	0.59		07acie . 0.21
CV.1se	17.65	17.73	17.88	14.30	17.57	
CV.min	15.29	16.38	17.43	16.22	15.41	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	15.27	16.82	17.83	13.78		$\rho = 0$
AIC	17.69	17.80	17.98	17.24		Oracle : 10.05
BIC	17.68	17.79	17.98	17.21		Oracie: 10.03
CV.1se	6.83	6.83	6.83	5.74	6.82	
CV.min	6.38	6.54	6.74	6.19	6.38	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.30	6.72	6.70	5.66		$\rho = 0.5$
AIC	6.71	6.74	6.80	6.59		Oracle : 3.80
BIC	6.71	6.73	6.80	6.58		Oracle . 5.80
CV.1se	1.53	1.52	1.50	1.33	1.49	
CV.min	1.37	1.37	1.43	1.25	1.35	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.35	1.49	1.45	1.25		$\rho = 0.9$
AIC	1.50	1.51	1.53	1.44		Oracle : 0.86
BIC	1.50	1.51	1.53	1.40		Oracie: 0.80
CV.1se	45.57	45.59	45.62	55.20	45.57	
CV.min	45.65	45.85	45.98	66.11	45.94	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	45.06	56.09	71.78	48.00		$\rho = 0$
AIC	70.97	71.48	72.03	69.85		Oracle : 40.18
BIC	70.94	71.46	72.01	69.82		07 acte : 40.16
CV.1se	17.26	17.26	17.27	20.38	17.26	
CV.min	17.28	17.32	17.40	24.29	17.37	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	17.13	17.71	27.06	18.28		$\rho = 0.5$
AIC	26.90	27.05	27.27	26.48		Oracle: 15.23
BIC	26.89	27.04	27.27	26.47		Oracle: 13.23
CV.1se	3.90	3.90	3.90	3.96	3.90	
CV.min	3.89	3.90	3.92	4.37	3.90	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	3.86	3.90	5.99	4.06		$\rho = 0.9$
AIC	6.03	6.06	6.14	5.83		Oracle : 3.44
BIC	6.03	6.06	6.13	5.05		07 acie : 5.44

Table 58: Estimation MSE for n=100, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	7.14	6.46	8.81	3.97	5.31	
CV.min	4.29	4.15	6.14	4.04	4.07	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.01	4.53	4.53	4.04		$\rho = 0$
AIC	4.62	4.63	4.71	4.36		Oracle : 2.65
BIC	4.61	4.62	4.70	4.35		Oracie . 2.03
CV.1se	4.35	4.31	4.32	2.18	4.24	
CV.min	3.40	3.59	4.01	1.78	3.37	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.48	4.06	1.81	2.47		$\rho = 0.5$
AIC	1.77	1.77	1.79	1.73		Oracle: 1.00
BIC	1.77	1.77	1.79	1.79		Oracie: 1.00
CV.1se	0.89	0.85	0.78	0.65	0.75	
CV.min	0.64	0.64	0.67	0.49	0.63	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.66	0.79	0.69	0.54		$\rho = 0.9$
AIC	0.39	0.40	0.40	0.38		, , , , , , ,
BIC	0.39	0.40	0.40	0.62		Oracle: 0.23
CV.1se	18.66	18.75	18.91	15.12	18.55	
CV.min	16.14	17.34	18.41	17.11	16.33	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	16.16	17.75	18.84	14.55		$\rho = 0$
AIC	18.68	18.80	18.99	18.21		,
BIC	18.67	18.79	18.99	18.18		Oracle: 10.62
CV.1se	7.19	7.19	7.19	6.05	7.19	
CV.min	6.72	6.89	7.10	6.52	6.72	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.63	7.07	7.06	5.96		$\rho = 0.5$
AIC	7.07	7.10	7.17	6.94		,
BIC	7.07	7.10	7.17	6.93		Oracle: 4.01
CV.1se	1.61	1.60	1.58	1.40	1.56	
CV.min	1.45	1.45	1.50	1.32	1.42	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.42	1.57	1.53	1.32		$\rho = 0.9$
AIC	1.59	1.59	1.61	1.52		,
BIC	1.58	1.59	1.61	1.47		Oracle: 0.91
CV.1se	48.12	48.15	48.19	58.23	48.13	
CV.min	48.20	48.43	48.57	69.84	48.51	$sd(\mu)/\sigma = 0.5$
AICc	47.6	59.96	75.78	50.67		$\rho = 0$
AIC	74.93	75.47	76.04	73.75		,
BIC	74.89	75.44	76.03	73.72		Oracle: 42.43
CV.1se	18.22	18.22	18.23	21.49	18.22	
CV.min	18.26	18.28	18.35	25.58	18.33	$sd(\mu)/\sigma = 0.5$
AICc	18.08	18.83	28.56	19.27	10.55	$\rho = 0.5$
AIC	28.38	28.53	28.78	27.94		,
BIC	28.36	28.52	28.77	27.92		Oracle: 16.07
CV.1se	4.11	4.11	4.11	4.17	4.11	
CV.13c	4.10	4.11	4.14	4.61	4.11	$sd(\mu)/\sigma = 0.5$
AICc	4.07	4.11	6.32	4.28	1.11	$\rho = 0.9$
AIC	6.36	6.39	6.47	6.14		,
BIC	6.36	6.39	6.47	5.28		Oracle: 3.62
DIC	0.50	0.37	0.47	3.20		

Table 59: Estimation MSE for n=1000, binary design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	0.34	0.34	0.33	0.33	0.32	
CV.min	0.32	0.32	0.31	0.32	0.31	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.32	0.32	0.31	0.32		$\rho = 0$
AIC	0.42	0.42	0.45	0.32		Oracle : 0.30
BIC	0.35	0.34	0.32	0.33		07466 . 0.30
CV.1se	0.31	0.30	0.29	0.30	0.29	
CV.min	0.29	0.29	0.28	0.29	0.28	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.29	0.29	0.28	0.29		$\rho = 0.5$
AIC	0.37	0.38	0.40	0.29		Oracle : 0.26
BIC	0.32	0.31	0.29	0.30		Oracle . 0.20
CV.1se	0.29	0.29	0.28	0.28	0.27	
CV.min	0.28	0.27	0.26	0.27	0.26	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.28	0.27	0.26	0.27		$\rho = 0.9$
AIC	0.35	0.35	0.37	0.27		Oma ala . 0.25
BIC	0.30	0.29	0.27	0.28		Oracle: 0.25
CV.1se	1.34	1.32	1.29	1.25	1.27	
CV.min	1.26	1.25	1.23	1.28	1.23	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.26	1.25	1.27	1.27		$\rho = 0$
AIC	1.85	1.87	2.00	1.31		·
BIC	1.35	1.31	1.28	1.27		Oracle: 1.17
CV.1se	1.21	1.18	1.15	1.12	1.13	
CV.min	1.14	1.12	1.1	1.15	1.1	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.14	1.12	1.13	1.13		$\rho = 0.5$
AIC	1.65	1.67	1.78	1.18		
BIC	1.22	1.18	1.15	1.14		Oracle: 1.05
CV.1se	1.14	1.12	1.09	1.06	1.07	
CV.min	1.08	1.06	1.04	1.08	1.04	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.08	1.06	1.07	1.08		$\rho = 0.9$
AIC	1.55	1.57	1.68	1.11		
BIC	1.16	1.12	1.09	1.09		Oracle: 0.99
CV.1se	5.21	5.16	5.11	4.90	5.07	
CV.nin	4.93	4.89	4.90	5.20	4.89	$sd(\mu)/\sigma = 0.5$
AICc	4.92	4.89	5.17	5.08	.,,,	$\rho = 0$
AIC	7.90	8.06	8.55	6.07		·
BIC	5.13	5.09	5.21	4.95		Oracle: 4.66
CV.1se	4.68	4.62	4.57	4.39	4.53	
CV.rise CV.min	4.42	4.38	4.38	4.67	4.37	$sd(\mu)/\sigma = 0.5$
AICc	4.41	4.38	4.62	4.55	11.07	$\rho = 0.5$
AIC	7.06	7.19	7.62	5.44		,
BIC	4.62	4.57	4.64	4.46		<i>Oracle</i> : 4.16
CV.1se	4.43	4.38	4.33	4.17	4.28	
CV.1sc CV.min	4.18	4.15	4.16	4.40	4.14	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.18	4.15	4.10	4.40	7.17	$\beta d(\mu)/\delta = 0.3$ $\rho = 0.9$
AICC	6.66	6.78	7.20	5.08		,
BIC	4.39		7.20 4.41	4.23		Oracle: 3.93
БІС	4.39	4.34	4.41	4.23		

Table 60: Estimation MSE for n=1000, binary design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	*	
CV.1se	2.22	2.18	2.18	2.15	2.10	
CV.min	2.07	2.03	2.05	2.07	2.01	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	2.14	2.06	2.04	2.09		$\rho = 0$
AIC	2.52	2.56	2.73	2.07		Oracle : 1.77
BIC	2.82	2.60	2.38	2.47		Oracic . 1.77
CV.1se	1.99	1.96	1.95	1.95	1.88	
CV.min	1.85	1.82	1.83	1.87	1.79	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.93	1.85	1.82	1.89		$\rho = 0.5$
AIC	2.25	2.28	2.43	1.87		Oracle : 1.57
BIC	2.63	2.38	2.13	2.27		Oracle . 1.57
CV.1se	1.87	1.84	1.83	1.85	1.77	
CV.min	1.75	1.71	1.72	1.77	1.69	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.82	1.75	1.71	1.79		$\rho = 0.9$
AIC	2.11	2.14	2.28	1.77		Oracle : 1.48
BIC	2.50	2.27	2.00	2.16		Oracie: 1.48
CV.1se	8.48	8.43	8.71	7.83	8.19	
CV.min	7.81	7.79	8.13	7.85	7.79	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.91	7.76	8.54	7.80		$\rho = 0$
AIC	10.67	10.91	11.60	8.52		
BIC	10.46	9.64	10.63	8.90		Oracle: 6.88
CV.1se	7.64	7.56	7.75	7.05	7.34	
CV.min	7.00	6.96	7.23	7.05	6.98	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.11	6.95	7.54	7.01		$\rho = 0.5$
AIC	9.49	9.69	10.29	7.65		
BIC	9.75	8.86	9.54	8.14		<i>Oracle</i> : 6.11
CV.1se	7.20	7.13	7.36	6.69	6.92	
CV.min	6.61	6.57	6.86	6.67	6.59	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.72	6.56	7.11	6.64		$\rho = 0.9$
AIC	8.92	9.11	9.68	7.18		
BIC	9.29	8.44	9.08	7.77		<i>Oracle</i> : 5.75
CV.1se	30.41	30.51	30.62	28.92	30.45	
CV.min	28.91	29.51	30.38	30.23	28.94	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	28.81	29.04	32.33	29.50		$\rho = 0$
AIC	44.19	45.58	47.69	36.58		
BIC	30.59	30.57	30.65	30.31		<i>Oracle</i> : 26.71
CV.1se	27.07	27.11	27.19	25.86	27.08	
CV.min	25.89	26.35	27.03	27.01	25.93	$sd(\mu)/\sigma = 0.5$
AICc	25.77	25.89	29.02	26.38		$\rho = 0.5$
AIC	39.26	40.45	42.30	32.78		,
BIC	27.17	27.16	27.20	26.98		Oracle: 23.69
CV.1se	25.52	25.57	25.62	24.47	25.56	
CV.nsc	24.45	24.87	25.48	25.45	24.47	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	24.32	24.42	27.06	24.91	,	$\rho = 0.9$
AIC	36.90	38.04	39.80	30.65		,
BIC	25.60	25.59	25.63	25.45		<i>Oracle</i> : 22.33
	25.00	43.33	45.05	4J.7J		

Table 61: Estimation MSE for n=1000, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$				
CV.1se	4.93	4.93	5.13	4.95	4.74	
CV.min	4.56	4.55	4.77	4.69	4.54	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.97	4.74	4.69	4.82		$\rho = 0$
AIC	5.26	5.36	5.71	4.65		Oracle: 3.92
BIC	11.76	7.65	5.74	6.80		074666 . 3.72
CV.1se	4.43	4.41	4.59	4.50	4.26	
CV.min	4.09	4.06	4.25	4.25	4.06	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.49	4.27	4.16	4.37		$\rho = 0.5$
AIC	4.68	4.76	5.06	4.19		Oracle : 3.47
BIC	12.00	7.34	5.10	6.48		Oracie: 5.47
CV.1se	4.17	4.16	4.31	4.30	4.00	
CV.min	3.86	3.83	3.99	4.04	3.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.24	4.03	3.93	4.17		$\rho = 0.9$
AIC	4.40	4.47	4.76	3.97		Oracle : 3.27
BIC	11.64	7.13	4.80	6.31		Oracle : 5.21
CV.1se	18.86	19.46	22.40	17.23	18.29	
CV.min	16.91	17.35	20.03	17.04	16.91	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	17.48	17.08	18.88	17.04		$\rho = 0$
AIC	21.90	22.52	23.77	18.38		
BIC	24.64	24.28	24.73	22.96		<i>Oracle</i> : 14.88
CV.1se	17.09	17.59	20.25	15.52	16.55	
CV.min	15.17	15.53	18.18	15.31	15.17	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	15.75	15.30	16.73	15.32		$\rho = 0.5$
AIC	19.43	19.95	21.04	16.45		
BIC	21.85	21.67	21.93	20.83		<i>Oracle</i> : 13.17
CV.1se	16.11	16.52	19.24	14.72	15.62	
CV.min	14.32	14.64	17.15	14.48	14.33	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	14.91	14.44	15.77	14.52	- 1.00	$\rho = 0.9$
AIC	18.27	18.76	19.80	15.47		
BIC	20.60	20.48	20.64	19.70		<i>Oracle</i> : 12.42
CV.1se	61.85	61.95	61.96	59.96	61.90	
CV.nin	60.09	61.49	61.94	62.57	60.06	$sd(\mu)/\sigma = 0.5$
AICc	59.74	61.12	64.65	60.97		$\rho = 0$
AIC	89.79	93.17	96.87	76.06		
BIC	61.93	61.94	61.96	61.79		<i>Oracle</i> : 56.30
CV.1se	54.84	54.89	54.90	53.43	54.87	
CV.nsc CV.min	53.63	54.59	54.90	55.72	53.68	$sd(\mu)/\sigma = 0.5$
AICc	53.28	54.24	57.69	54.35	33.00	$\rho = 0.5$
AIC	79.60	82.49	85.78	67.95		
BIC	54.88	54.89	54.90	54.78		<i>Oracle</i> : 49.87
CV.1se	51.68	51.71	51.72	50.51	51.71	
CV.1se CV.min	50.61	51.71	51.72	52.52	50.62	$sd(\mu)/\sigma = 0.5$
AICc	50.01 50.25	51.47	54.14	51.30	50.02	$\rho = 0.9$
AICC	74.83	77.59	80.74	63.52		$\rho = 0.9$
BIC				51.63		<i>Oracle</i> : 46.94
ыс	51.70	51.70	51.72	31.03		

Table 62: Estimation MSE for n=1000, binary design, dense covariates, and decay 200.

CV.1se 11.14 11.67 14.02 11.52 10.67 CV.min 10.01 10.28 11.57 10.65 9.96 $sd(\mu)/\sigma =$ AIC 12.40 11.26 10.74 11.43 $\rho =$ AIC 10.87 11.12 11.75 10.29 Oracle : 8. BIC 31.02 30.70 22.48 28.59	= 0 .99 = 2 0.5
AICc 12.40 11.26 10.74 11.43 $\rho = AIC$ 10.87 11.12 11.75 10.29 BIC 31.02 30.70 22.48 28.59 Oracle : 8.	= 0 .99 = 2 0.5
AIC 10.87 11.12 11.75 10.29 BIC 31.02 30.70 22.48 28.59 Oracle : 8.	.99 = 2 0.5
BIC 31.02 30.70 22.48 28.59 <i>Oracle</i> : 8.	= 2 0.5
BIC 31.02 30.70 22.48 28.59	= 2 0.5
	0.5
CV.1se 10.11 10.55 13.01 10.54 9.67	0.5
CV.min 8.99 9.22 10.54 9.69 8.93 $sd(\mu)/\sigma =$	
AICc 11.39 10.18 9.56 10.45 $\rho = 0$.97
AIC 9.65 9.86 10.40 9.29 Oracle: 7.	.97
BIC 27.48 27.38 21.35 26.13	
CV.1se 9.46 9.91 12.60 10.08 9.07	
CV.min 8.46 8.67 9.98 9.21 8.41 $sd(\mu)/\sigma =$	= 2
AICc 10.75 9.61 9.01 9.99 $\rho = 0$	0.9
AIC 9.07 9.27 9.78 8.78 Oracle : 7.	51
BIC 25.87 25.76 20.43 24.77	.31
CV.1se 42.32 46.60 49.69 37.25 41.22	
CV.min 36.36 40.66 48.78 36.41 36.32 $sd(\mu)/\sigma =$	= 1
AICc 38.68 36.96 40.79 36.80 $\rho =$	
AIC 44.46 45.96 48.21 38.73	70
BIC 49.76 49.76 49.81 49.26 Oracle: 32.	./8
CV.1se 38.81 42.45 44.07 33.54 38.03	
CV.min 32.89 37.27 43.45 32.7 32.83 $sd(\mu)/\sigma =$	= 1
AICc 35.14 33.13 36.23 33.10 $\rho = 0$	
AIC 39.44 40.71 42.68 34.60	0.2
BIC 44.09 44.08 44.12 43.75 Oracle: 29.	.03
CV.1se 36.66 39.88 41.48 31.83 36.00	
CV.min 31.09 34.94 40.95 30.91 31.05 $sd(\mu)/\sigma =$	= 1
AICc 33.09 31.24 34.04 31.35 $\rho = 0$	
AIC 37.06 38.26 40.14 32.51	
BIC 41.50 41.50 41.53 41.22 Oracle: 27.	.37
CV.1se 124.61 124.67 124.67 122.31 124.65	
CV.min 122.59 124.58 124.76 127.56 122.60 $\operatorname{sd}(\mu)/\sigma = 0$	0.5
AICc 121.94 127.84 127.54 124.38 $\rho =$	
AIC 181 11 180 10 105 52 155 43	
BIC 124.65 124.67 126.69 124.53 Oracle: 118.	.96
CV.1se 110.36 110.39 110.40 108.74 110.39	
CV.min 109.04 110.34 110.47 113.45 109.10 $\operatorname{sd}(\mu)/\sigma = 0$	0.5
AICc 108.53 112.85 113.18 110.60 $\rho = 0$	
AIC 160.43 167.20 173.04 138.30	
BIC 110.38 110.39 110.77 110.31 Oracle: 105.	.41
CV.1se 103.91 103.92 103.92 102.63 103.92	
CV.min 102.75 103.86 103.98 106.77 102.85 $sd(\mu)/\sigma = 0$	0.5
AICc 102.27 106.26 106.53 104.36 $\rho = 0$	
AIC 150.74 157.20 162.82 129.44	
BIC 103.90 103.92 104.37 103.84 Oracle: 99.	.15

Table 63: Estimation MSE for n=1000, continuous design, dense covariates, and decay 10.

	lasso			marginal AL		
CV.1se	1.38	1.35	1.31	1.32	1.28	
CV.min	1.30	1.28	1.25	1.27	1.24	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.30	1.28	1.27	1.27		$\rho = 0$
AIC	1.68	1.69	1.78	1.27		Oracle : 1.18
BIC	1.42	1.37	1.32	1.32		Oracle . 1.16
CV.1se	0.56	0.55	0.51	0.61	0.49	
CV.min	0.53	0.51	0.49	0.59	0.47	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.53	0.52	0.49	0.59		$\rho = 0.5$
AIC	0.61	0.61	0.63	0.59		Oracle : 0.45
BIC	0.64	0.60	0.54	0.61		Oracie : 0.43
CV.1se	0.16	0.15	0.14	0.17	0.14	
CV.min	0.15	0.15	0.14	0.17	0.13	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.15	0.15	0.14	0.17		$\rho = 0.9$
AIC	0.15	0.14	0.14	0.17		Oma ala . 0.12
BIC	0.20	0.19	0.17	0.17		Oracle: 0.12
CV.1se	5.39	5.29	5.15	5.00	5.10	
CV.min	5.08	5.01	4.95	5.13	4.94	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.08	5.02	5.06	5.08		$\rho = 0$
AIC	7.41	7.50	8.01	5.27		
BIC	5.41	5.32	5.32	5.09		Oracle: 4.70
CV.1se	2.19	2.12	2.01	2.08	1.94	
CV.min	2.04	1.99	1.92	2.07	1.88	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.04	1.99	1.94	2.06		$\rho = 0.5$
AIC	2.69	2.72	2.89	2.07		
BIC	2.34	2.25	2.12	2.23		Oracle: 1.77
CV.1se	0.64	0.61	0.56	0.54	0.54	
CV.min	0.58	0.57	0.54	0.52	0.53	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58	0.57	0.55	0.52		$\rho = 0.9$
AIC	0.61	0.61	0.65	0.52		,
BIC	0.69	0.68	0.68	0.54		Oracle: 0.48
CV.1se	20.93	20.70	20.51	19.70	20.35	
CV.min	19.78	19.65	19.69	20.92	19.64	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	19.76	19.76	20.60	20.41		$\rho = 0$
AIC	31.66	32.29	34.25	24.31		
BIC	20.61	20.65	21.70	19.92		<i>Oracle</i> : 18.68
CV.1se	8.31	8.18	8.01	7.93	7.74	
CV.min	7.81	7.71	7.65	8.19	7.48	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	7.78	7.73	7.97	8.10		$\rho = 0.5$
AIC	11.66	11.85	12.62	8.89		,
BIC	8.21	8.20	8.22	8.11		<i>Oracle</i> : 7.04
CV.1se	2.18	2.17	2.12	2.05	2.15	
CV.min	2.09	2.09	2.08	2.02	2.07	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	2.09	2.09	2.08	2.03		$\rho = 0.9$
AIC	2.66	2.74	3.05	2.03		
BIC	2.10	2.09	2.08	2.07		<i>Oracle</i> : 1.91

Table 64: Estimation MSE for n=1000, continuous design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	8.89	8.75	8.73	8.62	8.46	
CV.min	8.29	8.15	8.22	8.31	8.07	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.58	8.33	8.21	8.36		$\rho = 0$
AIC	10.11	10.26	10.96	8.32		<i>Oracle</i> : 7.12
BIC	11.38	10.69	10.16	9.86		07 actc . 7.12
CV.1se	3.36	3.26	3.14	3.80	3.02	
CV.min	3.10	3.02	2.95	3.53	2.89	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.36	3.18	2.92	3.60		$\rho = 0.5$
AIC	3.44	3.46	3.65	3.49		Oracle: 2.44
BIC	7.68	5.31	3.78	5.59		07 acte . 2.44
CV.1se	0.63	0.61	0.58	1.17	0.56	
CV.min	0.59	0.57	0.55	1.10	0.55	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.65	0.61	0.55	1.10		$\rho = 0.9$
AIC	0.59	0.57	0.56	1.10		Oracle: 0.44
BIC	1.67	1.66	1.65	1.25		Oracie : 0.44
CV.1se	34.06	33.85	34.98	31.42	32.94	
CV.min	31.34	31.26	32.68	31.51	31.30	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	31.83	31.40	33.52	31.27		$\rho = 0$
AIC	42.77	43.75	46.49	34.15		0 1 27 62
BIC	42.03	40.64	48.29	35.76		<i>Oracle</i> : 27.62
CV.1se	13.53	12.89	13.06	12.68	11.78	
CV.min	11.81	11.55	11.96	12.24	11.26	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.25	11.78	11.53	12.34		$\rho = 0.5$
AIC	14.53	14.78	15.67	12.45		0 1 0 15
BIC	16.62	16.65	16.79	16.24		<i>Oracle</i> : 9.45
CV.1se	2.91	2.78	2.71	2.50	2.29	
CV.min	2.64	2.45	2.48	2.35	2.15	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.67	2.67	2.62	2.35		$\rho = 0.9$
AIC	2.29	2.32	2.52	2.34		,
BIC	2.84	2.84	2.82	2.79		Oracle: 1.72
CV.1se	122.32	122.70	123.15	116.28	122.44	
CV.min	116.26	118.42	122.17	121.45	116.33	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	115.83	118.96	123.27	118.51		$\rho = 0$
AIC	177.17	182.78	191.21	146.86		
BIC	123.05	123.19	123.26	121.93		Oracle: 107.15
CV.1se	42.16	42.17	42.17	41.75	42.16	
CV.min	41.82	41.91	42.11	43.03	41.82	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	41.56	42.03	42.18	42.51		$\rho = 0.5$
AIC	60.25	61.81	64.90	50.74		
BIC	42.13	42.15	42.17	42.06		<i>Oracle</i> : 36.65
CV.1se	7.70	7.69	7.67	7.60	7.70	
CV.min	7.50	7.49	7.47	7.50	7.46	$sd(\mu)/\sigma = 0.5$
AICc	7.49	7.51	7.49	7.52		$\rho = 0.9$
AIC	9.77	10.11	11.15	7.60		,
BIC	7.53	7.54	7.54	7.48		<i>Oracle</i> : 6.68

Table 65: Estimation MSE for n=1000, continuous design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	19.75	19.76	20.62	19.85	19.04	
CV.min	18.30	18.24	19.12	18.83	18.2	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	19.91	19.17	18.81	19.30		$\rho = 0$
AIC	21.09	21.49	22.88	18.63		Oracle: 15.73
BIC	46.55	33.24	24.57	27.18		07 acic . 13.73
CV.1se	7.50	7.32	7.19	9.12	7.09	
CV.min	6.74	6.63	6.69	8.03	6.70	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.11	7.40	6.65	8.66		$\rho = 0.5$
AIC	7.16	7.24	7.62	7.58		<i>Oracle</i> : 5.31
BIC	20.78	20.81	17.61	20.27		Oracie . 3.31
CV.1se	1.32	1.28	1.23	2.70	1.26	
CV.min	1.18	1.16	1.15	2.39	1.19	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.51	1.32	1.16	2.40		$\rho = 0.9$
AIC	1.18	1.14	1.15	2.36		Oracle: 0.90
BIC	3.33	3.33	3.31	3.28		Oracie: 0.90
CV.1se	75.68	78.22	89.56	69.05	73.29	
CV.min	67.78	69.59	80.16	68.33	67.80	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	70.19	69.24	77.65	68.32		$\rho = 0$
AIC	87.75	90.22	95.25	73.65		
BIC	98.91	98.92	99.42	91.76		<i>Oracle</i> : 59.71
CV.1se	32.61	32.35	33.50	27.99	31.66	
CV.min	27.83	28.32	32.85	26.47	27.79	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	28.71	27.60	27.00	27.01		$\rho = 0.5$
AIC	29.61	30.23	31.88	26.46		0 1 2016
BIC	33.51	33.54	33.58	33.30		<i>Oracle</i> : 20.16
CV.1se	5.69	5.68	5.64	5.37	5.66	
CV.min	5.46	5.44	5.46	4.96	5.37	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.41	5.49	5.47	4.92		$\rho = 0.9$
AIC	4.51	4.59	5.00	4.75		,
BIC	5.51	5.51	5.48	5.47		<i>Oracle</i> : 3.43
CV.1se	248.48	248.75	248.83	240.83	248.64	
CV.min	241.25	246.89	248.80	251.00	241.20	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	239.87	247.57	248.98	244.78		$\rho = 0$
AIC	359.81	373.33	388.16	305.32		225.74
BIC	248.75	248.83	260.38	248.16		Oracle: 225.74
CV.1se	84.04	84.04	84.04	83.70	84.04	
CV.min	83.75	83.95	84.07	86.35	83.78	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	83.45	84.01	84.08	85.29		$\rho = 0.5$
AIC	120.66	124.51	130.20	103.48		,
BIC	84.03	84.04	84.04	83.99		<i>Oracle</i> : 76.23
CV.1se	14.33	14.33	14.33	14.29	14.34	
CV.min	14.17	14.16	14.17	14.21	14.15	$sd(\mu)/\sigma = 0.5$
AICc	14.13	14.20	14.25	14.25		$\rho = 0.9$
AIC	18.82	19.62	21.33	14.53		,
BIC	14.23	14.25	14.31	14.17		Oracle : 12.97

Table 66: Estimation MSE for n=1000, continuous design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	44.42	46.71	56.79	46.06	42.76	
CV.min	40.06	41.17	46.59	42.63	39.87	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	49.74	45.58	43.24	45.76		$\rho = 0$
AIC	43.49	44.52	47.03	41.20		Oracle : 36.05
BIC	124.28	124.46	72.81	114.38		Oracie: 30.03
CV.1se	20.11	21.43	39.27	23.34	19.23	
CV.min	15.20	15.65	34.29	19.50	15.17	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	26.86	19.33	15.30	22.13		$\rho = 0.5$
AIC	14.76	14.97	15.68	16.30		Omasla . 12.00
BIC	41.76	41.80	41.06	41.46		Oracle: 12.09
CV.1se	5.61	5.64	6.78	6.32	6.14	
CV.min	4.01	4.16	6.49	5.32	4.91	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.40	6.11	2.57	5.28		$\rho = 0.9$
AIC	2.40	2.37	2.43	4.53		O11-00
BIC	6.66	6.66	6.64	6.60		Oracle: 1.98
CV.1se	169.30	187.88	199.29	149.02	165.35	
CV.min	145.46	163.65	195.22	145.76	145.47	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	155.35	149.68	176.34	147.26		$\rho = 0$
AIC	178.00	184.00	193.01	154.99		,
BIC	199.52	199.72	199.19	197.28		Oracle: 131.43
CV.1se	66.93	67.00	67.02	59.80	66.97	
CV.min	64.04	65.70	66.87	55.90	63.97	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	63.18	65.26	63.30	57.33		$\rho = 0.5$
AIC	59.68	61.25	64.28	54.73		
BIC	66.99	67.02	67.02	66.86		Oracle: 44.09
CV.1se	11.00	11.00	10.99	10.89	11.01	
CV.min	10.74	10.74	10.76	10.35	10.73	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.65	10.82	10.84	10.27		$\rho = 0.9$
AIC	9.05	9.31	10.04	9.44		
BIC	10.86	10.87	10.92	10.78		Oracle: 7.22
CV.1se	499.75	499.92	499.94	490.79	499.87	
CV.min	491.34	499.45	500.31	511.49	491.87	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	488.97	501.61	499.93	498.68		$\rho = 0$
AIC	725.13	757.08	782.66	623.41		·
BIC	499.85	499.93	702.82	499.40		Oracle: 476.83
CV.1se	167.73	167.73	167.73	167.37	167.73	
CV.min	167.35	167.70	167.82	172.56	167.40	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	166.89	167.74	167.73	170.57		$\rho = 0.5$
AIC	241.13	250.55	260.98	208.44		1 150.04
BIC	167.72	167.73	169.58	167.68		Oracle: 159.94
CV.1se	27.55	27.55	27.55	27.53	27.55	
CV.min	27.44	27.45	27.50	27.54	27.44	$sd(\mu)/\sigma = 0.5$
AICc	27.39	27.50	27.54	27.60		$\rho = 0.9$
AIC	36.95	38.80	41.67	28.31		·
BIC	27.52	27.53	27.55	27.47		Oracle: 26.20

Table 67: Estimation MSE for n=1000, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	0.34	0.34	0.33	0.33	0.32	
CV.min	0.32	0.32	0.31	0.32	0.31	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.32	0.32	0.31	0.32		$\rho = 0$
AIC	0.42	0.42	0.45	0.32		Oracle : 0.31
BIC	0.35	0.34	0.32	0.33		074666.0.51
CV.1se	0.31	0.30	0.29	0.30	0.29	
CV.min	0.29	0.29	0.28	0.29	0.28	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.29	0.29	0.28	0.29		$\rho = 0.5$
AIC	0.37	0.38	0.40	0.29		Oracle: 0.28
BIC	0.32	0.31	0.29	0.30		Oracie : 0.28
CV.1se	0.29	0.29	0.28	0.28	0.27	
CV.min	0.28	0.27	0.26	0.27	0.26	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.28	0.27	0.26	0.27		$\rho = 0.9$
AIC	0.35	0.35	0.37	0.27		0
BIC	0.30	0.29	0.27	0.28		Oracle: 0.26
CV.1se	1.34	1.32	1.29	1.25	1.27	
CV.min	1.26	1.25	1.23	1.28	1.23	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.26	1.25	1.27	1.27		$\rho = 0$
AIC	1.85	1.87	2.00	1.31		·
BIC	1.35	1.31	1.29	1.27		Oracle: 1.24
CV.1se	1.21	1.18	1.15	1.12	1.13	
CV.min	1.14	1.12	1.1	1.15	1.1	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.14	1.12	1.13	1.14		$\rho = 0.5$
AIC	1.65	1.67	1.78	1.18		
BIC	1.22	1.18	1.15	1.14		Oracle: 1.11
CV.1se	1.14	1.12	1.09	1.06	1.07	
CV.min	1.08	1.06	1.04	1.08	1.04	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	1.08	1.06	1.07	1.08	200	$\rho = 0.9$
AIC	1.55	1.57	1.68	1.11		
BIC	1.16	1.12	1.09	1.09		Oracle: 1.05
CV.1se	5.21	5.16	5.11	4.90	5.07	
CV.13C	4.93	4.89	4.90	5.20	4.89	$sd(\mu)/\sigma = 0.5$
AICc	4.92	4.89	5.17	5.08	1.07	$\rho = 0$
AIC	7.90	8.06	8.55	6.07		·
BIC	5.14	5.09	5.21	4.96		Oracle: 4.98
CV.1se	4.68	4.62	4.56	4.39	4.53	
CV.13C	4.42	4.38	4.38	4.67	4.37	$sd(\mu)/\sigma = 0.5$
AICc	4.41	4.38	4.62	4.55	4. 37	$\rho = 0.5$
AIC	7.06	7.19	7.62	5.44		
BIC	4.62	4.57	4.64	4.46		Oracle: 4.44
CV.1se	4.62	4.37	4.04	4.40	4.28	
CV.1se CV.min	4.43			4.17	4.28 4.13	$sd(\mu)/\sigma = 0.5$
		4.15	4.16		4.13	
AICc	4.18	4.15	4.38	4.31		$\rho = 0.9$
AIC	6.65	6.78	7.20	5.08		Oracle: 4.20
BIC	4.39	4.34	4.40	4.23		

Table 68: Estimation MSE for n=1000, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL		
CV.1se	2.11	2.06	2.02	2.04	1.97	
CV.min	1.98	1.93	1.91	1.97	1.89	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	2.03	1.95	1.93	1.98		$\rho = 0$
AIC	2.47	2.50	2.68	1.98		Oracle : 1.66
BIC	2.59	2.38	2.18	2.29		07acic . 1.00
CV.1se	1.90	1.85	1.81	1.85	1.76	
CV.min	1.78	1.73	1.71	1.78	1.69	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.83	1.76	1.71	1.79		$\rho = 0.5$
AIC	2.20	2.23	2.38	1.79		Oracle : 1.47
BIC	2.40	2.19	1.95	2.12		Oracle . 1.47
CV.1se	1.79	1.74	1.70	1.76	1.65	
CV.min	1.68	1.64	1.61	1.69	1.59	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.73	1.66	1.62	1.70		$\rho = 0.9$
AIC	2.07	2.09	2.23	1.69		Oracle : 1.38
BIC	2.28	2.08	1.84	2.02		Oracie : 1.38
CV.1se	8.24	8.17	8.39	7.62	7.95	
CV.min	7.60	7.57	7.86	7.64	7.58	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.69	7.54	8.30	7.58		$\rho = 0$
AIC	10.46	10.70	11.38	8.30		
BIC	10.06	9.29	10.18	8.59		<i>Oracle</i> : 6.62
CV.1se	7.42	7.33	7.47	6.86	7.11	
CV.min	6.82	6.77	6.99	6.87	6.78	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.92	6.76	7.35	6.82		$\rho = 0.5$
AIC	9.31	9.51	10.10	7.46		
BIC	9.38	8.53	9.14	7.86		<i>Oracle</i> : 5.88
CV.1se	6.99	6.92	7.11	6.51	6.71	
CV.min	6.44	6.39	6.65	6.49	6.40	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.54	6.38	6.88	6.46		$\rho = 0.9$
AIC	8.75	8.94	9.50	7.00		
BIC	8.98	8.13	8.69	7.50		<i>Oracle</i> : 5.54
CV.1se	29.81	29.91	30.03	28.31	29.84	
CV.min	28.31	28.88	29.78	29.60	28.34	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	28.2	28.41	31.56	28.90		$\rho = 0$
AIC	43.35	44.71	46.79	35.84		
BIC	30.01	29.97	30.07	29.69		<i>Oracle</i> : 26.48
CV.1se	26.57	26.62	26.70	25.36	26.60	
CV.min	25.38	25.82	26.53	26.50	25.42	$sd(\mu)/\sigma = 0.5$
AICc	25.25	25.38	28.50	25.87		$\rho = 0.5$
AIC	38.55	39.72	41.54	32.20		
BIC	26.68	26.67	26.72	26.49		Oracle: 23.53
CV.1se	25.05	25.11	25.16	23.99	25.10	
CV.nsc	23.95	24.36	25.01	24.95	23.99	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	23.85	23.94	26.63	24.43	_2.,,,	$\rho = 0.9$
AIC	36.24	37.35	39.09	30.06		
BIC	25.15	25.13	25.18	24.98		<i>Oracle</i> : 22.16
	23.13	43.13	23.10	۷٦،۶۵		

Table 69: Estimation MSE for n=1000, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL		
CV.1se	3.76	3.61	3.36	3.65	3.30	
CV.min	3.56	3.43	3.26	3.53	3.26	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.67	3.47	3.35	3.55		$\rho = 0$
AIC	4.47	4.55	4.87	3.57		Oracle: 2.94
BIC	4.59	4.06	3.62	4.07		074666.2.54
CV.1se	3.38	3.23	2.98	3.31	2.91	
CV.min	3.20	3.08	2.90	3.20	2.88	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.30	3.11	2.98	3.23		$\rho = 0.5$
AIC	3.98	4.05	4.32	3.23		Oracle : 2.61
BIC	4.23	3.69	3.20	3.78		Oracle . 2.01
CV.1se	3.18	3.04	2.83	3.16	2.76	
CV.min	3.02	2.91	2.75	3.04	2.72	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.12	2.94	2.81	3.07		$\rho = 0.9$
AIC	3.74	3.81	4.07	3.06		Oracle : 2.46
BIC	4.04	3.51	3.04	3.63		Oracie : 2.40
CV.1se	15.29	15.35	16.83	14.13	14.78	
CV.min	13.96	14.04	15.26	14.06	13.95	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	14.24	13.96	15.45	14.00		$\rho = 0$
AIC	18.83	19.34	20.48	15.33		
BIC	21.17	19.98	21.18	17.90		<i>Oracle</i> : 11.78
CV.1se	13.82	13.84	15.21	12.77	13.33	
CV.min	12.54	12.58	13.66	12.68	12.53	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.85	12.52	13.71	12.65		$\rho = 0.5$
AIC	16.74	17.18	18.16	13.77		
BIC	18.86	18.33	18.89	16.72		<i>Oracle</i> : 10.46
CV.1se	13.02	13.04	14.46	12.13	12.59	
CV.min	11.84	11.86	13.02	12.00	11.83	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.15	11.82	12.94	11.98		$\rho = 0.9$
AIC	15.75	16.16	17.10	12.95		
BIC	17.80	17.37	17.79	16.04		<i>Oracle</i> : 9.86
CV.1se	53.36	53.48	53.51	51.35	53.41	
CV.min	51.39	52.79	53.45	53.56	51.43	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	51.14	52.09	55.86	52.29		$\rho = 0$
AIC	77.50	80.32	83.64	65.12		
BIC	53.49	53.50	53.52	53.31		<i>Oracle</i> : 47.14
CV.1se	47.42	47.49	47.51	45.88	47.46	
CV.min	46.02	46.99	47.48	47.86	46.06	$sd(\mu)/\sigma = 0.5$
AICc	45.75	46.41	50.02	46.73		$\rho = 0.5$
AIC	68.81	71.22	74.17	58.32		
BIC	47.49	47.49	47.51	47.37		<i>Oracle</i> : 41.82
CV.1se	44.74	44.79	44.80	43.44	44.78	
CV.13C	43.47	44.38	44.80	45.16	43.50	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	43.18	43.79	46.92	44.14	15.50	$\rho = 0.9$
AIC	64.73	67.04	69.87	54.55		
BIC	44.79	44.79	44.81	44.69		<i>Oracle</i> : 39.43
	77.13	77.13	77.01	77.02		

Table 70: Estimation MSE for n=1000, binary design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	5.50	5.19	4.63	5.29	4.56	
CV.min	5.24	4.99	4.60	5.13	4.55	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.39	5.03	4.76	5.16		$\rho = 0$
AIC	6.62	6.76	7.25	5.24		Oracle : 4.33
BIC	6.47	5.65	4.98	5.74		Oracle . 4.33
CV.1se	4.93	4.64	4.09	4.81	4.01	
CV.min	4.70	4.46	4.08	4.66	4	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.85	4.51	4.20	4.69		$\rho = 0.5$
AIC	5.89	6.00	6.43	4.73		<i>Oracle</i> : 3.84
BIC	5.94	5.10	4.38	5.31		Oracie : 5.64
CV.1se	4.65	4.38	3.88	4.59	3.81	
CV.min	4.44	4.22	3.88	4.43	3.78	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.59	4.26	3.97	4.46		$\rho = 0.9$
AIC	5.54	5.65	6.05	4.49		Oracle: 3.62
BIC	5.65	4.82	4.15	5.08		Oracie: 5.62
CV.1se	22.82	23.17	26.71	21.08	22.03	
CV.min	20.74	21.00	23.69	20.92	20.74	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	21.25	20.81	23.26	20.86		$\rho = 0$
AIC	27.81	28.66	30.26	22.86		·
BIC	31.33	30.68	31.31	28.86		<i>Oracle</i> : 17.32
CV.1se	20.66	20.93	24.44	19.07	19.93	
CV.min	18.64	18.82	21.57	18.87	18.64	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	19.17	18.65	20.58	18.86		$\rho = 0.5$
AIC	24.70	25.42	26.82	20.50		
BIC	27.83	27.60	27.86	26.46		<i>Oracle</i> : 15.36
CV.1se	19.48	19.76	23.30	18.14	18.83	
CV.min	17.62	17.78	20.53	17.88	17.61	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	18.13	17.63	19.45	17.89		$\rho = 0.9$
AIC	23.26	23.95	25.28	19.30		,
BIC	26.26	26.12	26.29	25.22		<i>Oracle</i> : 14.49
CV.1se	78.47	78.59	78.62	75.90	78.53	
CV.min	76.00	78.08	78.62	79.15	76.01	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	75.6	77.89	81.00	77.21		$\rho = 0$
AIC	114.01	118.59	123.13	96.44		,
BIC	78.59	78.61	78.62	78.42		<i>Oracle</i> : 69.25
CV.1se	69.71	69.78	69.79	67.79	69.75	
CV.min	68.02	69.44	69.81	70.68	68.07	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	67.61	69.22	72.36	68.97		$\rho = 0.5$
AIC	101.21	105.15	109.20	86.21		,
BIC	69.77	69.78	69.79	69.65		<i>Oracle</i> : 61.43
CV.1se	65.81	65.86	65.86	64.21	65.85	
CV.min	64.32	65.58	65.89	66.75	64.36	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	63.9	65.37	68.08	65.23		$\rho = 0.9$
AIC	95.28	99.04	102.94	80.65		
BIC	65.85	65.85	65.86	65.75		<i>Oracle</i> : 57.96
	05.05	05.05	05.00	05.15		

Table 71: Estimation MSE for n=1000, continuous design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL		
CV.1se	1.38	1.35	1.31	1.32	1.28	
CV.min	1.30	1.28	1.25	1.27	1.24	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.30	1.28	1.27	1.27		$\rho = 0$
AIC	1.68	1.69	1.79	1.27		Oracle : 1.25
BIC	1.42	1.37	1.32	1.32		07 acte : 1.23
CV.1se	0.56	0.55	0.51	0.61	0.49	
CV.min	0.53	0.51	0.49	0.59	0.47	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.53	0.52	0.49	0.59		$\rho = 0.5$
AIC	0.61	0.61	0.63	0.59		Oracle: 0.47
BIC	0.64	0.60	0.54	0.61		07acie . 0.47
CV.1se	0.16	0.15	0.14	0.17	0.14	
CV.min	0.15	0.15	0.14	0.17	0.13	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.15	0.15	0.14	0.17		$\rho = 0.9$
AIC	0.15	0.14	0.14	0.17		0
BIC	0.20	0.19	0.17	0.17		Oracle: 0.13
CV.1se	5.39	5.29	5.15	5.00	5.10	
CV.min	5.08	5.01	4.95	5.13	4.94	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.08	5.02	5.06	5.08		$\rho = 0$
AIC	7.41	7.50	8.01	5.27		,
BIC	5.42	5.32	5.32	5.09		Oracle: 4.99
CV.1se	2.19	2.12	2.01	2.08	1.94	
CV.min	2.04	1.99	1.92	2.07	1.88	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.04	1.99	1.94	2.06		$\rho = 0.5$
AIC	2.69	2.72	2.89	2.07		,
BIC	2.34	2.25	2.12	2.23		Oracle: 1.88
CV.1se	0.64	0.61	0.56	0.54	0.54	
CV.min	0.58	0.57	0.54	0.52	0.53	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58	0.57	0.55	0.52	0.00	$\rho = 0.9$
AIC	0.61	0.61	0.65	0.52		,
BIC	0.69	0.68	0.68	0.54		Oracle: 0.51
CV.1se	20.93	20.70	20.50	19.70	20.35	
CV.min	19.78	19.65	19.69	20.92	19.64	$sd(\mu)/\sigma = 0.5$
AICc	19.76	19.76	20.60	20.41	25.0.1	$\rho = 0$
AIC	31.66	32.29	34.25	24.31		,
BIC	20.61	20.65	21.70	19.91		<i>Oracle</i> : 19.97
CV.1se	8.31	8.18	8.01	7.93	7.74	
CV.rise CV.min	7.82	7.71	7.66	8.19	7.48	$sd(\mu)/\sigma = 0.5$
AICc	7.78	7.74	7.98	8.10	7.40	$\rho = 0.5$
AIC	11.66	11.85	12.62	8.89		,
BIC	8.22	8.21	8.22	8.12		Oracle: 7.53
CV.1se	2.18	2.17	2.12	2.05	2.15	
CV.1se CV.min	2.16	2.17	2.12	2.03	2.13	$sd(\mu)/\sigma = 0.5$
AICc	2.09	2.09	2.08	2.02	2.07	$\begin{array}{c c} \operatorname{sd}(\mu)/\delta = 0.3 \\ \rho = 0.9 \end{array}$
AICC	2.66	2.09	3.05	2.03		$\rho = 0.9$
		2.74				Oracle: 2.04
BIC	2.10	2.09	2.08	2.07		

Table 72: Estimation MSE for n=1000, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}~\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	8.47	8.27	8.11	8.19	7.90	
CV.min	7.94	7.76	7.67	7.92	7.61	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.15	7.88	7.74	7.95		$\rho = 0$
AIC	9.89	10.03	10.73	7.94		<i>Oracle</i> : 6.65
BIC	10.42	9.81	9.31	9.16		07 acre . 0.03
CV.1se	3.20	3.09	2.93	3.63	2.81	
CV.min	2.98	2.89	2.78	3.38	2.71	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	3.18	3.01	2.76	3.44		$\rho = 0.5$
AIC	3.35	3.38	3.57	3.36		Oracle: 2.28
BIC	6.83	4.77	3.50	5.19		07466 . 2.20
CV.1se	0.61	0.59	0.55	1.14	0.53	
CV.min	0.57	0.55	0.53	1.08	0.52	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.62	0.58	0.53	1.08		$\rho = 0.9$
AIC	0.57	0.55	0.54	1.08		Oracle: 0.42
BIC	1.64	1.64	1.59	1.21		07466 . 0.42
CV.1se	33.07	32.79	33.77	30.55	31.94	
CV.min	30.50	30.37	31.59	30.66	30.41	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	30.93	30.49	32.44	30.41		$\rho = 0$
AIC	41.93	42.89	45.60	33.25		Oracle : 26.59
BIC	40.50	39.02	47.09	34.53		Oracie . 20.39
CV.1se	13.10	12.48	12.58	12.37	11.41	
CV.min	11.51	11.24	11.59	11.95	10.93	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.92	11.46	11.22	12.03		$\rho = 0.5$
AIC	14.26	14.50	15.38	12.16		Oracle : 9.11
BIC	16.31	16.34	16.49	15.92		07466. 9.11
CV.1se	2.86	2.70	2.63	2.46	2.21	
CV.min	2.56	2.37	2.38	2.31	2.09	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	2.60	2.59	2.53	2.31		$\rho = 0.9$
AIC	2.26	2.28	2.48	2.30		Oracle : 1.68
BIC	2.80	2.80	2.78	2.75		Oracie . 1.06
CV.1se	119.93	120.31	120.82	113.86	120.03	
CV.min	113.81	115.93	119.70	118.93	113.89	$sd(\mu)/\sigma = 0.5$
AICc	113.42	116.46	120.93	116.06		$\rho = 0$
AIC	173.78	179.27	187.58	144.00		Oracle: 106.35
BIC	120.69	120.84	120.92	119.52		Oracie . 100.55
CV.1se	41.42	41.42	41.42	40.99	41.42	
CV.min	41.07	41.14	41.36	42.25	41.06	$sd(\mu)/\sigma = 0.5$
AICc	40.82	41.28	41.44	41.71		$\rho = 0.5$
AIC	59.16	60.69	63.73	49.77		Oracle: 36.43
BIC	41.38	41.40	41.42	41.31		07466.30.43
CV.1se	7.60	7.59	7.57	7.50	7.60	
CV.min	7.40	7.39	7.37	7.40	7.36	$sd(\mu)/\sigma = 0.5$
AICc	7.39	7.41	7.39	7.42		$\rho = 0.9$
AIC	9.64	9.97	11.00	7.50		Oracle : 6.70
BIC	7.43	7.44	7.43	7.38		Oracie . 0.70

Table 73: Estimation MSE for n=1000, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	*	
CV.1se	15.10	14.47	13.52	14.64	13.24	
CV.min	14.30	13.80	13.11	14.18	13.12	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	14.72	14.01	13.45	14.25		$\rho = 0$
AIC	17.93	18.24	19.55	14.33		Oracle: 11.82
BIC	18.30	16.69	14.97	16.28		07 acic . 11.02
CV.1se	5.57	5.26	4.71	6.67	4.41	
CV.min	5.32	5.06	4.65	6.10	4.39	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.67	5.23	4.64	6.35		$\rho = 0.5$
AIC	6.07	6.12	6.49	5.98		Oracle: 4.01
BIC	17.96	17.51	5.13	16.69		07 acte . 4.01
CV.1se	1.01	0.96	0.86	2.24	0.82	
CV.min	0.97	0.92	0.85	2.01	0.81	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.06	0.97	0.85	2.02		$\rho = 0.9$
AIC	0.96	0.93	0.94	2.01		Omasla : 0.70
BIC	2.91	2.92	2.88	2.82		Oracle: 0.70
CV.1se	61.30	61.63	67.80	56.69	59.40	
CV.min	56.03	56.36	61.20	56.45	56.05	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	57.25	56.51	61.22	56.21		$\rho = 0$
AIC	75.47	77.53	82.05	61.51		·
BIC	85.09	84.04	85.85	71.78		Oracle: 47.30
CV.1se	26.22	25.20	28.27	23.25	23.48	
CV.min	21.83	21.47	26.06	22.17	21.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	22.98	21.55	21.26	22.50		$\rho = 0.5$
AIC	25.54	26.06	27.54	22.37		
BIC	29.05	29.08	29.14	28.80		<i>Oracle</i> : 16.04
CV.1se	5.02	4.99	4.96	4.61	4.79	
CV.min	4.76	4.68	4.79	4.25	4.36	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.74	4.81	4.76	4.23		$\rho = 0.9$
AIC	3.92	3.98	4.36	4.11		
BIC	4.86	4.86	4.83	4.81		Oracle: 2.80
CV.1se	214.42	214.86	215.02	206.23	214.59	
CV.min	206.43	212.06	214.78	214.96	206.33	$sd(\mu)/\sigma = 0.5$
AICc	205.31	212.39	215.21	209.69		$\rho = 0$
AIC	310.41	321.76	335.07	261.14		,
BIC	214.89	215.00	217.26	214.16		Oracle: 189.14
CV.1se	72.92	72.92	72.92	72.56	72.92	
CV.min	72.61	72.80	72.95	74.88	72.64	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	72.32	72.89	72.96	73.92	72.01	$\rho = 0.5$
AIC	104.61	107.80	112.84	89.35		
BIC	72.91	72.92	72.92	72.88		<i>Oracle</i> : 64.15
CV.1se	12.72	12.72	12.71	12.66	12.72	
CV.rise CV.min	12.53	12.53	12.53	12.57	12.72	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	12.55 12.5	12.58	12.60	12.60	12.31	$\rho = 0.9$
AIC	16.60	17.27	18.84	12.81		·
BIC	12.61	12.62	12.69	12.54		Oracle: 11.20
DIC	12.01	12.02	14.09	14.34		

Table 74: Estimation MSE for n=1000, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	22.06	20.83	18.60	21.21	18.31	
CV.min	21.02	20.04	18.49	20.59	18.26	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	21.63	20.28	19.18	20.69		$\rho = 0$
AIC	26.52	27.07	29.04	21.02		Oracle: 17.37
BIC	26.07	23.17	20.23	23.08		01466.11.31
CV.1se	8.07	7.45	6.44	9.77	6.03	
CV.min	7.79	7.30	6.54	8.91	6.04	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.27	7.47	6.47	9.35		$\rho = 0.5$
AIC	8.98	9.08	9.65	8.69		<i>Oracle</i> : 5.87
BIC	26.50	25.09	6.71	25.92		01466.3.61
CV.1se	1.44	1.33	1.17	3.34	1.09	
CV.min	1.39	1.31	1.18	2.88	1.10	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	1.51	1.35	1.16	2.90		$\rho = 0.9$
AIC	1.39	1.34	1.41	2.84		Oracle: 1.01
BIC	4.27	4.28	3.44	4.21		Oracie : 1.01
CV.1se	91.40	92.90	107.18	84.53	88.38	
CV.min	83.20	84.26	95.00	83.92	83.19	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	85.14	84.21	93.73	83.70		$\rho = 0$
AIC	111.39	114.82	121.21	91.72		0 1 (0.47
BIC	125.83	125.78	126.15	116.17		Oracle : 69.47
CV.1se	40.67	40.08	42.55	34.99	39.34	
CV.min	34.02	34.26	41.87	33.17	33.76	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	35.81	32.73	32.27	33.80		$\rho = 0.5$
AIC	37.63	38.50	40.63	33.23		0122.40
BIC	42.62	42.64	42.67	42.42		Oracle: 23.49
CV.1se	7.28	7.27	7.23	6.96	7.25	
CV.min	6.96	6.94	6.98	6.41	6.89	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.90	7.03	7.00	6.35		$\rho = 0.9$
AIC	5.77	5.89	6.45	5.97		01402
BIC	7.09	7.11	7.11	7.01		Oracle: 4.03
CV.1se	315.28	315.72	315.85	304.89	315.47	
CV.min	305.33	313.63	315.86	317.57	305.18	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	303.58	314.44	315.81	309.81		$\rho = 0$
AIC	456.70	475.12	493.35	386.66		Omasla . 277 99
BIC	315.72	315.81	351.65	314.97		Oracle : 277.88
CV.1se	106.78	106.79	106.78	106.40	106.79	
CV.min	106.43	106.70	106.84	109.83	106.46	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	106.08	106.77	106.79	108.39		$\rho = 0.5$
AIC	153.36	158.62	165.71	131.58		
BIC	106.77	106.78	106.79	106.75		<i>Oracle</i> : 93.96
CV.1se	18.33	18.33	18.32	18.28	18.33	
CV.min	18.14	18.15	18.20	18.18	18.14	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	18.1	18.22	18.29	18.23		$\rho = 0.9$
AIC	24.24	25.34	27.45	18.64		
BIC	18.25	18.28	18.32	18.18		<i>Oracle</i> : 16.13
						L

Table 75: Nonzero coefficients at n=100, binary design, dense covariates, and decay 10.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
AIC 20.3 15.31 49.62 26.53 $\rho = 0$ AIC 109.15 96.42 74.5 86.93 BIC 107.58 94.95 73.11 80.43 $\rho = 0$ CV.lse 8.49 5.59 1.91 41.74 5.52 $\rho = 0.5$ AIC 110.09 97.3 75.5 88.14 $\rho = 0.5$ AIC 110.09 97.3 75.5 88.14 $\rho = 0.5$ AIC 110.36 95.99 74.14 83.13 $\rho = 0.5$ AIC 108.36 95.99 74.14 83.13 $\rho = 0.5$ CV.min 40.17 22.04 4.69 70.46 26.4 $\rho = 0.5$ AIC 109.97 97.37 75.89 88.06 $\rho = 0.9$ AIC 108.41 95.98 74.52 82.55 $\rho = 0.9$ AIC 108.41 95.98 74.52 82.55 $\rho = 0.9$ AIC 10.38 12.39 52.62 23.34 $\rho = 0.9$ AIC 10.38 12.39 52.62 23.34 $\rho = 0.0$ AIC 112.87 97.64 75.83 93.21 $\rho = 0.0$ AIC 113.35 98.15 76.48 93.57 $\rho = 0.0$ AIC 113.09 98.35 74.6 92.26 $\rho = 0.0$ AIC 113.09 98.35 76.9 93.64 BIC 111.6 96.94 74.91 92.05 $\rho = 0.0$ AIC 113.09 98.35 76.9 93.64 BIC 111.6 96.94 74.91 92.05 $\rho = 0.0$ AIC 115.24 95.81 73.4 96.25 $\rho = 0.0$ AIC 115.25 96.35 74.18 96.43 BIC 114.03 94.19 71.41 95.64 $\rho = 0.0$ AIC 115.25 96.35 74.18 96.43 BIC 114.03 94.19 71.41 95.64 $\rho = 0.0$ Oracle : 14.05 CV.lie 0.29 0.1 0.03 48.6 0.5 $\rho = 0.0$ AIC 115.25 96.35 74.18 96.43 BIC 114.03 94.19 71.41 95.64 $\rho = 0.0$ Oracle : 7.82 AIC 5.61 26.75 54.85 21.48 $\rho = 0.0$ Oracle : 7.82 AIC 5.61 26.75 54.85 21.48 $\rho = 0.0$ Oracle : 7.82 AIC 115.14 96.36 74.23 96.08 $\rho = 0.0$ Oracle : 7.82 AIC 5.84 25.25 54.94 21.38 $\rho = 0.0$ AIC 115.14 96.36 74.23 96.08 $\rho = 0.0$ Oracle : 7.85 AIC 5.84 25.25 54.94 21.38 $\rho = 0.0$ AIC 115.14			6.8	2.15	40.73	7.02	
AIC 109.15 96.42 74.5 86.93 $Oracle: 21.25$ BIC 107.58 94.95 73.11 80.43 $Oracle: 21.25$ CV.lse 8.49 5.59 1.91 41.74 5.52 $Oracle: 21.25$ CV.min 41.33 23.91 5.15 72.56 28.29 $oracle: 20.95$ AIC 110.09 97.3 75.5 88.14 BIC 110.09 97.3 75.5 88.14 S1.3 $Oracle: 20.95$ CV.lse 7.83 5.05 1.68 40.55 5.59 $Oracle: 20.95$ AIC 109.97 97.37 75.89 88.06 $Oracle: 20.95$ AIC 109.97 97.37 75.89 88.06 $Oracle: 20.95$ AIC 109.97 97.37 75.89 88.06 $Oracle: 20.95$ AIC 108.41 95.98 74.52 82.55 $Oracle: 20.95$ AIC 108.41 95.98 74.52 82.55 $Oracle: 20.95$ AIC 10.841 95.98 74.52 82.55 $Oracle: 20.95$ AIC 10.38 12.39 52.62 23.34 $oracle: 20.95$ AIC 111.57 95.91 73.99 92.05 $Oracle: 20.95$ Oracle: 14.52 $Oracle: 20.95$ AIC 111.57 95.91 73.99 92.05 $Oracle: 20.95$ AIC 113.35 98.15 76.48 93.57 $oracle: 20.95$ AIC 113.35 98.15 76.48 93.57 $oracle: 20.95$ AIC 113.02 98.35 76.9 93.64 BIC 112.01 96.85 74.6 92.26 $oracle: 20.95$ AIC 113.02 98.35 76.9 93.64 BIC 111.09 98.85 76	CV.min			5.6		34.93	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 107.58 94.95 73.11 80.43 $Cracte: 21.25$ CV.1se 8.49 5.59 1.91 41.74 5.52 $CV.min$ 41.33 23.91 5.15 72.56 28.29 $sd(\mu)/\sigma = 2$ AICc 18.79 14.63 50.08 26.91 $\rho = 0.5$ AIC 110.09 97.3 75.5 88.14 $\rho = 0.5$ BIC 108.36 95.99 74.14 83.13 $\rho = 0.5$ CV.1se 7.83 5.05 1.68 40.55 5.59 $\rho = 0.9$ AIC 18.22 13.82 49.99 26.66 $\rho = 0.9$ AIC 109.97 97.37 75.89 88.06 $\rho = 0.9$ AIC 10.38 12.39 52.62 23.34 $\rho = 0.0$ AIC 112.87 97.64 75.83 93.21 $\rho = 0.0$ AIC 111.57 95.91 73.99 92.05 $\rho = 0.0$ AIC 112.87 97.64 75.83 93.21 $\rho = 0.0$ AIC 113.35 98.15 76.48 93.57 BIC 112.01 96.85 74.6 92.26 $\rho = 0.0$ AIC 113.35 98.15 76.48 93.57 BIC 112.01 96.85 74.6 92.26 $\rho = 0.0$ AIC 113.30 98.15 76.48 93.57 $\rho = 0.0$ AIC 113.02 98.35 76.9 93.64 $\rho = 0.0$ AIC 115.24 95.81 73.4 96.25 $\rho = 0.0$ AIC 115.25 96.35 74.8 96.25 $\rho = 0.0$ AIC 115.25 96.35 74.18 96.43 BIC 114.03 94.19 71.41 95.64 $\rho = 0.0$ AIC 115.25 96.35 74.18 96.43 BIC 114.03 94.19 71.41 95.64 $\rho = 0.0$ AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 $\rho = 0.5$ AIC 15.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 $\rho = 0.5$ AIC 15.24 95.81 74.18 96.43 $\rho = 0.0$ AIC 115.14 96.36 74.23 96.08 $\rho = 0.0$ AIC 115.14 96.36 74.23 96.08 $\rho = 0.0$							$\rho = 0$
Signature Si		109.15					Oracle · 21 25
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC				80.43		Oracic . 21.23
AICc 18.79 14.63 50.08 26.91 $\rho = 0.5$ AIC 110.09 97.3 75.5 88.14 $\rho = 0.5$ Dracle : 20.95 $\rho = 0.9$ Dracle : 20.95 $\rho = 0.9$ Dracle : 20.97 Dra		8.49	5.59	1.91	41.74	5.52	
AIC 110.09 97.3 75.5 88.14 $Oracle: 20.95$ BIC 108.36 95.99 74.14 83.13 $Oracle: 20.95$ CV.lse 7.83 5.05 1.68 40.55 5.59 $Olderightarrow$ AlC 17 22.04 4.69 70.46 26.4 $olderightarrow$ AIC 109.97 97.37 75.89 88.06 BIC 108.41 95.98 74.52 82.55 $Olderightarrow$ CV.lse 1.81 0.77 0.25 45.13 1.53 $Olderightarrow$ CV.lse 1.81 0.77 0.25 45.13 1.53 $olderightarrow$ CV.lse 1.81 0.77 0.25 45.13 1.53 $olderightarrow$ AIC 112.87 97.64 75.83 93.21 $olderightarrow$ AIC 112.87 97.64 75.83 93.21 $olderightarrow$ AIC 111.57 95.91 73.99 92.05 $olderightarrow$ AIC 113.35 98.15 76.48 93.57 $olderightarrow$ AIC 113.35 98.15 76.48 93.57 $olderightarrow$ AIC 113.35 98.15 76.48 93.57 $olderightarrow$ AIC 113.02 98.35 76.9 93.64 $olderightarrow$ AIC 115.24 95.81 73.4 96.25 $olderightarrow$ AIC 115.24 95.81 73.4 96.25 $olderightarrow$ AIC 115.24 95.81 73.4 96.25 $olderightarrow$ AIC 115.25 96.35 74.18 96.45 $olderightarrow$ AIC 115.26 96.35 74.18 96.45 $olderightarrow$ AIC 115	CV.min					28.29	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 108.36 95.99 74.14 83.13 Oracle: 20.95 CV.Ise 7.83 5.05 1.68 40.55 5.59 CV.min 40.17 22.04 4.69 70.46 26.4 sd(μ)/σ = 2 AIC 18.22 13.82 49.99 26.66 $\rho = 0.9$ AIC 109.97 97.37 75.89 88.06 $\rho = 0.9$ BIC 108.41 95.98 74.52 82.55 Oracle: 20.71 CV.Ise 1.81 0.77 0.25 45.13 1.53 CV.min 19.6 6.41 1.06 78.51 17.37 sd(μ)/σ = 1 AIC 112.87 97.64 75.83 93.21 Oracle: 14.52 CV.Ise 1.2 0.53 0.23 47.02 1.04 CV.Ise 1.2 0.53 0.23 47.02 1.04 CV.min 16.82 5.74 0.95 79.98 14.55 sd(μ)/σ = 0.5 AIC 113.35							$\rho = 0.5$
BIC 108.36 95.99 /4.14 83.13 CV.Isie 7.83 5.05 1.68 40.55 5.59 CV.min 40.17 22.04 4.69 70.46 26.4 sd(μ)/ σ = 2 AICc 18.22 13.82 49.99 26.66 ρ = 0.9 AIC 109.97 97.37 75.89 88.06 Oracle : 20.71 CV.Isie 1.81 0.77 0.25 45.13 1.53 CV.min 19.6 6.41 1.06 78.51 17.37 sd(μ)/ σ = 1 AIC 10.38 12.39 52.62 23.34 ρ = 0 AIC 112.87 97.64 75.83 93.21 Oracle : 14.52 CV.lise 1.2 0.53 0.23 47.02 1.04 CV.min 16.82 5.74 0.95 79.98 14.55 sd(μ)/ σ = 1 AIC 113.35 98.15 76.48 93.57 Oracle : 14.39 CV.lise 1.36 <td< td=""><td>AIC</td><td>110.09</td><td>97.3</td><td>75.5</td><td>88.14</td><td></td><td>Oracle : 20.05</td></td<>	AIC	110.09	97.3	75.5	88.14		Oracle : 20.05
$\begin{array}{c} \text{CV.min} & 40.17 & 22.04 & 4.69 & 70.46 & 26.4 & \mathrm{sd}(\mu)/\sigma = 2\\ \text{AICc} & 18.22 & 13.82 & 49.99 & 26.66 & \rho = 0.9\\ \text{AIC} & 109.97 & 97.37 & 75.89 & 88.06 & Oracle : 20.71\\ \text{BIC} & 108.41 & 95.98 & 74.52 & 82.55 & Oracle : 20.71\\ \hline \text{CV.lse} & 1.81 & 0.77 & 0.25 & 45.13 & 1.53\\ \text{CV.min} & 19.6 & 6.41 & 1.06 & 78.51 & 17.37 & \mathrm{sd}(\mu)/\sigma = 1\\ \text{AICc} & 10.38 & 12.39 & 52.62 & 23.34 & \rho = 0\\ \text{AIC} & 112.87 & 97.64 & 75.83 & 93.21\\ \text{BIC} & 111.57 & 95.91 & 73.99 & 92.05\\ \hline \text{CV.lise} & 1.2 & 0.53 & 0.23 & 47.02 & 1.04\\ \text{CV.min} & 16.82 & 5.74 & 0.95 & 79.98 & 14.55 & \mathrm{sd}(\mu)/\sigma = 1\\ \text{AICc} & 10.03 & 10.77 & 52.56 & 23.15 & \rho = 0.5\\ \text{AIC} & 113.35 & 98.15 & 76.48 & 93.57\\ \text{BIC} & 112.01 & 96.85 & 74.6 & 92.26\\ \hline \text{CV.lise} & 1.36 & 0.77 & 0.26 & 44.47 & 1.26\\ \text{CV.min} & 16.81 & 6.04 & 1.02 & 77.34 & 14.41 & \mathrm{sd}(\mu)/\sigma = 1\\ \text{AICc} & 9.84 & 9.51 & 51.91 & 23.51 & \rho = 0.9\\ \text{AIC} & 113.02 & 98.35 & 76.9 & 93.64\\ \text{BIC} & 111.6 & 96.94 & 74.91 & 92.05\\ \hline \text{CV.lise} & 0.27 & 0.05 & 0.02 & 48.27 & 0.55\\ \text{AIC} & 115.24 & 95.81 & 73.4 & 96.25\\ \text{BIC} & 114.03 & 94.19 & 71.41 & 95.64\\ \hline \text{CV.lise} & 0.29 & 0.1 & 0.03 & 48.6\\ \text{CV.lis} & 0.29 & 0.1 & 0.03 & 48.6\\ \text{CV.lis} & 0.29 & 0.1 & 0.03 & 48.6\\ \text{CV.lis} & 0.38 & 0.1 & 0.04 & 46.61\\ $							Oracic . 20.73
AICc 18.22 13.82 49.99 26.66 $\rho = 0.9$ AIC 109.97 97.37 75.89 88.06 $\rho = 0.9$ BIC 108.41 95.98 74.52 82.55 $\rho = 0.9$ AIC 108.41 95.98 74.52 82.55 $\rho = 0.9$ AIC 1.81 0.77 0.25 45.13 1.53 $\rho = 0.9$ AIC 1.81 0.77 0.25 45.13 1.53 $\rho = 0.9$ AIC 1.82 1.83 12.39 52.62 23.34 $\rho = 0.9$ AIC 1.12.87 97.64 75.83 93.21 $\rho = 0.9$ AIC 1.12.87 97.64 75.83 93.21 $\rho = 0.9$ AIC 1.12.87 95.91 73.99 92.05 $\rho = 0.9$ AIC 1.20 0.53 0.23 47.02 1.04 $\rho = 0.9$ AIC 1.21 0.25 5.74 0.95 79.98 14.55 $\rho = 0.5$ AIC 1.21 0.33 10.77 52.56 23.15 $\rho = 0.5$ AIC 1.335 98.15 76.48 93.57 $\rho = 0.5$ AIC 1.335 98.15 76.48 93.57 $\rho = 0.5$ AIC 1.36 0.77 0.26 44.47 1.26 $\rho = 0.5$ AIC 1.30 96.85 74.6 92.26 $\rho = 0.9$ AIC 1.30 98.35 76.9 93.64 $\rho = 0.9$ AIC 1.30 94.19 74.91 92.05 $\rho = 0.9$ AIC 1.524 95.81 73.4 96.25 $\rho = 0.9$ AIC 1.525 96.35 74.18 96.43 $\rho = 0.5$ AIC 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 1.525 96.35 74.18 96.43 $\rho = 0.5$ AIC 1.526 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 1.51.14 96.36 74.23 96.08 $\rho = 0.9$ AIC 1.51.14 96.36 74.23 96.08 $\rho = 0.9$ AIC 1.51.14 96.36 74.23 96.08	CV.1se	7.83	5.05	1.68	40.55	5.59	
AIC 109.97 97.37 75.89 88.06 BIC 108.41 95.98 74.52 82.55 $Oracle: 20.71$ CV.1se 1.81 0.77 0.25 45.13 1.53 $Oracle: 20.71$ AIC 10.38 12.39 52.62 23.34 $\rho=0$ 0.38 12.39 52.62 23.34 $\rho=0$ 0.38 BIC 111.57 95.91 73.99 92.05 $Oracle: 14.52$ CV.1se 1.2 0.53 0.23 47.02 1.04 $Oracle: 10.03$ 10.77 52.56 23.15 $Oracle: 14.52$ AIC 113.35 98.15 76.48 93.57 $Oracle: 14.39$ CV.1se 1.36 0.77 0.26 44.47 1.26 $Oracle: 14.39$ CV.1se 1.36 0.77 0.26 44.47 1.26 $Oracle: 14.39$ CV.1se 1.36 0.77 0.26 44.47 1.26 $Oracle: 14.39$ CV.1se 1.30 98.35 76.9 93.64 $Oracle: 14.05$ BIC 111.6 96.94 74.91 92.05 $Oracle: 14.05$ CV.1se 0.27 0.05 0.02 48.27 0.55 $Oracle: 14.05$ CV.1se 0.27 0.05 0.02 48.27 0.55 $Oracle: 14.05$ CV.1se 0.27 0.05 0.02 48.27 0.55 $Oracle: 14.05$ CV.1se 0.29 0.1 0.03 48.6 0.5 $Oracle: 1.20$ Oracle: 7.82 BIC 115.24 95.81 73.4 96.25 $Oracle: 1.20$ Oracle: 7.82 BIC 115.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.24 95.81 73.4 96.25 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.25 96.35 74.18 96.43 $Oracle: 1.20$ Oracle: 7.96 AIC 15.24 95.81 72.11 95.78 $Oracle: 1.20$ Oracle: 7.96 AIC 15.14 96.36 74.23 96.08	CV.min	40.17	22.04	4.69	70.46	26.4	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 108.41 95.98 74.52 82.55 $Oracle: 20.71$ CV.1se 1.81 0.77 0.25 45.13 1.53 $(\nabla V.)$ sin 19.6 6.41 1.06 78.51 17.37 $(\nabla V.)$ sin 19.6 78.51 17.37 $(\nabla V.)$ sin 19.6 112.87 97.64 75.83 93.21 $(\nabla V.)$ sin 112.87 97.64 75.83 93.21 $(\nabla V.)$ sin 11.57 95.91 73.99 92.05 $(\nabla V.)$ sin 16.82 5.74 0.95 79.98 14.55 $(\nabla V.)$ sin 16.81 98.15 76.48 93.57 $(\nabla V.)$ sin 16.81 6.04 1.02 77.34 14.41 $(\nabla V.)$ sin 16.81 6.04 74.91 92.05 $(\nabla V.)$ sin 11.6 96.94 74.91 92.05 $(\nabla V.)$ sin 7.44 1.22 0.23 81.9 7.52 $(\nabla V.)$ sin 7.44 1.25 0.23 81.9 7.52 $(\nabla V.)$ sin 7.44 1.27 0.05 0.00 48.27 0.55 $(\nabla V.)$ sin 7.44 1.27 0.03 48.6 0.5 $(\nabla V.)$ sin 7.44 1.29 0.23 81.9 7.52 $(\nabla V.)$ sin 7.44 1.29 0.23 81.9 7.52 $(\nabla V.)$ sin 7.44 1.25 0.23 81.9 7.52 $(\nabla V.)$ sin 7.44 1.27 0.28 81.9 7.52 $(\nabla V.)$ sin 7.44 1.29 0.23 81.9 7.52 $(\nabla V.)$ sin 7.44 1.29 0.25 83.11 73.4 96.25 $(\nabla V.)$ sin 7.44 1.95 83 $(\nabla V.)$ sin 7.54 95.81 73.4 96.25 $(\nabla V.)$ sin 7.52 $(\nabla V.)$ sin 7.54 1.74 95.64 $(\nabla V.)$ sin 7.55 $(\nabla V.)$ sin 7.59 1.24 0.25 80.87 7.52 $(\nabla V.)$ sin 7.57 $(\nabla V.)$ sin 7.59 1.24 0.25 80.87 7.52 $(\nabla V.)$ sin 7.57 $(\nabla V.)$ sin 7.59 1.24 0.25 80.87 7.52 $(\nabla V.)$ sin 7.57 $(\nabla V.)$ sin 7.59 1.24 0.25 80.87 7.52 $(\nabla V.)$ sin 7.57 $(\nabla V.)$	AICc	18.22	13.82	49.99	26.66		$\rho = 0.9$
BIC 108.41 95.98 $/4.52$ 82.55 CV.Ise 1.81 0.77 0.25 45.13 1.53 CV.min 19.6 6.41 1.06 78.51 17.37 $sd(\mu)/\sigma = 1$ AIC 10.38 12.39 52.62 23.34 $\rho = 0$ AIC 112.87 97.64 75.83 93.21 Oracle : 14.52 EV.1se 1.2 0.53 0.23 47.02 1.04 CV.min 16.82 5.74 0.95 79.98 14.55 $sd(\mu)/\sigma = 1$ AIC 113.35 98.15 76.48 93.57 Oracle : 14.39 CV.Ise 1.36 0.77 0.26 44.47 1.26 Oracle : 14.39 CV.Ise 1.36 0.77 0.26 44.47 1.26 Oracle : 14.39 CV.min 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AIC 113.02 98.35 76.9 93.64 Oracle : 14.05	AIC	109.97	97.37	75.89	88.06		Oracle : 20.71
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	108.41	95.98	74.52	82.55		Oracle . 20.71
AICc 10.38 12.39 52.62 23.34 $\rho = 0$ AIC 112.87 97.64 75.83 93.21 BIC 111.57 95.91 73.99 92.05 CV.1se 1.2 0.53 0.23 47.02 1.04 CV.min 16.82 5.74 0.95 79.98 14.55 $sd(\mu)/\sigma = 1$ AICc 10.03 10.77 52.56 23.15 $\rho = 0.5$ AIC 113.35 98.15 76.48 93.57 BIC 112.01 96.85 74.6 92.26 CV.1se 1.36 0.77 0.26 44.47 1.26 CV.min 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AICc 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 BIC 111.1.6 96.94 74.91 92.05 CV.1se 0.27 0.05 0.02 48.27 0.55 CV.min 7.44 1.22 0.23 81.9 7.52 $sd(\mu)/\sigma = 0.5$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.1se 0.29 0.1 0.04 46.61 0.51 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.1se 0.584 25.25 55.49 21.38 AIC 115.14 96.36 74.23 96.08	CV.1se	1.81	0.77	0.25	45.13	1.53	
AICc 10.38 12.39 52.62 23.34 $\rho = 0$ AIC 112.87 97.64 75.83 93.21 BIC 111.57 95.91 73.99 92.05 CV.1se 1.2 0.53 0.23 47.02 1.04 CV.min 16.82 5.74 0.95 79.98 14.55 $sd(\mu)/\sigma = 1$ AICc 10.03 10.77 52.56 23.15 $\rho = 0.5$ AIC 113.35 98.15 76.48 93.57 BIC 112.01 96.85 74.6 92.26 CV.1se 1.36 0.77 0.26 44.47 1.26 CV.min 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AICc 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 BIC 111.1.6 96.94 74.91 92.05 CV.1se 0.27 0.05 0.02 48.27 0.55 CV.min 7.44 1.22 0.23 81.9 7.52 $sd(\mu)/\sigma = 0.5$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.1se 0.29 0.1 0.04 46.61 0.51 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.1se 0.584 25.25 55.49 21.38 AIC 15.14 96.36 74.23 96.08	CV.min	19.6	6.41	1.06	78.51	17.37	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 111.57 95.91 73.99 92.05 $CV.1se$ 1.2 0.53 0.23 47.02 1.04 $CV.min$ 16.82 5.74 0.95 79.98 14.55 $sd(\mu)/\sigma = 1$ AICc 10.03 10.77 52.56 23.15 $\rho = 0.5$ AIC 113.35 98.15 76.48 93.57 $CV.1se$ 1.36 0.77 0.26 44.47 1.26 $CV.min$ 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AICc 113.02 98.35 76.9 93.64 $CV.1se$ 1.16 96.94 74.91 92.05 $CV.1se$ 0.27 0.05 0.02 48.27 0.55 $CV.1se$ 0.28 95.81 73.4 96.25 $CV.1se$ 0.29 0.1 0.03 48.6 0.5 $CV.1se$ 0.29 0.1 0.04 46.61 0.51 $CV.1se$ 0.38 0.1 0.04 0.25 80.87 7.52 $CV.1se$ 0.38 0.1 0.04 0.25 80.87 7.52 $CV.1se$ 0.38 0.1 0.04 0.25 80.87 7.52 $CV.1se$ 0.38 0.1 0.10 0.04 0.	AICc	10.38	12.39	52.62	23.34		
BIC 111.57 95.91 73.99 92.05 CV.Ise 1.2 0.53 0.23 47.02 1.04 CV.min 16.82 5.74 0.95 79.98 14.55 $sd(\mu)/\sigma = 1$ AIC 110.03 10.77 52.56 23.15 $\rho = 0.5$ AIC 113.35 98.15 76.48 93.57 Oracle: 14.39 CV.Ise 1.36 0.77 0.26 44.47 1.26 CV.min 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AICe 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 Oracle: 14.05 BIC 111.6 96.94 74.91 92.05 Oracle: 14.05 CV.Ise 0.27 0.05 0.02 48.27 0.55 CV.min 7.44 1.22 0.23 81.9 7.52 $sd(\mu)/\sigma = 0.5$ AICe 5.64 30.06	AIC	112.87	97.64	75.83	93.21		0114.52
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	111.57	95.91	73.99	92.05		Oracie: 14.52
AICc 10.03 10.77 52.56 23.15 $\rho = 0.5$ AIC 113.35 98.15 76.48 93.57 $\rho = 0.5$ Oracle : 14.39 $\rho = 0.5$ Dracle : 14.41 $\rho = 0.5$ Dracle : 14.41 $\rho = 0.5$ Dracle : 14.41 $\rho = 0.5$ Dracle : 14.45 $\rho = 0.5$ Dracle : 14.45 $\rho = 0.5$ Dracle : 14.05 Dracle : 14.05 $\rho = 0.5$ Dracle : 14.05 D	CV.1se	1.2	0.53	0.23	47.02	1.04	
AIC 113.35 98.15 76.48 93.57 $Oracle: 14.39$	CV.min	16.82	5.74	0.95	79.98	14.55	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 112.01 96.85 74.6 92.26 $Oracle: 14.39$ CV.1se 1.36 0.77 0.26 44.47 1.26 CV.min 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AICc 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 BIC 111.6 96.94 74.91 92.05 $Oracle: 14.05$ CV.1se 0.27 0.05 0.02 48.27 0.55 $O.02 = 0.05$ AICc 5.64 30.06 55.3 20.57 $O.02 = 0.05$ AIC 115.24 95.81 73.4 96.25 $O.02 = 0.05$ AIC 114.03 94.19 71.41 95.64 $O.02 = 0.02$ CV.1se 0.29 0.1 0.03 48.6 0.5 $O.02 = 0.02$ CV.min 7.52 1.27 0.26 83.11 7.38 $o.02 = 0.02$ AIC 115.25 96.35 74.18 96.43 $o.02 = 0.02$ AIC 115.25 96.35 74.18 96.43 $o.02 = 0.02$ AIC 113.81 94.91 72.11 95.78 $O.02 = 0.02$ AIC 113.81 94.91 72.11 95.78 $O.02 = 0.02$ AIC 113.81 94.91 72.11 95.78 $O.02 = 0.02$ AIC 115.14 96.36 74.23 96.08 $O.02 = 0.02$ AIC 115.14 96.36 74.23 96.08	AICc	10.03	10.77	52.56	23.15		$\rho = 0.5$
BIC 112.01 96.85 74.6 92.26 CV.1se 1.36 0.77 0.26 44.47 1.26 CV.min 16.81 6.04 1.02 77.34 14.41 $sd(\mu)/\sigma = 1$ AICc 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 Oracle: 14.05 BIC 111.6 96.94 74.91 92.05 Oracle: 14.05 CV.1se 0.27 0.05 0.02 48.27 0.55 CV.min 7.44 1.22 0.23 81.9 7.52 $sd(\mu)/\sigma = 0.5$ AIC 115.24 95.81 73.4 96.25 Oracle: 7.82 BIC 114.03 94.19 71.41 95.64 O.5 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AIC 115.25 96.35 74	AIC	113.35	98.15	76.48	93.57		Oma ala . 14 20
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	112.01	96.85	74.6	92.26		Oracie: 14.39
AICc 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 BIC 111.6 96.94 74.91 92.05 $\rho = 0.9$ CV.1se 0.27 0.05 0.02 48.27 0.55 $\rho = 0.5$ AICc 5.64 30.06 55.3 20.57 $\rho = 0$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 $\rho = 0.5$ CV.min 7.52 1.27 0.26 83.11 7.38 $\rho = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 $\rho = 0.5$ CV.1se 0.38 0.1 0.04 46.61 0.51 $\rho = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.1se	1.36	0.77	0.26	44.47	1.26	
AICc 9.84 9.51 51.91 23.51 $\rho = 0.9$ AIC 113.02 98.35 76.9 93.64 BIC 111.6 96.94 74.91 92.05 $\rho = 0.9$ CV.1se 0.27 0.05 0.02 48.27 0.55 $\rho = 0.5$ AICc 5.64 30.06 55.3 20.57 $\rho = 0$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 $\rho = 0.5$ CV.min 7.52 1.27 0.26 83.11 7.38 $\rho = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 $\rho = 0.5$ CV.1se 0.38 0.1 0.04 46.61 0.51 $\rho = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.min	16.81	6.04	1.02	77.34	14.41	$sd(\mu)/\sigma = 1$
BIC 111.6 96.94 74.91 92.05 Oracle: 14.05 CV.1se 0.27 0.05 0.02 48.27 0.55 CV.min 7.44 1.22 0.23 81.9 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.64 30.06 55.3 20.57 $\rho = 0$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AIC 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 $\rho = 0.5$ BIC 113.81 94.91 72.11 95.78 $\rho = 0.5$ CV.ise 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52	AICc	9.84	9.51	51.91	23.51		$\rho = 0.9$
BIC 111.6 96.94 74.91 92.05 CV.1se 0.27 0.05 0.02 48.27 0.55 CV.min 7.44 1.22 0.23 81.9 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.64 30.06 55.3 20.57 $\rho = 0$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AIC 5.84<	AIC	113.02	98.35	76.9	93.64		Oma ala . 14 05
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	111.6	96.94	74.91	92.05		Oracie: 14.03
AICc 5.64 30.06 55.3 20.57 $\rho = 0$ AIC 115.24 95.81 73.4 96.25 BIC 114.03 94.19 71.41 95.64 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.1se	0.27	0.05	0.02	48.27	0.55	
AIC 115.24 95.81 73.4 96.25 $Oracle: 7.82$ BIC 114.03 94.19 71.41 95.64 $Oracle: 7.82$ CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 $Oracle: 7.96$ BIC 113.81 94.91 72.11 95.78 $Oracle: 7.96$ CV.1se 0.38 0.1 0.04 46.61 0.51 $Oracle: 7.96$ CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.min	7.44	1.22	0.23	81.9	7.52	$sd(\mu)/\sigma = 0.5$
BIC 114.03 94.19 71.41 95.64 Oracle: 7.82 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 Oracle: 7.96 BIC 113.81 94.91 72.11 95.78 Oracle: 7.96 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	AICc	5.64	30.06	55.3	20.57		$\rho = 0$
BIC 114.03 94.19 71.41 95.64 CV.1se 0.29 0.1 0.03 48.6 0.5 CV.min 7.52 1.27 0.26 83.11 7.38 $sd(\mu)/\sigma = 0.5$ AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	AIC	115.24	95.81	73.4	96.25		Ongolo . 7.92
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	114.03	94.19	71.41	95.64		Oracie: 1.82
AICc 5.61 26.75 54.85 21.48 $\rho = 0.5$ AIC 115.25 96.35 74.18 96.43 $\rho = 0.5$ BIC 113.81 94.91 72.11 95.78 $\rho = 0.5$ CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $\rho = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.1se	0.29	0.1	0.03	48.6	0.5	
AIC 115.25 96.35 74.18 96.43 BIC 113.81 94.91 72.11 95.78 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.min	7.52	1.27	0.26	83.11	7.38	$sd(\mu)/\sigma = 0.5$
BIC 113.81 94.91 72.11 95.78 Oracle: 7.96 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08 Oracle: 7.57	AICc	5.61	26.75	54.85	21.48		$\rho = 0.5$
BIC 113.81 94.91 72.11 95.78 CV.1se 0.38 0.1 0.04 46.61 0.51 CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	AIC	115.25	96.35	74.18	96.43		Oma ala . 7.06
CV.min 7.59 1.24 0.25 80.87 7.52 $sd(\mu)/\sigma = 0.5$ AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	BIC	113.81	94.91	72.11	95.78		<i>Oracie</i> : 7.96
AICc 5.84 25.25 55.49 21.38 $\rho = 0.9$ AIC 115.14 96.36 74.23 96.08	CV.1se	0.38	0.1	0.04	46.61	0.51	
AIC 115.14 96.36 74.23 96.08	CV.min	7.59	1.24	0.25	80.87	7.52	$sd(\mu)/\sigma = 0.5$
1 Oracle : 151	AICc	5.84	25.25	55.49	21.38		$\rho = 0.9$
BIC 114 94.73 72.25 95.28	AIC	115.14	96.36	74.23	96.08		Oragla : 7.57
	BIC	114	94.73	72.25	95.28		Oracle: 1.51

Table 76: Nonzero coefficients at n=100, binary design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	1.34	0.2	0.07	53.16	1.06	
CV.min	17.15	2.34	0.45	85.15	18.97	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	8.05	37.06	55.48	22.98		$\rho = 0$
AIC	113.89	93.58	71.13	95.05		Oracle : 56.85
BIC	112.8	91.86	69.5	94.36		07466 . 30.03
CV.1se	0.63	0.18	0.06	51.6	0.71	
CV.min	15.5	2.1	0.36	84.16	15.71	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	7.89	35.41	55.16	23.4		$\rho = 0.5$
AIC	114.46	94.27	72.03	95.35		Oracle : 56.18
BIC	113.28	92.48	70.15	94.78		07acte . 30.16
CV.1se	0.84	0.24	0.05	49.94	0.74	
CV.min	14.96	1.93	0.37	82.39	13.87	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	7.28	33.16	55.39	22.38		$\rho = 0.9$
AIC	114.37	94.58	72.16	95.4		Oracle : 56.48
BIC	113.12	92.84	70.35	94.57		074666.30.40
CV.1se	0.53	0.06	0.03	50.93	0.68	
CV.min	10.62	1.05	0.24	84.51	9.83	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.39	42.84	56.81	22.2		$\rho = 0$
AIC	114.97	92.18	69.79	96.23		Oracle : 31.69
BIC	113.77	90.33	68.38	95.62		07466 . 31.07
CV.1se	0.27	0.05	0.03	48.97	0.54	
CV.min	9.01	0.9	0.19	84.28	8.51	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.15	42.39	56.52	22.08		$\rho = 0.5$
AIC	115.07	93.07	70.49	96.3		<i>Oracle</i> : 31.41
BIC	113.93	91.11	68.92	95.77		074666.31.41
CV.1se	0.42	0.06	0.04	48.42	0.53	
CV.min	9.6	0.98	0.26	81.83	9.33	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.76	41.57	56.68	21		$\rho = 0.9$
AIC	114.81	92.9	70.53	95.92		Oracle: 31
BIC	113.55	90.83	69.07	95.31		Oracle . 31
CV.1se	0.24	0.02	0.04	49.59	0.45	
CV.min	6.35	0.36	0.19	84.57	6.02	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.92	48.6	58.18	20.96		$\rho = 0$
AIC	115.61	88.57	66.96	96.64		Oracle : 8.54
BIC	114.23	86.37	66.14	96.13		074666.0.54
CV.1se	0.05	0.03	0.01	49.54	0.44	
CV.min	5.77	0.4	0.17	83.22	5.16	$sd(\mu)/\sigma = 0.5$
AICc	4.98	48.24	58.18	20.31		$\rho = 0.5$
AIC	115.49	89.44	67.61	96.86		Oracle : 8.87
BIC	114.27	87.47	66.68	96.26		01466.0.01
CV.1se	0.18	0.02	0.02	46.56	0.39	
CV.min	6.85	0.36	0.17	80.99	6.62	$sd(\mu)/\sigma = 0.5$
AICc	5.24	47.74	58.33	20.57		$\rho = 0.9$
AIC	115.34	89.16	67.7	96.66		Oracle : 8.11
BIC	114.07	86.87	66.81	96.04		0 / west . 0.11

Table 77: Nonzero coefficients at n=100, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	1.11	0.1	0.05	53.43	0.91	
CV.min	14.36	1	0.29	84.81	16.14	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.5	45.45	56.62	22.86		$\rho = 0$
AIC	114.51	90.73	68.48	95.75		<i>Oracle</i> : 78.12
BIC	113.45	88.83	67.4	95.12		07 acre : 70.12
CV.1se	0.56	0.1	0.04	52.87	0.6	
CV.min	12.21	0.9	0.26	85.13	11.88	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.6	44.09	56.53	22.42		$\rho = 0.5$
AIC	114.74	91.78	69.18	96.19		<i>Oracle</i> : 77.79
BIC	113.45	89.75	67.9	95.57		Oracic . 11.17
CV.1se	0.64	0.09	0.04	50.46	0.54	
CV.min	12.02	0.88	0.24	83.31	12.45	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.38	43.96	56.72	21.71		$\rho = 0.9$
AIC	114.76	91.76	69.19	95.71		Oracle : 77.15
BIC	113.53	89.77	67.95	95.1		Oracie . 11.13
CV.1se	0.41	0.05	0.02	51.4	0.57	
CV.min	9.65	0.48	0.2	84.61	9.83	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.79	47.88	57.85	21.65		$\rho = 0$
AIC	115.06	88.95	67.26	96.52		0129.01
BIC	113.92	86.81	66.33	95.9		<i>Oracle</i> : 38.01
CV.1se	0.34	0.05	0.03	49.83	0.46	
CV.min	7.97	0.57	0.16	83.96	8.55	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.34	47.05	57.51	21.68		$\rho = 0.5$
AIC	115.16	89.52	67.85	96.67		0 1 26 00
BIC	114.03	87.41	67	95.98		<i>Oracle</i> : 36.88
CV.1se	0.39	0.03	0.03	47.22	0.55	
CV.min	8.78	0.56	0.23	81.79	8.64	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.61	46.79	57.81	21.13		$\rho = 0.9$
AIC	115.04	89.73	68.06	96.25		
BIC	113.7	87.74	67.02	95.4		<i>Oracle</i> : 37.12
CV.1se	0.2	0.02	0.02	49.77	0.4	
CV.min	5.81	0.28	0.13	84.14	5.79	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.63	50.71	59.3	20.93		$\rho = 0$
AIC	115.53	84.84	65.39	96.71		
BIC	114.32	82.58	64.67	96.11		Oracle: 6.56
CV.1se	0.13	0.03	0.01	49.55	0.47	
CV.min	5.85	0.31	0.14	83.82	5.62	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.95	50.11	58.96	20.32		$\rho = 0.5$
AIC	115.3	85.71	65.69	96.73		,
BIC	114.2	83.42	64.91	96.1		Oracle: 6.85
CV.1se	0.21	0.01	0.03	46.17	0.43	
CV.rise CV.min	6.48	0.31	0.15	81.45	6.37	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.47	49.45	59.13	20.78	0.57	$\rho = 0.9$
AIC	115.3	85.99	65.81	96.51		,
BIC	113.86	83.58	65.16	95.7		Oracle: 6.4
DIC	113.00	05.50	05.10	73.1		

Table 78: Nonzero coefficients at n=100, binary design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	0.71	0.07	0.04	53.85	0.87	
CV.min	12.91	0.69	0.25	85.31	14.1	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.23	48.41	58.08	22.78		$\rho = 0$
AIC	114.65	87.76	66.3	96.1		Oracle : 91.18
BIC	113.48	85.63	65.6	95.42		07acic . 71.16
CV.1se	0.45	0.04	0.04	52.25	0.53	
CV.min	10.77	0.55	0.25	85.36	10.92	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.18	47.28	57.96	22.01		$\rho = 0.5$
AIC	114.85	88.49	66.77	96.21		Oracle : 90.76
BIC	113.71	86.45	65.87	95.66		Oracie . 90.70
CV.1se	0.54	0.06	0.03	50.49	0.56	
CV.min	9.88	0.6	0.24	83.82	10.41	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.39	48.25	57.97	21.66		$\rho = 0.9$
AIC	114.67	88.17	66.93	95.97		Oracle: 90.33
BIC	113.42	85.92	66.01	95.25		Oracie: 90.55
CV.1se	0.47	0.03	0.02	51.32	0.48	
CV.min	9.07	0.39	0.21	85.17	8.91	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.45	49.11	58.71	21.6		$\rho = 0$
AIC	115.24	85.63	65.62	96.59		,
BIC	114.08	83.57	64.94	96.04		<i>Oracle</i> : 41.56
CV.1se	0.4	0.04	0.03	50.67	0.45	
CV.min	7.8	0.49	0.18	84.22	7.69	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.32	49.29	58.67	21.02		$\rho = 0.5$
AIC	115.28	86.49	65.74	96.41		,
BIC	114.05	84.25	65.01	95.97		<i>Oracle</i> : 41.26
CV.1se	0.39	0.02	0.02	48.12	0.54	
CV.min	8.81	0.48	0.2	82.08	8.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.9	49.58	58.71	21.5	****	$\rho = 0.9$
AIC	114.88	86.34	66.1	96.19		,
BIC	113.58	83.96	65.35	95.67		Oracle: 40.75
CV.1se	0.18	0.02	0.02	50.14	0.42	
CV.min	5.9	0.25	0.17	83.88	5.82	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.73	52.14	60.03	20.23		$\rho = 0$
AIC	115.4	81.59	64.13	96.8		,
BIC	114.27	79.24	63.4	96.05		Oracle: 5.09
CV.1se	0.19	0.03	0.01	49.14	0.47	
CV.min	6.07	0.26	0.13	83.68	5.63	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.82	51.51	59.88	20.47	3.03	$\rho = 0.5$
AIC	115.43	82.47	64.43	96.7		,
BIC	114.34	79.92	63.69	96.1		Oracle: 5.6
CV.1se	0.18	0.02	0.01	46.55	0.44	
CV.13C	6.6	0.28	0.13	81.7	6.85	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.19	51.64	60.11	20.74	0.03	$\rho = 0.9$
AIC	115.45	82.32	64.49	96.47		
BIC	114.16	79.52	63.78	95.85		Oracle: 5.19
DIC	117.10	17.34	03.70	75.05		

Table 79: Nonzero coefficients at n=100, continuous design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL		
CV.1se	9.38	5.78	2.06	39.46	6.53	
CV.min	42.21	23.33	5.17	69.95	33	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	19.98	8.06	49.38	26.11		$\rho = 0$
AIC	109.18	96.34	74.39	86.92		Oracle : 20.75
BIC	107.66	94.99	72.97	79.99		Oracic . 20.73
CV.1se	1.31	1.14	0.63	37.72	1.69	
CV.min	15.97	10.34	1.86	70.04	10.04	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	9.96	2.15	39.05	21.17		$\rho = 0.5$
AIC	110.04	99.51	79.33	88.83		Oracle : 20.43
BIC	108.73	98.46	78.26	76.73		07466 . 20.43
CV.1se	1.37	1.21	1.03	12.61	1.04	
CV.min	8.59	5.65	1.7	34.12	3.12	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	7.53	1.51	1.07	19.16		$\rho = 0.9$
AIC	103.15	92.8	73.37	55.58		Oracle : 18.27
BIC	83.55	83.5	72.64	3.55		Oracle . 16.27
CV.1se	1.56	0.77	0.25	45.1	1.08	
CV.min	16.67	5.95	1.02	78.33	16.1	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.94	1.75	53.61	22.91		$\rho = 0$
AIC	113.1	97.55	75.58	93.22		Oracle: 14.43
BIC	111.76	96.18	74	91.6		Oracie : 14.45
CV.1se	0.51	0.34	0.19	39.43	0.61	
CV.min	9.68	3.89	0.7	72.96	7.51	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.04	0.87	51.96	20.33		$\rho = 0.5$
AIC	113.8	100.8	80.71	93.59		Oma ala . 14 10
BIC	112.15	99.36	78.76	90.59		<i>Oracle</i> : 14.19
CV.1se	1.1	0.96	0.9	6.97	0.95	
CV.min	9	5.41	1.56	25.81	3.19	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.81	1.47	1.78	13.76		$\rho = 0.9$
AIC	107.62	95.04	76	74.16		Oma ala . 11.62
BIC	105.62	94.71	75.15	4.18		<i>Oracle</i> : 11.62
CV.1se	0.34	0.08	0.03	48.1	0.51	
CV.min	6.94	1.3	0.23	81.96	6.86	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.64	7.83	56.31	20.66		$\rho = 0$
AIC	115.31	95.89	73.5	96.41		Oma ala . 7 97
BIC	114.09	94.57	71.52	95.81		<i>Oracle</i> : 7.87
CV.1se	0.09	0.07	0.02	40.22	0.43	
CV.min	5.87	1.58	0.28	74.78	5.28	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.28	0.63	55.06	20.2		$\rho = 0.5$
AIC	115.46	99.36	78.25	96.17		0 1 765
BIC	113.7	97.86	76.13	95.21		<i>Oracle</i> : 7.65
CV.1se	0.35	0.26	0.17	8.47	0.51	
CV.min	6.83	3.64	0.81	28.53	5.08	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	6.83	0.59	38.76	14.49		$\rho = 0.9$
AIC	114.01	97.56	79.03	90.1		Oma al - 15.52
BIC	113.06	97.15	78.01	33.12		<i>Oracle</i> : 5.53
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Table 80: Nonzero coefficients at n=100, continuous design, dense covariates, and decay 50.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$
AIC
AIC 113.97 93.61 70.8 94.96 $PA.19$
BIC 112.86 92.01 69.16 94.19 $CV.1se$ 0.21 0.09 0.03 41.73 0.53 $CV.min$ 7.5 1.72 0.24 76.39 7.17 $sd(\mu)/\sigma = 2$ AICc 5.7 1.12 55.6 20.13 $\rho = 0.5$ AIC 115.07 98.4 77 96.2 $CV.1se$ 0.51 0.45 0.31 7.67 0.61 $CV.min$ 7.71 4.6 1.2 27.5 5.56 $CV.1se$ 0.51 0.45 0.31 7.67 0.61 $CV.min$ 7.71 4.6 1.2 27.5 5.56 $CV.1se$ 0.51 0.48 25.08 14.94 $CV.1se$ 0.51 111.37 96.52 77.03 24.07 $CV.1se$ 0.43 0.07 0.02 51.02 0.54 $CV.1se$ 0.43 0.92 0.29 84.44 10.15 $cV.1se$ 0.40 0.40 68.37 95.48 $cV.1se$ 0.21 0.06 0.02 42.44 0.57 $cV.1se$ 0.21 0.22 $cV.1se$ 0.23 0.23 0.11 7.81 0.41 $cV.1se$ 0.24 0.25 $cV.1se$ 0.3 0.23 0.11 7.81 0.41 $cV.1se$ 0.41 $cV.1se$ 0.41 $cV.1se$ 0.41 $cV.1se$ 0.42 $cV.1se$ 0.41
BIC 112.86 92.01 69.16 94.19 CV.1se 0.21 0.09 0.03 41.73 0.53 CV.min 7.5 1.72 0.24 76.39 7.17 $sd(\mu)/\sigma = 2$ AIC 115.07 98.4 77 96.2 0.61
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BIC 111.37 96.52 77.03 24.07 CV.1se 0.43 0.07 0.02 51.02 0.54 CV.min 10.48 0.92 0.29 84.44 10.15 $sd(\mu)/\sigma = 1$ AICc 6.5 26.93 57.5 21.65 $\rho = 0$ AIC 114.66 92.06 69.78 96.07 BIC 113.67 90.44 68.37 95.48 CV.1se 0.21 0.06 0.02 42.44 0.57 CV.min 5.87 1.18 0.21 76.85 6.16 $sd(\mu)/\sigma = 1$ AICc 5.05 3.51 56.35 19.82 $\rho = 0.5$ AIC 115.47 96.49 74.99 96.32 Oracle : 30.42 EV.1se 0.3 0.23 0.11 7.81 0.41 CV.nin 5.86 3.2 0.67 28.37 5.21 $sd(\mu)/\sigma = 1$ AICc 6.04 0.46 51.2 14.45 $\rho = 0.9$
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BIC 113.67 90.44 68.37 95.48 Oracle: 30.65 CV.1se 0.21 0.06 0.02 42.44 0.57 CV.min 5.87 1.18 0.21 76.85 6.16 $sd(\mu)/\sigma = 1$ AICc 5.05 3.51 56.35 19.82 $\rho = 0.5$ AIC 115.47 96.49 74.99 96.32 Oracle: 30.42 BIC 113.77 94.61 72.98 95.56 Oracle: 30.42 CV.1se 0.3 0.23 0.11 7.81 0.41 CV.min 5.86 3.2 0.67 28.37 5.21 $sd(\mu)/\sigma = 1$ AICc 6.04 0.46 51.2 14.45 $\rho = 0.9$ AIC 114.45 97.04 78.89 91.88
BIC 113.67 90.44 68.37 95.48 CV.1se 0.21 0.06 0.02 42.44 0.57 CV.min 5.87 1.18 0.21 76.85 6.16 $sd(\mu)/\sigma = 1$ AIC 5.05 3.51 56.35 19.82 $\rho = 0.5$ AIC 115.47 96.49 74.99 96.32 BIC 113.77 94.61 72.98 95.56 CV.1se 0.3 0.23 0.11 7.81 0.41 CV.min 5.86 3.2 0.67 28.37 5.21 $sd(\mu)/\sigma = 1$ AIC 6.04 0.46 51.2 14.45 $\rho = 0.9$ AIC 114.45 97.04 78.89 91.88
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AIC 115.47 96.49 74.99 96.32 BIC 113.77 94.61 72.98 95.56 CV.1se 0.3 0.23 0.11 7.81 0.41 CV.min 5.86 3.2 0.67 28.37 5.21 sd(μ)/σ = 1 AIC 6.04 0.46 51.2 14.45 $\rho = 0.9$ AIC 114.45 97.04 78.89 91.88
BIC 113.77 94.61 72.98 95.56 Oracle: 30.42 CV.1se 0.3 0.23 0.11 7.81 0.41 CV.min 5.86 3.2 0.67 28.37 5.21 $sd(\mu)/\sigma = 1$ AICc 6.04 0.46 51.2 14.45 $\rho = 0.9$ AIC 114.45 97.04 78.89 91.88 Oracle: 27.66
BIC 113.77 94.61 72.98 95.56 CV.1se 0.3 0.23 0.11 7.81 0.41 CV.min 5.86 3.2 0.67 28.37 5.21 $sd(\mu)/\sigma = 1$ AIC 6.04 0.46 51.2 14.45 $\rho = 0.9$ AIC 114.45 97.04 78.89 91.88
CV.min 5.86 3.2 0.67 28.37 5.21 $sd(\mu)/\sigma = 1$ AICc 6.04 0.46 51.2 14.45 $\rho = 0.9$ AIC 114.45 97.04 78.89 91.88
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AIC 114.45 97.04 78.89 91.88 Oracle: 27.66
Uracle: 27 bb
BIC 113.37 96.51 77.61 42.4
CV.1se 0.3 0.04 0.03 48.78 0.43
CV.min 6.8 0.38 0.17 83.46 6.23 $\operatorname{sd}(\mu)/\sigma = 0.5$
AICc 5.14 46.46 59.19 20.55 $\rho = 0$
AIC 115.51 88.58 66.99 96.71 Oracle: 8.65
BIC 114.39 86./1 65.95 96.09
CV.1se 0.22 0.03 0.02 39.8 0.37
CV.min 5.6 0.6 0.19 74.69 5.09 $sd(\mu)/\sigma = 0.5$
AICc 4.62 21.05 58.6 19.88 $\rho = 0.5$
AIC 115.61 93 71.18 96.54 Oracle: 8.5
BIC 114.2 91.07 69.67 95.76
CV.1se 0.16 0.06 0.03 7.94 0.4
CV.min 4.34 1.46 0.25 28.76 3.8 $\operatorname{sd}(\mu)/\sigma = 0.5$
AICc 4.41 0.23 62.79 14.46 $\rho = 0.9$
AIC 116.02 94.45 77.16 94.19 Oracle: 7.26
BIC 114.99 93.78 75.88 58.47

Table 81: Nonzero coefficients at n=100, continuous design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	0.67	0.06	0.04	52.6	0.76	
CV.min	13.65	0.82	0.27	85.39	13.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	7.11	34.13	57.96	22.79		$\rho = 0$
AIC	114.54	90.7	68.26	95.72		Oracle: 77.53
BIC	113.41	88.92	67.22	95.01		Oracic . 11.55
CV.1se	0.22	0.09	0.02	41.74	0.41	
CV.min	6.41	1.13	0.19	75.51	6.44	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	4.88	5.81	57.14	20.33		$\rho = 0.5$
AIC	115.39	96.11	73.86	96.26		Oracle: 77.53
BIC	113.81	94.16	71.99	95.3		Oracie . 11.55
CV.1se	0.26	0.15	0.1	8.03	0.38	
CV.min	5.95	2.79	0.59	28.47	4.99	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.97	0.39	55.53	15.36		$\rho = 0.9$
AIC	114.85	96.86	78.52	92.57		Oma ala . 76 01
BIC	113.69	96.21	77.41	45.46		<i>Oracle</i> : 76.01
CV.1se	0.3	0.05	0.03	51.64	0.44	
CV.min	8.77	0.44	0.19	83.44	8.33	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.87	43.26	58.6	20.88		$\rho = 0$
AIC	115.09	89.05	67.39	96.38		0 1 27 66
BIC	114	87.23	66.38	95.79		<i>Oracle</i> : 37.66
CV.1se	0.23	0.05	0.02	41.34	0.41	
CV.min	6.02	0.75	0.18	76.06	5.42	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.92	15.17	58.29	19.95		$\rho = 0.5$
AIC	115.57	94	72.01	96.38		,
BIC	113.99	92	70.37	95.56		<i>Oracle</i> : 37.21
CV.1se	0.13	0.1	0.03	7.66	0.35	
CV.min	4.44	1.82	0.34	29.36	4.55	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.79	0.18	61.89	14.63	.,,,,	$\rho = 0.9$
AIC	115.68	95.57	77.87	93.94		,
BIC	114.84	94.91	76.41	53.27		<i>Oracle</i> : 34.56
CV.1se	0.2	0.04	0.02	48.56	0.42	
CV.min	6.36	0.35	0.18	82.92	5.52	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.9	50.95	60.05	20.72		$\rho = 0$
AIC	115.38	84.92	65.25	96.58		,
BIC	114.25	82.92	64.42	95.97		Oracle: 6.81
CV.1se	0.19	0.02	0.01	38.82	0.38	
CV.min	5.61	0.41	0.16	74.96	5.09	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.38	39.49	59.56	19.93	3.07	$\rho = 0.5$
AIC	115.44	89.9	68.67	96.71		,
BIC	113.88	87.92	67.64	95.92		Oracle: 6.7
CV.1se	0.11	0.04	0.02	7.47	0.35	
CV.13C	3.86	0.96	0.22	28.61	3.4	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.23	0.47	64.76	14.1	J.T	$\rho = 0.9$
AIC	116.35	91.88	75.83	94.49		,
BIC	115.4	91.00	74.37	57.59		Oracle: 6.45
ыс	113.4	71.01	14.31	31.39		

Table 82: Nonzero coefficients at n=100, continuous design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.39	0.05	0.03	52.15	0.57	
CV.min	12.92	0.49	0.2	85.14	12.66	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	6.57	46.91	58.63	22.66		$\rho = 0$
AIC	114.72	87.92	66.31	96.21		<i>Oracle</i> : 91.12
BIC	113.53	85.95	65.55	95.64		074666.71.12
CV.1se	0.13	0.03	0.02	40.77	0.45	
CV.min	5.82	0.73	0.16	75.21	6.34	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.16	20.41	58.08	20.33		$\rho = 0.5$
AIC	115.38	92.81	70.86	96.34		Oracle : 91.12
BIC	113.65	90.95	69.43	95.54		Oracle . 91.12
CV.1se	0.1	0.09	0.04	7.82	0.36	
CV.min	4.77	1.7	0.32	29	4.33	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	5.06	0.24	62.47	15.09		$\rho = 0.9$
AIC	115.24	94.82	77.08	93.74		0100-40
BIC	114.18	94.19	75.55	54.71		Oracle: 90.49
CV.1se	0.32	0.05	0.03	50.59	0.45	
CV.min	8.62	0.38	0.2	83.59	9.19	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	5.72	50.11	59.32	21.22		$\rho = 0$
AIC	114.97	85.8	65.3	96.45		
BIC	113.95	83.48	64.34	95.88		<i>Oracle</i> : 41.19
CV.1se	0.19	0.03	0.01	40.32	0.36	
CV.min	5.87	0.44	0.16	75.03	5.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.63	33.38	59.49	20.09		$\rho = 0.5$
AIC	115.52	90.77	69.29	96.41		'
BIC	113.74	88.77	68.06	95.73		<i>Oracle</i> : 41.33
CV.1se	0.11	0.04	0.02	7.11	0.35	
CV.min	3.8	1.17	0.21	28.46	3.72	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	4.36	0.19	63.75	14.38		$\rho = 0.9$
AIC	115.83	92.95	76.28	94.55		'
BIC	114.57	92.2	74.93	58.59		<i>Oracle</i> : 39.92
CV.1se	0.17	0.04	0.02	48.98	0.41	
CV.min	6.19	0.27	0.17	83.35	5.93	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.79	53.01	60.14	20.33		$\rho = 0$
AIC	115.2	81.51	64.03	96.69		,
BIC	114.26	79.22	63.24	96.1		Oracle: 5.4
CV.1se	0.13	0.03	0.01	38.83	0.35	
CV.min	5.75	0.3	0.13	74.26	5.07	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.8	48.9	60.57	19.92	3.07	$\rho = 0.5$
AIC	115.71	86.57	66.78	96.49		
BIC	113.99	84.52	65.89	95.65		Oracle: 5.46
CV.1se	0.09	0.02	0.01	7.04	0.35	
CV.13c	3.32	0.77	0.18	28.68	3.24	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.08	2.02	65.28	14.17	J.2T	$\rho = 0.9$
AICC	116.06	89.46	74.33	94.64		
BIC		88.47				Oracle: 5.28
DIC	115.1	00.47	72.94	58.05		

Table 83: Nonzero coefficients at n=100, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	15.26	10.62	4.77	34.95	9.61	
CV.min	51.8	31.21	10.08	63.72	26.46	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	23.67	17.33	47.63	27.06		$\rho = 0$
AIC	107.57	95.72	73.55	83.28		Oracle: 10
BIC	105.8	94.27	72.36	70.2		Oracie. 10
CV.1se	13.29	9.46	3.97	37.88	9.27	
CV.min	49.64	31.3	9.03	66.79	25.74	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	22.91	17.68	48.1	27.48		$\rho = 0.5$
AIC	108.01	96.82	74.63	84.59		Oracle:10
BIC	106.54	95.38	73.26	75.65		Oracle: 10
CV.1se	12.9	9.51	3.65	37.95	9.13	
CV.min	49.97	31.29	8.63	66.12	25.43	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	22.52	17.48	47.23	27.33		$\rho = 0.9$
AIC	108.2	97.07	75.19	84.9		Oracle: 10
BIC	106.67	95.7	73.7	74.68		Oracie: 10
CV.1se	2.24	1.32	0.37	44.25	1.8	
CV.min	22.92	8.52	1.58	76.86	20.44	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.31	10.3	52.27	23.99		$\rho = 0$
AIC	112.3	97.2	75.73	92.06		,
BIC	110.82	95.77	74.01	90.62		Oracle: 10
CV.1se	1.87	0.97	0.4	45.65	1.34	
CV.min	20.75	8.04	1.29	78.54	17.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.25	9.71	51.62	23.01		$\rho = 0.5$
AIC	112.86	98.02	76.29	92.45		,
BIC	111.36	96.45	74.48	90.71		Oracle: 10
CV.1se	2.07	0.91	0.36	43.34	1.56	
CV.min	20.36	8.18	1.35	75.11	17.3	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.44	9.29	51.97	23.82		$\rho = 0.9$
AIC	112.43	98.3	76.93	92.28		,
BIC	110.79	96.77	75.18	90.7		Oracle: 10
CV.1se	0.3	0.05	0.03	48.68	0.51	
CV.min	7.54	1.43	0.26	81.23	7.13	$sd(\mu)/\sigma = 0.5$
AICc	5.83	26.06	54.48	21.04		$\rho = 0$
AIC	114.97	96.18	74.3	96.04		,
BIC	113.74	94.86	72.14	95.37		Oracle: 10
CV.1se	0.18	0.07	0.03	48.41	0.53	
CV.min	7.54	1.3	0.27	82.65	6.92	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.72	23.47	54.59	21.12		$\rho = 0.5$
AIC	114.94	96.9	74.9	96.2		,
BIC	113.77	95.4	72.7	95.47		Oracle:10
CV.1se	0.46	0.08	0.05	46.13	0.56	
CV.13C	7.85	1.39	0.33	80.29	7.45	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.61	21.6	54.19	21.05	7.73	$\rho = 0.9$
AIC	115.04	96.82	74.9	96.08		,
BIC	113.73	95.31	72.73	95.3		Oracle:10
БІС	113.73	95.51	14.13	93.3		

Table 84: Nonzero coefficients at n=100, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}~\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	16.13	10.09	2.67	40.53	14.08	
CV.min	56.2	31.18	8.11	68.24	43.57	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.81	19.81	50.58	29.52		$\rho = 0$
AIC	109.45	94.74	71.57	86.29		Oracle: 10
BIC	107.59	93.14	70.12	81.32		Oracic . 10
CV.1se	12.85	8.14	2.13	42.89	12.2	
CV.min	52.22	29.99	6.41	72.28	42.91	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	23.98	21.35	50.61	30.33		$\rho = 0.5$
AIC	110	95.56	72.79	88.07		Oracle: 10
BIC	108.16	93.96	71.14	85.1		Oracic . 10
CV.1se	12.45	7.88	1.6	43.29	11.43	
CV.min	51.72	28.89	5.45	72.13	41.13	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	23.49	21.43	50.1	29.47		$\rho = 0.9$
AIC	109.97	95.94	73.2	88.1		Oracle:10
BIC	108.29	94.27	71.58	84.75		Oracie . 10
CV.1se	1.71	0.53	0.18	46.33	1.54	
CV.min	21.83	4.96	0.88	79.69	19.74	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.04	21.93	53.84	24.64		$\rho = 0$
AIC	113.3	95.24	72.79	93.32		0 1 10
BIC	111.88	93.85	71.27	92.44		Oracle: 10
CV.1se	1.35	0.49	0.15	48.46	1.05	
CV.min	18.23	4.31	0.76	80.96	17.35	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	10.07	19.99	54.25	23.47		$\rho = 0.5$
AIC	113.55	96.07	74.08	93.89		0 1 10
BIC	112.04	94.68	72.11	93.01		Oracle: 10
CV.1se	1.48	0.45	0.15	46.58	1.43	
CV.min	18.38	4.3	0.72	78.04	16.64	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	9.91	18.8	53.45	23.86		$\rho = 0.9$
AIC	113.5	96.56	74.22	93.69		,
BIC	112.07	94.87	72.43	92.51		Oracle: 10
CV.1se	0.19	0.05	0.03	48.89	0.49	
CV.min	7.2	0.78	0.22	82.38	7.36	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.69	41.34	56.18	20.81		$\rho = 0$
AIC	115.05	93.33	71.05	96.19		,
BIC	113.79	91.61	69.48	95.57		Oracle: 10
CV.1se	0.15	0.09	0.03	48.92	0.51	
CV.min	6.87	0.75	0.22	83.16	6.76	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.32	39.19	56.2	20.6		$\rho = 0.5$
AIC	115.1	93.86	71.59	96.49		,
BIC	113.89	92.23	69.58	95.72		Oracle: 10
CV.1se	0.35	0.08	0.03	47.2	0.51	
CV.min	7.52	0.85	0.23	81.11	7.4	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.54	39.18	55.9	21.08	. • •	$\rho = 0.9$
AIC	115.04	94.12	71.57	96.28		,
BIC	113.72	92.32	70.03	95.6		Oracle: 10
	110.12	72.52	, 0.03	75.0		

Table 85: Nonzero coefficients at n=100, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	16.25	9.9	2.56	40.8	13.89	
CV.min	56.12	30.29	7.09	68.19	43.91	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.92	20.1	50.87	29.8		$\rho = 0$
AIC	109.5	94.17	71.06	86.42		Oracle:10
BIC	107.71	92.58	69.35	81.31		Oracle . 10
CV.1se	12.66	7.82	1.83	43.08	12.63	
CV.min	51.74	29.5	5.79	72.42	45.16	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	23.93	21.36	51.14	30.35		$\rho = 0.5$
AIC	110.06	95.36	72.61	88.21		Oracle:10
BIC	108.22	93.81	71.01	85.14		Oracle . 10
CV.1se	12.13	7.54	1.57	43.65	11.08	
CV.min	51.24	27.8	5.46	72.44	42.37	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	23.51	22.16	50.82	29.91		$\rho = 0.9$
AIC	109.96	95.43	72.92	88.15		Oma ala . 10
BIC	108.27	93.79	71.36	84.83		Oracle:10
CV.1se	1.67	0.54	0.17	46.44	1.52	
CV.min	21.94	4.62	0.85	79.58	19.81	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.21	25.15	54.4	24.47		$\rho = 0$
AIC	113.21	94.98	72.58	93.3		·
BIC	111.84	93.46	70.87	92.48		Oracle: 10
CV.1se	1.31	0.46	0.16	48.53	1.11	
CV.min	17.75	3.93	0.74	81.02	17.72	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	9.99	22.08	53.71	23.21		$\rho = 0.5$
AIC	113.45	95.41	73.3	93.87		,
BIC	112.21	93.9	71.58	93.07		Oracle: 10
CV.1se	1.48	0.44	0.15	46.94	1.36	
CV.min	18.39	4.36	0.68	78.06	16.65	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	9.9	20.73	54.31	23.77		$\rho = 0.9$
AIC	113.62	95.86	73.83	93.83		
BIC	111.78	94.25	72.08	92.75		Oracle: 10
CV.1se	0.2	0.05	0.03	48.94	0.51	
CV.min	7.25	0.85	0.24	82.54	7.42	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.58	42.66	56.7	20.93		$\rho = 0$
AIC	115.13	92.77	70.27	96.11		
BIC	113.8	91.17	68.87	95.44		Oracle: 10
CV.1se	0.13	0.06	0.03	48.89	0.47	
CV.min	7.36	0.71	0.23	82.88	6.72	$sd(\mu)/\sigma = 0.5$
AICc	5.47	40.99	56.27	20.73	***-	$\rho = 0.5$
AIC	115.14	93.36	71.01	96.47		
BIC	114.08	91.68	69.34	95.79		Oracle: 10
CV.1se	0.31	0.06	0.03	46.93	0.54	
CV.nsc	7.5	0.77	0.22	80.97	7.4	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.59	40.25	56.13	21.02		$\rho = 0.9$
AIC	115.22	93.28	71.09	96.18		
BIC	113.78	91.46	69.58	95.53		Oracle:10
DIC	113.70	71. 4 0	07.30	75.55		

Table 86: Nonzero coefficients at n=100, binary design, sparse covariates, and decay 200.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						44.62	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		25.96			30.09		$\rho = 0$
BIC 101.7 92.34 89.24 81.5 CV.lse 12.64 7.58 1.76 43.12 12.52 $\rho = 0.5$ AIC 24.19 21.69 51.09 30.58 $\rho = 0.5$ AIC 109.97 95.16 72.22 88.27 BIC 108.2 93.63 70.63 85.32 CV.lse 12.47 7.56 1.56 43.72 11.49 $\rho = 0.9$ AIC 110.06 95.27 72.43 88.19 Oracle : 10 AIC 11.19 26.01 54.39 24.47 $\rho = 0.9$ AIC 113.26 94.75 72.32 93.32 AIC 113.26 94.75 72.32 93.32 AIC 113.26 94.75 72.32 93.32 Oracle : 10 AIC 111.88 92.98 70.66 92.52 Oracle : 10 Oracle : 10 AIC 113.55 95.31 73.21 93.9 BIC 112.09 93.71 71.35 93.02 Oracle : 10 Oracle : 10 AIC 112.09 93.71 71.35 93.02 Oracle : 10 Oracle :							$Oracle \cdot 10$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC						Oracic . 10
AICc 24.19 21.69 51.09 30.58 $\rho = 0.5$ AIC 109.97 95.16 72.22 88.27 $\rho = 0.5$ AIC 109.97 95.16 72.22 88.27 $\rho = 0.5$ AIC 108.2 93.63 70.63 85.32 $\rho = 0.5$ AIC 108.2 93.63 70.63 85.32 $\rho = 0.5$ AIC 108.2 93.63 5.1 72.34 43.41 $\rho = 0.5$ AICc 23.59 22.25 51.31 29.76 $\rho = 0.9$ AIC 110.06 95.27 72.43 88.19 $\rho = 0.9$ AIC 110.06 95.27 72.43 88.19 $\rho = 0.9$ AIC 110.08.38 93.75 70.8 85.2 $\rho = 0.9$ AIC 110.06 95.27 72.43 88.19 $\rho = 0.9$ AIC 110.06 95.27 72.43 88.19 $\rho = 0.9$ AIC 111.19 26.01 54.39 24.47 $\rho = 0.0$ AIC 113.26 94.75 72.32 93.32 $\rho = 0.0$ AIC 113.26 94.75 72.32 93.32 $\rho = 0.0$ AIC 113.88 92.98 70.66 92.52 $\rho = 0.0$ AIC 113.89 0.49 0.14 48.48 1.08 $\rho = 0.0$ AIC 113.55 95.31 73.21 93.9 $\rho = 0.0$ AIC 113.55 95.31 73.21 93.9 $\rho = 0.0$ AIC 113.55 95.31 73.21 93.9 $\rho = 0.0$ AIC 113.62 94.7 0.17 47.01 1.38 $\rho = 0.0$ AIC 113.62 95.64 73.58 93.83 BIC 112.09 93.71 71.35 93.02 $\rho = 0.0$ AIC 113.62 95.64 73.58 93.83 BIC 112.03 93.96 72.05 92.8 $\rho = 0.0$ AIC 113.64 95.64 73.58 93.83 BIC 112.03 93.96 72.05 92.8 $\rho = 0.0$ AIC 113.65 95.44 73.58 93.83 BIC 112.03 93.96 72.05 92.8 $\rho = 0.0$ AIC 113.64 90.86 $\rho = 0.0$ AIC 113.65 95.44 73.58 93.83 BIC 112.03 93.96 72.05 92.8 $\rho = 0.0$ AIC 113.84 90.98 68.77 95.54 $\rho = 0.0$ AIC 113.85 93.90 $\rho = 0.0$ AIC 113.84 90.98 68.77 95.54 $\rho = 0.0$ AIC 113.87 90.88 $\rho = 0.0$ AIC 115.05 92.49 70.28 96.17 $\rho = 0.0$ AIC 115.05 92.49 70.28 96.17 $\rho = 0.0$ AIC 115.05 92.49 70.28 96.17 $\rho = 0.0$ AIC 115.25 93.32 70.79 96.45 $\rho = 0.0$ AIC 115.32 93.22 70.99 96.26 $\rho = 0.0$ AIC 115.32 93.22 70.99 96.26 $\rho = 0.0$ AIC 115.32 93.22 70.99 96.26		12.64	7.58	1.76	43.12	12.52	
AIC 109.97 95.16 72.22 88.27 $Oracle: 10$ BIC 108.2 93.63 70.63 85.32 $Oracle: 10$ CV.1se 12.47 7.56 1.56 43.72 11.49 $Oracle: 10$ AIC 110.06 95.27 72.43 88.19 $Oracle: 10$ BIC 108.38 93.75 70.8 85.2 $Oracle: 10$ BIC 108.38 93.75 70.8 85.2 $Oracle: 10$ CV.min 21.53 4.46 0.88 79.52 19.68 $oracle: 10$ AIC 11.19 26.01 54.39 24.47 $oracle: 10$ AIC 11.18 29.98 70.66 92.52 $Oracle: 10$ BIC 111.88 29.98 70.66 92.52 $Oracle: 10$ CV.1se 1.39 0.49 0.14 48.48 1.08 $oracle: 10$ CV.1se 1.39 0.49 0.14 48.48 1.08 $oracle: 10$ AIC 113.55 95.31 73.21 93.9 $oracle: 10$ BIC 112.09 93.71 71.35 93.02 $oracle: 10$ CV.1se 1.49 0.47 0.17 47.01 1.38 $oracle: 10$ CV.1se 1.49 0.47 0.17 47.01 1.38 $oracle: 10$ AIC 113.62 95.64 73.58 93.83 $oracle: 10$ AIC 113.62 95.64 73.58 93.83 $oracle: 10$ CV.1se 1.39 0.49 0.44 49.01 0.5 $oracle: 10$ CV.1se 1.39 0.49 0.49 0.49 0.49 0.40 0.70 0.70 0.70 0.70 0.70 0.70 0.70	CV.min	51.72	28.7	5.71		45.49	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 108.2 93.63 70.63 85.32 Oracle : 10 CV.Ise 12.47 7.56 1.56 43.72 11.49 c/// (μ)/σ = 2 CV.min 52.07 28.03 5.1 72.34 43.41 sd(μ)/σ = 2 AIC 23.59 22.25 51.31 29.76 ρ = 0.9 AIC 110.06 95.27 72.43 88.19 Oracle : 10 CV.Ise 1.67 0.58 0.17 46.52 1.53 CV.Ise 1.67 0.58 0.17 46.52 1.53 CV.min 21.53 4.46 0.88 79.52 19.68 sd(μ)/σ = 1 AIC 11.19 26.01 54.39 24.47 ρ = 0 0 AIC 113.26 94.75 72.32 93.32 Oracle : 10 CV.Ise 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 sd(μ)/σ = 0.5 <td< td=""><td>AICc</td><td>24.19</td><td>21.69</td><td>51.09</td><td>30.58</td><td></td><td>$\rho = 0.5$</td></td<>	AICc	24.19	21.69	51.09	30.58		$\rho = 0.5$
RIC 108.2 93.63 70.63 85.32 CV.lse 12.47 7.56 1.56 43.72 11.49 CV.min 52.07 28.03 5.1 72.34 43.41 sd(μ)/ σ = 2 AICc 23.59 22.25 51.31 29.76 ρ = 0.9 AIC 110.06 95.27 72.43 88.19 Oracle : 10 CV.lse 1.67 0.58 0.17 46.52 1.53 CV.min 21.53 4.46 0.88 79.52 19.68 sd(μ)/ σ = 1 AICc 11.19 26.01 54.39 24.47 ρ = 0 AIC 111.88 92.98 70.66 92.52 Oracle : 10 CV.lse 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 sd(μ)/ σ = 1 AICc 13.55 95.31 73.21 93.9 Oracle : 10 CV.lse 1.49 0.47 0.17 47.01 1.38 CV.min 18.57 3.81 0.71 78.45 16.48 sd(μ)/ σ = 1 AICc 9.44 22.28 54.36 24.04 ρ = 0.9 AICc 113.62 95.64 73.58 93.83 Oracle : 10 CV.lse 0.18 0.05 0.04 49.01 0.5 CV.lse 0.13 0.06 0.02 49.06 0.49 CV.lse 0.32 0.09 0.02 47.14 0.5 CV.lse 0.55 0.04 0.09 0.02 47.14 0.5 CV.lse 0.55 0.09 0.02 47.14 0.5	AIC	109.97	95.16	72.22	88.27		Omagle , 10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	108.2	93.63	70.63	85.32		Oracie . 10
AICc 23.59 22.25 51.31 29.76 $\rho = 0.9$ AIC 110.06 95.27 72.43 88.19 $\rho = 0.9$ BIC 108.38 93.75 70.8 85.2 $\rho = 0.9$ CV.1se 1.67 0.58 0.17 46.52 1.53 $\rho = 0.9$ AIC 11.19 26.01 54.39 24.47 $\rho = 0.9$ AIC 113.26 94.75 72.32 93.32 $\rho = 0.9$ AIC 113.26 94.75 72.32 93.32 $\rho = 0.9$ CV.lse 1.39 0.49 0.14 48.48 1.08 $\rho = 0.9$ AIC 113.55 95.31 73.21 93.9 $\rho = 0.9$ AIC 113.55 95.31 73.21 93.9 $\rho = 0.9$ AIC 112.09 93.71 71.35 93.02 $\rho = 0.9$ AIC 113.62 94.77 0.17 47.01 1.38 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 $\rho = 0.9$ AIC 113.84 90.98 68.77 95.54 $\rho = 0.9$ AIC 115.05 92.49 70.28 96.17 $\rho = 0.9$ AIC 115.05 92.49 70.28 96.17 $\rho = 0.9$ AIC 115.25 93.32 70.79 96.45 $\rho = 0.9$ AIC 15.32 93.92 70.92 96.26 $\rho = 0.9$ AIC 15.32 93.22 70.99 96.45 $\rho = 0.9$ AIC 15.32 93.22 70.99 96.45 $\rho = 0.9$ AIC 15.32 93.22 70.99 96.26	CV.1se	12.47	7.56	1.56	43.72	11.49	
AIC 110.06 95.27 72.43 88.19 $Oracle: 10$ BIC 108.38 93.75 70.8 85.2 $Oracle: 10$ CV.lse 1.67 0.58 0.17 46.52 1.53 $Oracle: 10$ CV.min 21.53 4.46 0.88 79.52 19.68 $oracle: 10$ AICc 11.19 26.01 54.39 24.47 $oracle: 10$ AIC 113.26 94.75 72.32 93.32 $Oracle: 10$ BIC 111.88 92.98 70.66 92.52 $Oracle: 10$ CV.lse 1.39 0.49 0.14 48.48 1.08 $Oracle: 10$ CV.min 17.82 3.67 0.7 80.79 16.98 $oracle: 10$ AICc 9.77 23.42 53.92 23.32 $oracle: 10$ AIC 113.55 95.31 73.21 93.9 $oracle: 10$ BIC 112.09 93.71 71.35 93.02 $oracle: 10$ CV.lse 1.49 0.47 0.17 47.01 1.38 $oracle: 10$ CV.min 18.57 3.81 0.71 78.45 16.48 $oracle: 10$ AICc 9.44 22.28 54.36 24.04 $oracle: 10$ AIC 113.62 95.64 73.58 93.83 $oracle: 10$ AIC 113.62 95.64 73.58 93.83 $oracle: 10$ CV.lse 0.18 0.05 0.04 49.01 0.5 $oracle: 10$ CV.lse 0.18 0.05 0.04 49.01 0.5 $oracle: 10$ AIC 115.05 92.49 70.28 96.17 $oracle: 10$ AIC 115.25 93.32 70.79 96.45 $oracle: 10$ CV.lse 0.32 0.09 0.02 47.14 0.5 $oracle: 10$ AIC 15.32 93.22 70.99 96.26 $oracle: 10$ AIC 15.32 93.22 70.99 96.26	CV.min	52.07	28.03	5.1	72.34	43.41	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 108.38 93.75 70.8 85.2 Oracle: 10 CV.1se 1.67 0.58 0.17 46.52 1.53 $CV.min$ 21.53 4.46 0.88 79.52 19.68 $sd(\mu)/\sigma = 1$ AICc 11.19 26.01 54.39 24.47 $\rho = 0$ AIC 113.26 94.75 72.32 93.32 BIC 111.88 92.98 70.66 92.52 Oracle: 10 CV.1se 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 $sd(\mu)/\sigma = 1$ AICc 9.77 23.42 53.92 23.32 $\rho = 0.5$ AIC 113.55 95.31 73.21 93.9 BIC 112.09 93.71 71.35 93.02 Oracle: 10 CV.1se 1.49 0.47 0.17 47.01 1.38 CV.min 18.57 3.81 0.71 78.45 16.48 $sd(\mu)/\sigma = 1$ AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 BIC 112.03 93.96 72.05 92.8 Oracle: 10 CV.1se 0.18 0.05 0.04 49.01 0.5 CV.min 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AICc 5.68 42.76 56.51 20.96 $\rho = 0$ AIC 115.05 92.49 70.28 96.17 Oracle: 10 CV.1se 0.13 0.06 0.02 49.06 0.49 CV.min 7.18 0.72 0.22 82.87 6.86 $sd(\mu)/\sigma = 0.5$ AICc 5.32 41.42 56.52 20.47 $\rho = 0.5$ AIC 113.97 91.47 69.17 95.78 Oracle: 10 CV.1se 0.13 0.06 0.02 49.06 0.49 CV.min 7.18 0.72 0.22 82.87 6.86 $sd(\mu)/\sigma = 0.5$ AIC 115.25 93.32 70.79 96.45 BIC 113.97 91.47 69.17 95.78 Oracle: 10 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.5$ AICc 5.56 41.04 56.	AICc	23.59	22.25	51.31	29.76		$\rho = 0.9$
BIC 108.38 93.75 $\sqrt{0.8}$ 85.2 CV.Ise 1.67 0.58 0.17 46.52 1.53 CV.min 21.53 4.46 0.88 79.52 19.68 $sd(\mu)/\sigma = 1$ AIC 11.19 26.01 54.39 24.47 $\rho = 0$ AIC 113.26 94.75 72.32 93.32 Oracle : 10 CV.Ise 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 $sd(\mu)/\sigma = 1$ AIC 9.77 23.42 53.92 23.32 $\rho = 0.5$ AIC 113.55 95.31 73.21 93.9 Oracle : 10 CV.Ise 1.49 0.47 0.17 47.01 1.38 $sd(\mu)/\sigma = 1$ AIC 1.49 0.47 0.17 47.01 1.38 $sd(\mu)/\sigma = 1$ AIC 113.62 95.64 73.58 93.83 Oracle : 10 CV.Ise 0.18	AIC	110.06	95.27	72.43	88.19		Ongolo , 10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	108.38	93.75	70.8	85.2		Oracie: 10
AICc 11.19 26.01 54.39 24.47 $\rho = 0$ AIC 113.26 94.75 72.32 93.32 BIC 111.88 92.98 70.66 92.52 CV.1se 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 $sd(\mu)/\sigma = 1$ AICc 9.77 23.42 53.92 23.32 $\rho = 0.5$ AIC 113.55 95.31 73.21 93.9 BIC 112.09 93.71 71.35 93.02 CV.1se 1.49 0.47 0.17 47.01 1.38 CV.min 18.57 3.81 0.71 78.45 16.48 $sd(\mu)/\sigma = 1$ AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 BIC 112.03 93.96 72.05 92.8 CV.1se 0.18 0.05 0.04 49.01 0.5 CV.min 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AIC 15.05 92.49 70.28 96.17 BIC 113.84 90.98 68.77 95.54 CV.1se 0.13 0.06 0.02 49.06 0.49 CV.1se 0.13 0.06 0.00 0.02 49.06 0.49 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.1se 0.32 0.09 0.02 47.14 CV.1se 0.5 CV.1se 0.56 41.04 56.52 21.18 AICc 5.56 41.04 56.52 21.18 AICc 115.32 93.22 70.99 96.26	CV.1se	1.67	0.58	0.17	46.52	1.53	
AICc 11.19 26.01 54.39 24.47 $\rho = 0$ AIC 113.26 94.75 72.32 93.32 BIC 111.88 92.98 70.66 92.52 CV.1se 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 $sd(\mu)/\sigma = 1$ AICc 9.77 23.42 53.92 23.32 $\rho = 0.5$ AIC 113.55 95.31 73.21 93.9 BIC 112.09 93.71 71.35 93.02 CV.1se 1.49 0.47 0.17 47.01 1.38 CV.min 18.57 3.81 0.71 78.45 16.48 $sd(\mu)/\sigma = 1$ AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 BIC 112.03 93.96 72.05 92.8 CV.1se 0.18 0.05 0.04 49.01 0.5 CV.min 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AIC 15.05 92.49 70.28 96.17 BIC 113.84 90.98 68.77 95.54 CV.1se 0.13 0.06 0.02 49.06 0.49 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.1se 0.32 0.09 0.02 47.14 CV.1se 0.5 CV.1se 0.56 41.04 56.52 21.18 AICc 5.56 41.04 56.52 21.18 AICc 115.32 93.22 70.99 96.26	CV.min	21.53	4.46	0.88	79.52	19.68	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 111.88 92.98 70.66 92.52 Oracle: 10 CV.1se 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 $sd(\mu)/\sigma = 1$ AICc 9.77 23.42 53.92 23.32 $\rho = 0.5$ AIC 113.55 95.31 73.21 93.9 Oracle: 10 CV.1se 1.49 0.47 0.17 47.01 1.38 $cccccccccccccccccccccccccccccccccccc$	AICc	11.19	26.01	54.39	24.47		
BIC 111.88 92.98 70.66 92.52 Oracle: 10 CV.1se 1.39 0.49 0.14 48.48 1.08 CV.min 17.82 3.67 0.7 80.79 16.98 $sd(\mu)/\sigma = 1$ AICc 9.77 23.42 53.92 23.32 $\rho = 0.5$ AIC 113.55 95.31 73.21 93.9 Oracle: 10 CV.1se 1.49 0.47 0.17 47.01 1.38 $sd(\mu)/\sigma = 1$ CV.min 18.57 3.81 0.71 78.45 16.48 $sd(\mu)/\sigma = 1$ AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 Oracle: 10 CV.1se 0.18 0.05 0.04 49.01 0.5 CV.min 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AIC 115.05 92.49 70.28 96.17 Oracle: 10 CV.1se <td>AIC</td> <td>113.26</td> <td>94.75</td> <td>72.32</td> <td>93.32</td> <td></td> <td>0 1 10</td>	AIC	113.26	94.75	72.32	93.32		0 1 10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	111.88		70.66	92.52		Oracle: 10
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	1.39	0.49	0.14	48.48	1.08	
AICc 9.77 23.42 53.92 23.32 $ρ = 0.5$ AIC 113.55 95.31 73.21 93.9 BIC 112.09 93.71 71.35 93.02 $Oracle : 10$ CV.1se 1.49 0.47 0.17 47.01 1.38 $CV.min$ 18.57 3.81 0.71 78.45 16.48 $sd(μ)/σ = 1$ AICc 9.44 22.28 54.36 24.04 $ρ = 0.9$ AIC 113.62 95.64 73.58 93.83 $Oracle : 10$ CV.1se 0.18 0.05 0.04 49.01 0.5 $CV.min$ 7.3 0.76 0.22 82.27 7.55 $sd(μ)/σ = 0.5$ AICc 5.68 42.76 56.51 20.96 $ρ = 0$ AIC 113.84 90.98 68.77 95.54 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $CV.min$ 7.18 0.72 0.22 82.87 6.86 $sd(μ)/σ = 0.5$ AICc 5.32 41.42 56.52 20.47 $ρ = 0.5$ AIC 115.25 93.32 70.79 96.45 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $Oracle : 10$ AIC 115.32 93.22 70.92 96.26 $Oracle : 10$		17.82					$\operatorname{sd}(\mu)/\sigma = 1$
BIC 112.09 93.71 71.35 93.02 $Oracle : 10$ CV.1se 1.49 0.47 0.17 47.01 1.38 $CV.min$ 18.57 3.81 0.71 78.45 16.48 $sd(\mu)/\sigma = 1$ AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 $Oracle : 10$ CV.1se 0.18 0.05 0.04 49.01 0.5 $CV.min$ 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AICc 5.68 42.76 56.51 20.96 $\rho = 0$ AIC 115.05 92.49 70.28 96.17 $Oracle : 10$ BIC 113.84 90.98 68.77 95.54 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.72 0.22 82.87 6.86 $oracle : 10$ AIC 115.25 93.32 70.79 96.45 $oracle : 10$ BIC 113.97 91.47 69.17 95.78 $oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $oracle : 10$ AIC 15.32 93.22 70.92 96.26 $oracle : 10$ AIC 115.32 93.22 70.99 96.26	AICc	9.77	23.42	53.92	23.32		$\rho = 0.5$
BIC 112.09 93.71 71.35 93.02 $Oracle : 10$ CV.1se 1.49 0.47 0.17 47.01 1.38 $CV.min$ 18.57 3.81 0.71 78.45 16.48 $sd(\mu)/\sigma = 1$ AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 $Oracle : 10$ CV.1se 0.18 0.05 0.04 49.01 0.5 $CV.min$ 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AICc 5.68 42.76 56.51 20.96 $\rho = 0$ AIC 115.05 92.49 70.28 96.17 $Oracle : 10$ BIC 113.84 90.98 68.77 95.54 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.06 0.02 49.06 0.49 $Oracle : 10$ CV.1se 0.13 0.72 0.22 82.87 6.86 $oracle : 10$ AIC 115.25 93.32 70.79 96.45 $oracle : 10$ BIC 113.97 91.47 69.17 95.78 $oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $oracle : 10$ CV.1se 0.32 0.09 0.02 47.14 0.5 $oracle : 10$ AIC 15.32 93.22 70.92 96.26 $oracle : 10$ AIC 115.32 93.22 70.99 96.26	AIC	113.55	95.31	73.21	93.9		,
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	112.09	93.71	71.35	93.02		Oracle: 10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	1.49	0.47	0.17		1.38	
AICc 9.44 22.28 54.36 24.04 $\rho = 0.9$ AIC 113.62 95.64 73.58 93.83 $\rho = 0.9$ BIC 112.03 93.96 72.05 92.8 $\rho = 0.9$ CV.1se 0.18 0.05 0.04 49.01 0.5 CV.min 7.3 0.76 0.22 82.27 7.55 $\rho = 0.5$ AICc 5.68 42.76 56.51 20.96 $\rho = 0.5$ AIC 115.05 92.49 70.28 96.17 $\rho = 0.5$ BIC 113.84 90.98 68.77 95.54 $\rho = 0.5$ CV.1se 0.13 0.06 0.02 49.06 0.49 CV.min 7.18 0.72 0.22 82.87 6.86 $\rho = 0.5$ AICc 5.32 41.42 56.52 20.47 $\rho = 0.5$ AIC 115.25 93.32 70.79 96.45 BIC 113.97 91.47 69.17 95.78 $\rho = 0.5$ CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $\rho = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26				0.71			$\operatorname{sd}(\mu)/\sigma = 1$
AIC 113.62 95.64 73.58 93.83 $Oracle: 10$							
BIC 112.03 93.96 72.05 92.8 CV.1se 0.18 0.05 0.04 49.01 0.5 CV.min 7.3 0.76 0.22 82.27 7.55 $sd(\mu)/\sigma = 0.5$ AICc 5.68 42.76 56.51 20.96 $\rho = 0$ AIC 115.05 92.49 70.28 96.17 BIC 113.84 90.98 68.77 95.54 CV.1se 0.13 0.06 0.02 49.06 0.49 CV.min 7.18 0.72 0.22 82.87 6.86 $sd(\mu)/\sigma = 0.5$ AICc 5.32 41.42 56.52 20.47 $\rho = 0.5$ AIC 115.25 93.32 70.79 96.45 0racle: 10 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AIC 5.56 41.04 56.52 21.18 $\rho = 0.9$,
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							Oracle: 10
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AICc 5.68 42.76 56.51 20.96 $\rho = 0$ AIC 115.05 92.49 70.28 96.17 BIC 113.84 90.98 68.77 95.54 $\rho = 0$ CV.1se 0.13 0.06 0.02 49.06 0.49 CV.min 7.18 0.72 0.22 82.87 6.86 $sd(\mu)/\sigma = 0.5$ AICc 5.32 41.42 56.52 20.47 $\rho = 0.5$ AIC 115.25 93.32 70.79 96.45 BIC 113.97 91.47 69.17 95.78 $\rho = 0.5$ CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26							$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 115.05 92.49 70.28 96.17 $Oracle: 10$. , , ,
BIC 113.84 90.98 68.77 95.54 Oracle: 10 CV.1se 0.13 0.06 0.02 49.06 0.49 CV.min 7.18 0.72 0.22 82.87 6.86 $sd(\mu)/\sigma = 0.5$ AICc 5.32 41.42 56.52 20.47 $\rho = 0.5$ AIC 115.25 93.32 70.79 96.45 Oracle: 10 BIC 113.97 91.47 69.17 95.78 Oracle: 10 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26 Oracle: 10							,
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							Oracle: 10
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						0.49	
AICc 5.32 41.42 56.52 20.47 $\rho = 0.5$ AIC 115.25 93.32 70.79 96.45 BIC 113.97 91.47 69.17 95.78 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26							$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 115.25 93.32 70.79 96.45 BIC 113.97 91.47 69.17 95.78 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26							\' / /
BIC 113.97 91.47 69.17 95.78 Oracle: 10 CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26 Oracle: 10							,
CV.1se 0.32 0.09 0.02 47.14 0.5 CV.min 7.87 0.81 0.21 81.23 7.48 $sd(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26							Oracle: 10
CV.min 7.87 0.81 0.21 81.23 7.48 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26						0.5	
AICc 5.56 41.04 56.52 21.18 $\rho = 0.9$ AIC 115.32 93.22 70.92 96.26							$\int \operatorname{sd}(\mu)/\sigma = 0.5$
AIC 115.32 93.22 70.92 96.26							(1 / /
\perp $IIracle: 111$							-
							Oracle: 10

Table 87: Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}~\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	14.5	10.37	4.59	34.35	9.08	
CV.min	48.76	30.49	9.09	62.24	25.12	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	23.63	12.69	40.4	27.3		$\rho = 0$
AIC	107.21	95.86	73.11	82.84		Oracle: 10
BIC	105.59	94.62	71.98	68.72		Oracic : 10
CV.1se	1.85	2.03	0.98	34.6	2.43	
CV.min	18.64	13.43	2.57	67.88	10.97	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	11.48	3.33	32.98	21.77		$\rho = 0.5$
AIC	108.62	99.01	78.58	86.94		Oracle: 10
BIC	107.48	98.11	77.47	69.36		Oracic . 10
CV.1se	1.87	1.57	1.21	14.26	1.38	
CV.min	12.42	8.94	2.65	35.64	4.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	9.63	2.13	1.09	20.56		$\rho = 0.9$
AIC	103.72	94.2	74.92	59.68		Oracle: 10
BIC	96.42	91.4	74.17	4.16		Oracie: 10
CV.1se	2.32	1.23	0.47	42.95	1.56	
CV.min	21.01	7.68	1.51	75.87	17.68	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	12.34	2.64	52.92	22.95		$\rho = 0$
AIC	112.42	97.36	75.51	91.96		0 1 10
BIC	110.69	96.1	73.51	89.39		Oracle:10
CV.1se	0.65	0.47	0.24	37.69	0.66	
CV.min	10.16	4.68	1	71.7	7.12	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	7.91	1.19	49.4	20.47		$\rho = 0.5$
AIC	112.63	100.66	80.45	92.43		, , , , ,
BIC	110.97	99.28	79.02	88.18		Oracle: 10
CV.1se	1.08	1.02	0.88	8.06	0.92	
CV.min	9.12	6.35	1.86	27.66	4.02	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	8.21	1.51	1.5	14.76		$\rho = 0.9$
AIC	108.8	96.79	77.68	77.15		,
BIC	107.12	96.28	76.8	6.57		Oracle:10
CV.1se	0.43	0.1	0.04	47.17	0.53	
CV.min	7.26	1.51	0.35	81.57	7.12	$sd(\mu)/\sigma = 0.5$
AICc	6.04	5.46	56.14	20.48		$\rho = 0$
AIC	114.91	96.23	74.15	96.17		,
BIC	113.8	95.08	71.87	95.47		Oracle:10
CV.1se	0.19	0.1	0.03	40.1	0.4	
CV.min	6.2	1.96	0.33	73.69	5.92	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.5	0.51	54.56	19.49	3.72	$\rho = 0.5$
AIC	115.31	99.61	78.56	95.89		
BIC	113.74	98.17	76.53	94.87		Oracle:10
CV.1se	0.27	0.21	0.13	8.65	0.47	
CV.13C	6.07	3.78	0.76	29.34	4.84	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	6.02	0.53	39.04	15.1	1.07	$\rho = 0.9$
AIC	114.26	98.77	79.84	91.25		
BIC	113.21	98.77	78.81	40.59		Oracle: 10
БІС	113.41	70.20	/0.01	40.33		

Table 88: Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$,	marginal AL	sparsenet MCP	
CV.1se	15.25	9.84	2.94	38.53	12.86	
CV.min	52.29	29.7	7.84	65.99	41.23	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.49	14.18	48.45	29.4		$\rho = 0$
AIC	108.91	94.44	71.11	85.89		Oracle: 10
BIC	107.15	93.03	69.96	79.75		Oracic . 10
CV.1se	1.13	0.83	0.32	38.6	1.18	
CV.min	15.96	7.85	1.36	71.45	12.66	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	10.31	2.05	51.43	22.39		$\rho = 0.5$
AIC	111.75	99.46	78.84	91.86		Oracle: 10
BIC	110.21	98.12	77.3	88.77		Oracie . 10
CV.1se	2.94	2.39	1.55	11.52	1.8	
CV.min	17.32	11.96	3.39	31.45	5.82	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	12.15	2.92	4.24	17.22		$\rho = 0.9$
AIC	110.52	98.92	79.39	82.52		0 1 10
BIC	109.06	98.51	78.52	16.99		Oracle: 10
CV.1se	1.89	0.68	0.22	45.26	1.47	
CV.min	20.44	4.87	1	77.64	19.27	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.4	3.98	55.05	23.7		$\rho = 0$
AIC	112.93	95.4	72.56	93.21		,
BIC	111.49	93.86	71.14	92.01		Oracle:10
CV.1se	0.47	0.15	0.09	40.29	0.5	
CV.min	8.63	3.06	0.5	73.88	8.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.57	1.17	53.49	20.6	0.11	$\rho = 0.5$
AIC	114.17	99.81	78.69	94.66		,
BIC	112.51	98.2	76.7	92.95		Oracle:10
CV.1se	0.92	0.75	0.43	10.91	0.9	
CV.13c	10.64	7.1	1.62	31.65	6.78	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	8.71	1.03	22.63	16.97	0.76	$\rho = 0.9$
AICC	113.45	99.75	80.37	89.73		,
BIC	112.3	99.73	79.27	36.91		Oracle:10
CV.1se	0.45	0.08	0.04	47.64	0.51	
CV.1se CV.min	7.27	1.09	0.04	83.01	6.88	$sd(\mu)/\sigma = 0.5$
AICc	5.88	21.4	57.22	20.57	0.66	$\begin{array}{c c} \operatorname{sd}(\mu)/\sigma = 0.3 \\ \rho = 0 \end{array}$
AICC	115.22	93.22	70.71	96.37		$\rho = 0$
BIC			69.19	96.37 95.75		Oracle:10
CV.1se	113.89	91.61			0.38	
	0.16		0.01	40.62		-1()/- 0.5
CV.min	5.75	1.27	0.24	74.63	5.47	$sd(\mu)/\sigma = 0.5$
AICc	4.8	2.44	56.44	19.2		$\rho = 0.5$
AIC	115.48	97.16	75.46	96.22		Oracle:10
BIC	113.75	95.41	73.34	95.56	0.41	
CV.1se	0.23	0.1	0.04	9.17	0.41	1/)/ 0.7
CV.min	5.11	2.47	0.36	30.21	4.47	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.77	0.2	59.58	14.71		$\rho = 0.9$
AIC	115.51	97.78	79.39	93.86		Oracle: 10
BIC	114.51	97.09	77.93	56.05		

Table 89: Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	15.3	9.46	2.79	38.84	13.15	
CV.min	52.74	28.67	7.57	66.14	40.88	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.79	14.25	49.58	29.74		$\rho = 0$
AIC	109.07	94.06	70.86	85.87		Oracle:10
BIC	107.23	92.67	69.57	80.39		Oracie. 10
CV.1se	1.15	0.8	0.29	38.82	1.13	
CV.min	15.67	7.55	1.3	71.88	12.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	9.99	2.09	51.75	22.65		$\rho = 0.5$
AIC	111.92	99.41	78.36	92.07		Oracle: 10
BIC	110.3	97.87	76.79	88.34		Oracie: 10
CV.1se	3.02	2.37	1.53	11.41	1.84	
CV.min	17.58	11.65	3.21	30.64	6.05	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	12.44	2.96	4.2	17.48		$\rho = 0.9$
AIC	111.28	99.27	79.3	84.13		Oracle: 10
BIC	110.01	98.5	78.44	19.56		Oracie: 10
CV.1se	1.85	0.68	0.25	45.32	1.5	
CV.min	20.34	4.69	0.94	77.91	19.42	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.35	4.96	55.5	23.71		$\rho = 0$
AIC	112.88	94.53	72.26	93.26		0 1 10
BIC	111.39	93.22	70.86	92.15		Oracle: 10
CV.1se	0.49	0.15	0.09	40.63	0.55	
CV.min	8.72	2.83	0.49	74.05	7.92	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.7	1.08	54.75	20.91		$\rho = 0.5$
AIC	114.18	99.19	78.32	94.66		0 1 10
BIC	112.37	97.6	76.47	93.35		Oracle: 10
CV.1se	0.93	0.75	0.41	11.31	0.92	
CV.min	10.6	6.93	1.59	31.92	6.93	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	8.87	1	28.15	17.33		$\rho = 0.9$
AIC	113.67	99.58	80.42	90.31		
BIC	112.6	98.96	79.3	38.44		Oracle: 10
CV.1se	0.39	0.09	0.03	47.88	0.51	
CV.min	7.02	0.94	0.22	83.05	6.92	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	6.03	23.93	58.01	20.39		$\rho = 0$
AIC	115.14	92.72	70.33	96.45		
BIC	113.9	91.32	68.77	95.84		Oracle: 10
CV.1se	0.15	0.05	0.01	40.56	0.39	
CV.min	5.64	1.13	0.24	74.59	5.6	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.77	3.34	56.58	18.98		$\rho = 0.5$
AIC	115.38	96.69	74.79	96.22		
BIC	113.88	95.01	72.91	95.49		Oracle: 10
CV.1se	0.22	0.09	0.05	9.07	0.39	
CV.min	4.92	2.39	0.35	30.14	4.48	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.99	0.18	60.35	14.89		$\rho = 0.9$
AIC	115.45	97.52	79.08	94.04		
BIC	114.32	96.92	77.76	56.09		Oracle:10
	111102	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				

Table 90: Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	15.21	9.35	2.77	38.82	13.47	
CV.min	52.82	28.65	7.41	66.02	41.77	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	25.42	14.14	50.04	29.98		$\rho = 0$
AIC	109.08	93.8	70.69	85.97		Oracle: 10
BIC	107.32	92.37	69.39	80.36		Oracie. 10
CV.1se	1.17	0.96	0.3	38.95	1.11	
CV.min	15.91	7.53	1.25	71.91	12.68	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	10.01	1.97	50.99	22.59		$\rho = 0.5$
AIC	111.92	99.13	78.16	92.24		Oracle: 10
BIC	110.31	97.63	76.44	88.11		Oracle: 10
CV.1se	3.06	2.36	1.54	11.34	1.82	
CV.min	17.76	11.56	3.37	30.47	6.11	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	12.36	2.97	5.95	17.28		$\rho = 0.9$
AIC	111.5	99.3	79.39	84.64		Omasla . 10
BIC	110.17	98.8	78.55	21.46		Oracle: 10
CV.1se	1.82	0.61	0.24	45.25	1.42	
CV.min	20.17	4.57	1.05	77.66	19.06	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	11.37	5.38	55.83	23.62		$\rho = 0$
AIC	112.97	94.51	71.98	93.3		,
BIC	111.61	93.11	70.39	91.94		Oracle: 10
CV.1se	0.45	0.14	0.09	40.74	0.56	
CV.min	8.58	2.68	0.51	74.03	7.9	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	6.68	1.07	54.68	20.64		$\rho = 0.5$
AIC	114.12	99.09	78	94.62		,
BIC	112.63	97.48	75.92	93.32		Oracle: 10
CV.1se	0.95	0.75	0.38	11.42	0.88	
CV.min	10.38	6.89	1.56	31.8	6.94	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	8.91	0.97	29.77	17.51		$\rho = 0.9$
AIC	113.75	99.3	80.23	90.54		,
BIC	112.62	98.61	78.95	40.24		Oracle: 10
CV.1se	0.4	0.09	0.03	47.72	0.52	
CV.min	7.16	0.87	0.23	83.11	6.8	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	5.98	25.61	57.58	20.44		$\rho = 0$
AIC	115.19	92.21	69.93	96.41		,
BIC	114	90.72	68.56	95.8		Oracle: 10
CV.1se	0.14	0.05	0.02	40.55	0.38	
CV.min	5.73	1.12	0.24	74.35	5.55	$sd(\mu)/\sigma = 0.5$
AICc	4.63	3.95	56.76	19.17		$\rho = 0.5$
AIC	115.4	96.71	74.93	96.33		,
BIC	113.69	95.06	72.93	95.62		Oracle:10
CV.1se	0.23	0.09	0.04	9.02	0.38	
CV.rise CV.min	4.93	2.29	0.36	30.16	4.45	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	4.92	0.19	60.41	14.85		$\rho = 0.9$
AIC	115.49	97.2	79.11	94.12		
BIC	113.49	96.64	77.64	54.99		Oracle:10
	117,77	70.04	77.04	27.22		

Table 91: Nonzero coefficients at n=1000, binary design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	40.29	30.26	20.06	28.88	18.91	
CV.min	103.86	78.52	31.82	53.4	32.61	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	98.7	77.59	49.32	50.55		$\rho = 0$
AIC	610.28	607.78	579.95	51.89		<i>Oracle</i> : 33.33
BIC	30.26	26.24	20.04	25.37		Oracie . 33.33
CV.1se	44.17	32.54	20.14	30.83	18.92	
CV.min	111.63	84.28	33.09	55.46	32.41	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	104.35	81.41	52.45	52.7		$\rho = 0.5$
AIC	610.41	607.82	581.21	53.96		Oracle: 33.31
BIC	30.89	26.5	20	25.76		Oracie . 55.51
CV.1se	46.46	33.38	20.35	31.05	18.88	
CV.min	114.78	86.83	34.4	55.02	33.29	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	106.32	82.36	52.01	52.52		$\rho = 0.9$
AIC	603.04	600.74	573.89	53.5		Oracle: 33.07
BIC	31.48	26.8	19.88	26.37		Oracie: 33.07
CV.1se	24.04	17.97	12.28	37.57	11.93	
CV.min	77.63	53.9	19.1	115.49	26.51	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	79.62	59.8	48.82	98.15		$\rho = 0$
AIC	741.05	735.09	706.78	151.85		0 1 2624
BIC	19.81	16.69	11.64	18.04		<i>Oracle</i> : 26.34
CV.1se	25.49	18.63	12.2	40.99	11.94	
CV.min	82.84	57.87	18.8	119.47	24.93	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	83.24	62.61	48.16	98.94		$\rho = 0.5$
AIC	742.59	736.48	708.61	158.24		,
BIC	19.78	16.56	11.67	18.13		<i>Oracle</i> : 26.43
CV.1se	27.1	19.2	12.26	40.54	11.86	
CV.min	85.99	60.35	19.91	114.82	25.63	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	85.41	64.03	48.92	100.32		$\rho = 0.9$
AIC	736.9	730.77	702.45	151.49		,
BIC	19.93	16.69	11.48	18.45		<i>Oracle</i> : 26.14
CV.1se	8.77	6.95	4.92	41.55	5.06	
CV.min	47.87	28.53	9.83	139.79	22.76	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	57.57	39.53	39.22	105.73		$\rho = 0$
AIC	829.32	820.64	811.42	314.03		,
BIC	8.92	7.28	3.28	10.28		<i>Oracle</i> : 19.71
CV.1se	8.77	7	4.8	45.41	4.88	
CV.min	50.91	31.32	9.68	143.08	20.9	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	59.87	43.09	41.37	105.96		$\rho = 0.5$
AIC	831.55	823.04	812.95	319.27		,
BIC	8.23	6.88	3.21	9.9		<i>Oracle</i> : 19.37
CV.1se	9.12	7.02	4.69	43.14	4.97	
CV.min	53.04	33.09	9.76	136.65	20.59	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	60.92	42.57	42.85	105.45		$\rho = 0.9$
AIC	827.65	819.44	809.05	303.68		,
BIC	8.01	6.63	3.13	9.99		<i>Oracle</i> : 19.73
	5.01	0.05	5.15	7.77		

Table 92: Nonzero coefficients at n=1000, binary design, dense covariates, and decay 50.

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
AICc 219.14 186.37 173.07 187.93 $\rho = 0$ AIC 746.18 738.06 708.24 255.23 BIC 93.41 79.6 59.12 85.74 CV.1se 198.73 146.75 74.36 154.43 88.12 CV.min 305.62 236.71 102.89 223.18 151.13 $\operatorname{sd}(\mu)/\sigma = 2$ AICc 225.69 192.07 173.83 196.54 $\rho = 0.5$ AIC 751.72 743.47 714.42 268.57 BIC 91.97 79.48 58.92 86.63 CV.1se 205.35 151.83 76.5 155.42 90.38
AIC 746.18 738.06 708.24 255.23 Oracle: 124.19 BIC 93.41 79.6 59.12 85.74 Oracle: 124.19 CV.1se 198.73 146.75 74.36 154.43 88.12 CV.min 305.62 236.71 102.89 223.18 151.13 sd(μ)/σ = 2 AICc 225.69 192.07 173.83 196.54 $\rho = 0.5$ AIC 751.72 743.47 714.42 268.57 Oracle: 123.77 BIC 91.97 79.48 58.92 86.63 Oracle: 123.77 CV.1se 205.35 151.83 76.5 155.42 90.38
BIC 93.41 79.6 59.12 85.74 Oracle: 124.19 CV.1se 198.73 146.75 74.36 154.43 88.12 CV.min 305.62 236.71 102.89 223.18 151.13 $sd(\mu)/\sigma = 2$ AICc 225.69 192.07 173.83 196.54 $\rho = 0.5$ AIC 751.72 743.47 714.42 268.57 Oracle: 123.77 BIC 91.97 79.48 58.92 86.63 Oracle: 123.77 CV.1se 205.35 151.83 76.5 155.42 90.38
BIC 93.41 79.6 59.12 85.74 CV.1se 198.73 146.75 74.36 154.43 88.12 CV.min 305.62 236.71 102.89 223.18 151.13 $sd(\mu)/\sigma = 2$ AICc 225.69 192.07 173.83 196.54 $\rho = 0.5$ AIC 751.72 743.47 714.42 268.57 Oracle: 123.77 BIC 91.97 79.48 58.92 86.63 Oracle: 123.77 CV.1se 205.35 151.83 76.5 155.42 90.38
CV.min 305.62 236.71 102.89 223.18 151.13 $sd(\mu)/\sigma = 2$ AICc 225.69 192.07 173.83 196.54 $\rho = 0.5$ AIC 751.72 743.47 714.42 268.57 Oracle: 123.77 BIC 91.97 79.48 58.92 86.63 07acle: 123.77 CV.1se 205.35 151.83 76.5 155.42 90.38
AICc 225.69 192.07 173.83 196.54 $\rho = 0.5$ AIC 751.72 743.47 714.42 268.57 Oracle: 123.77 BIC 91.97 79.48 58.92 86.63 Oracle: 123.77 CV.1se 205.35 151.83 76.5 155.42 90.38
AIC 751.72 743.47 714.42 268.57 BIC 91.97 79.48 58.92 86.63 CV.1se 205.35 151.83 76.5 155.42 90.38
BIC 91.97 79.48 58.92 86.63 Oracle: 123.77 CV.1se 205.35 151.83 76.5 155.42 90.38
CV.1se 205.35 151.83 76.5 155.42 90.38
CV.min 310.8 240.87 106.84 222.72 154.28 $sd(\mu)/\sigma = 2$
AICc 229.17 195.05 174.06 196.76 $\rho = 0.9$
AIC 748.26 740.18 711.04 267.17 Oracle: 123.58
BIC 93.14 79.97 59.82 88.14
CV.1se 93.86 62.93 32.51 119.46 63.86
CV.min 192.97 130.58 51.98 203.89 153.25 $\operatorname{sd}(\mu)/\sigma = 1$
AICc 158.06 135.07 182.65 166.58 $\rho = 0$
AIC 824.28 813.34 804.09 356.82
BIC 24.33 27.67 10.73 40.98 Oracle: 90.22
CV.1se 97.87 66 32.8 126.4 57.39
CV.min 202.76 137.52 52.74 209.57 142.98 $sd(\mu)/\sigma = 1$
AICc 162.27 138.56 181.45 173.6 $\rho = 0.5$
AIC 827.91 817.81 807.78 371.71
BIC 17.21 24.66 10.35 38.9 Oracle: 90.23
CV.1se 102.12 68.89 32.98 126.27 59.9
CV.min 205.75 143.69 54.71 207.26 145.74 $sd(\mu)/\sigma = 1$
AICc 163.21 141.64 181.46 175.05 $\rho = 0.9$
AIC 825.37 814.97 803.91 365.56
BIC 15.59 23.61 9.46 38.24 Oracle: 89.22
CV.1se 4.84 1.78 0.27 76.42 3.58
CV.min 67.74 22.94 3.4 182.61 $\operatorname{sd}(\mu)/\sigma = 0.5$
AICc 73.42 78.11 61.22 134.75 $\rho = 0$
AIC 873.7 862.77 873.73 462.82
BIC 0.44 0.51 0 2.68 Oracle: 56.16
CV.1se 3.35 1.25 0.14 79.35 2.72
CV.min 61.22 21.26 2.7 184.1 58.35 $\operatorname{sd}(\mu)/\sigma = 0.5$
AICc 69.75 75.45 78.41 136.51 $\rho = 0.5$
AIC 874.96 864.43 874.21 477.01
BIC 0.27 0.29 0 2.05 Oracle: 56.21
CV.1se 3.16 1.02 0.17 76.28 1.82
CV.min 62.94 22.13 2.83 179.17 59.51 $sd(\mu)/\sigma = 0.5$
AICc 71.97 76.23 66.45 134.42 $\rho = 0.9$
AIC 872.60 862.02 872.35 471.88
BIC 0.27 0.33 0 1.82 Oracle: 56.5

Table 93: Nonzero coefficients at n=1000, binary design, dense covariates, and decay 100.

CV.1se 294.74 224.66 128.15 228 238.61 CV.min 408.34 325.49 175.48 300.71 364.97 $sd(\mu)/\sigma =$ AICc 283.24 251.72 253.6 252.77 $\rho =$ AIC 788.18 776.49 752.2 369.07 DISC 46.61 97.42 90.46 100.75	= 0
AICc 283.24 251.72 253.6 252.77 $\rho = \frac{1}{2}$	= 0
AIC 788 18 776 40 752 2 360 07	
AIC 788.18 776.49 752.2 369.07	.71
	. / 1
BIC 46.61 87.42 98.48 108.5	
CV.1se 305.57 235.05 129.77 235.3 226.11	
CV.min 421.3 339.42 181.28 308.14 350.87 $\operatorname{sd}(\mu)/\sigma =$	= 2
AICc 289.92 258.65 252.81 259.51 $\rho = 0$	0.5
AIC 792.48 780.96 756.95 381.33 Oracle: 208.7	70
BIC 22.87 81.48 100.23 103.41	.19
CV.1se 311.09 238.15 134.29 234.09 232	
CV.min 425.03 341.01 187.11 307.37 356.24 $\operatorname{sd}(\mu)/\sigma =$	= 2
AICc 291.91 259.85 252.12 258.04 $\rho = 0$	0.9
AIC 790.06 779.16 754.31 381.4 Oracle: 209.4	12
BIC 17.89 78.71 103.31 100.59	.43
CV.1se 117.97 66.72 16.48 162.68 114	
CV.min 242.29 150.86 44.91 252.26 244.73 $\operatorname{sd}(\mu)/\sigma =$	= 1
AICc 180.21 169.95 232.87 199.96 $\rho =$	
AIC 845.94 833.3 832.89 447.23	25
BIC 0.76 2.67 0.19 13.48 Oracle: 143.2	.25
CV.1se 115.95 65.9 13.95 167.65 110.69	
CV.min 248.62 157.09 41.49 256.44 248.62 $\operatorname{sd}(\mu)/\sigma =$	= 1
AICc 180.51 173.18 234.91 204.3 $\rho = 0$	
AIC 848.75 836.24 834.17 457.89	4.4
BIC 0.66 1.65 0.03 9.28 Oracle : 14	44
CV.1se 118.78 69.51 12.47 166.55 110.96	
CV.min 251.2 160.55 41.95 252.97 249.02 $\operatorname{sd}(\mu)/\sigma =$	= 1
AICc 179.73 174.42 236.68 205.2 $\rho = 0$	
AIC 846 39 833 79 831 4 457 58	
BIC 0.45 1.24 0.13 8.69 Oracle: 143	3.6
CV.1se 1.75 0.14 0.03 81.17 1.44	
CV.min 50.5 7.13 1.01 194.17 52.22 $\operatorname{sd}(\mu)/\sigma = 0$	0.5
AICc 61.46 92.2 42.85 137.24 $\rho =$	
AIC 881.85 869.79 887.57 510.94	
BIC 0.11 0.05 0 0.89 Oracle: 77.9	.92
CV.1se 1.26 0.12 0.02 82.25 1.08	
CV.min 41.82 6.08 0.75 193.11 39.59 $\operatorname{sd}(\mu)/\sigma = 0$	0.5
AICc 53.43 85.17 50.76 138.06 $\rho = 0$	
AIC 882 18 871 13 887 71 523 07	
BIC 0.08 0.04 0 0.8 Oracle : 78.0	.04
CV.1se 0.77 0.12 0.01 77.97 0.72	
CV.min 40.83 5.28 0.77 188.83 39.76 $sd(\mu)/\sigma = 0$	0.5
AICc 54.18 85.55 46.09 134.93 $\rho = 0$	
AIC 880.12 868.15 885.31 516.08	
BIC 0.1 0.06 0 0.69 Oracle: 77	1.5

Table 94: Nonzero coefficients at n=1000, binary design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	383.94	283.47	150.44	298.63	405.93	
CV.min	511.85	408.4	245.72	379.06	544.93	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	309.75	297.8	336.43	300.16		$\rho = 0$
AIC	821.08	804.86	787.57	470.44		Oracle : 293.07
BIC	0.35	1.58	98.03	13.45		01466.293.01
CV.1se	386.54	288.5	148.59	299.91	407.31	
CV.min	519.75	416.18	245.95	379.94	555.02	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	308.44	301.81	337.2	301.94		$\rho = 0.5$
AIC	825.11	809.5	790.08	477.91		Oracle: 293.71
BIC	0.33	0.69	81.75	8.08		Oracie : 293.71
CV.1se	394	292.04	145.63	296.62	412.44	
CV.min	524.47	420.01	245.65	378.06	560.97	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	310.24	301.48	337.78	297.73		$\rho = 0.9$
AIC	822.44	806.85	788.27	478.03		0 1 202.26
BIC	0.31	0.75	77.53	6.91		Oracle: 293.26
CV.1se	99.77	23.82	0.51	186.02	105.59	
CV.min	259.46	100.91	5.01	285.17	263.4	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	167.62	192.74	279.62	211.05		$\rho = 0$
AIC	859.47	844.17	852.09	513.5		•
BIC	0.17	0.12	0	2.08		Oracle : 216.99
CV.1se	82.81	14.43	0.27	187.17	85.67	
CV.min	249.8	85.88	3.7	286.65	254.83	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	156.61	191.14	283.4	211.14		$\rho = 0.5$
AIC	861.78	846.79	852.79	520.13		,
BIC	0.14	0.12	0	1.62		Oracle: 214.81
CV.1se	82.72	16.1	0.28	181.5	83.58	
CV.nse	249.18	91.76	3.45	279.84	253.07	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	158.92	189.29	279.88	210.19	233.07	$\rho = 0.9$
AIC	859.39	844.07	850.26	519.86		,
BIC	0.14	0.08	0	1.45		<i>Oracle</i> : 215.03
CV.1se	0.7	0.01	0.01	81.98	0.76	
CV.13C CV.min	36.36	2.03	0.47	198.47	36.68	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	46.73	112.57	22.42	139.26	30.00	$\rho = 0$
AIC	885.63	873.54	896.81	537.14		•
BIC	0.07	0.01	23.29	0.52		Oracle:90.72
CV.1se	0.69	0.01	0	80.73	0.67	
CV.13C CV.min	29.29	1.66	0.39	197.07	27.85	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	37.82	101.97	23.89	137.07	27.63	$\rho = 0.5$
AICC	885.94	874.09	896.62	543		$\rho = 0.5$
BIC		0.01		0.42		<i>Oracle</i> : 91.39
	0.05		5.37		0.56	
CV.1se	0.18	0.01	0.01	74.07	0.56	ad()/- 0.5
CV.min	27.58	1.41	0.33	189.77	25.25	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	38.09	99.59	23.41	134.13		$\rho = 0.9$
AIC	883.15	871.17	893.98	538.49		Oracle: 89.48
BIC	0.06	0.01	6.28	0.45		

Table 95: Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	40.23	30.77	20.09	29.14	18.78	
CV.min	103.76	78.8	31.81	53.81	32.47	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	98.46	71.29	25.58	50.62		$\rho = 0$
AIC	609.88	607.64	580.35	51.92		Oracle : 33.25
BIC	30.07	25.32	18.57	25.45		07 acic . 33.23
CV.1se	85.95	59.01	22.88	35.13	18.98	
CV.min	173.58	132.96	51.72	45.41	30.13	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	146.22	111.74	45.27	45.18		$\rho = 0.5$
AIC	539.76	539.6	515.24	45.28		Oracle : 32.89
BIC	39.09	29.4	16.72	34.08		Oracie . 32.89
CV.1se	150.02	120.25	60.25	11.45	32.54	
CV.min	226.55	191.62	98.54	12.54	58.04	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	190.68	160.9	82.9	12.54		$\rho = 0.9$
AIC	243	239.05	197.57	12.54		Oracle : 30.44
BIC	71.07	57.39	20.73	12.46		Oracie: 30.44
CV.1se	24.05	18.18	12.51	38.68	11.99	
CV.min	77.57	53.9	19.19	117.71	25.94	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	79.04	49.77	13.8	97.49		$\rho = 0$
AIC	741.44	735.3	707.14	154.26		0 1 26 10
BIC	19.89	15.73	10.19	18.04		<i>Oracle</i> : 26.18
CV.1se	45.8	31.51	12.76	65.94	12.36	
CV.min	125.9	93.68	28.08	125.17	23.86	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	115.44	82.27	24.26	112.66		$\rho = 0.5$
AIC	688.78	684	652.99	129.65		,
BIC	19.86	15.23	8.09	24.1		<i>Oracle</i> : 25.84
CV.1se	62.36	64.82	38.31	15.39	24.64	
CV.min	158.96	137.62	66.45	26.62	50.78	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	141.65	114.83	50.41	26.15		$\rho = 0.9$
AIC	377.88	388.6	358.26	26.24		,
BIC	1.36	1.04	1.11	15.95		<i>Oracle</i> : 23.28
CV.1se	8.8	7	4.92	44.83	5.08	
CV.min	48.52	28.86	9.74	141.58	21.95	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	56.72	24.17	4.06	106.35		$\rho = 0$
AIC	829.75	821.38	811.62	313.25		,
BIC	8.98	6.23	1.63	10.14		<i>Oracle</i> : 19.21
CV.1se	4.39	5.4	3.2	52.64	5.18	
CV.min	56.57	45.85	11.03	139.38	16.07	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	66.87	38.72	2.97	114.28		$\rho = 0.5$
AIC	798.28	790.49	773.39	252.81		,
BIC	2.44	1.77	0.96	3.45		Oracle: 18.97
CV.1se	1.01	1	1	12.12	1.22	
CV.rise CV.min	6.89	5.06	2.4	56.98	10.16	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	12.86	1.84	1	55.73	10.10	$\rho = 0.9$
AIC	533.45	552.92	519.96	64.96		,
BIC	1.36	1.03	1	2.65		<i>Oracle</i> : 16.45
DIC	1.50	1.03	1	2.03		

Table 96: Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$		marginal AL	sparsenet MCP	
CV.1se	189.31	139.46	73.87	147.15	91	
CV.min	294.18	225.93	100.33	214.59	157.98	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	219.73	179.51	129.5	189.09		$\rho = 0$
AIC	744.98	736.27	707.21	254.54		Oracle: 122.78
BIC	92.2	75.5	52.55	86.25		Oracic . 122.76
CV.1se	286.64	223.7	103.06	201.21	92.9	
CV.min	396.96	324.17	154.11	258.04	140.39	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	282.54	240.41	163.36	234.93		$\rho = 0.5$
AIC	725.19	717.34	686.23	275.34		Oracle : 122.51
BIC	47.23	75.62	59.96	85.34		Oracie . 122.31
CV.1se	343.32	289.56	174.1	48.16	139.93	
CV.min	433.1	383.15	223.99	63.04	179.43	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	321.61	289.37	208.99	62.33		$\rho = 0.9$
AIC	439.84	423.48	377.82	62.64		Omasla , 110 51
BIC	1.5	1.05	1.75	32.92		Oracle: 119.51
CV.1se	94.13	62.87	32.34	120.57	63.43	
CV.min	194.28	130.79	51.03	205.17	151.64	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	156.58	120.05	91.37	165.97		$\rho = 0$
AIC	823.94	812.81	803.32	357		
BIC	24.13	21.07	1.31	40.85		Oracle: 90.22
CV.1se	110.61	97.57	41.36	149.28	57.1	
CV.min	247.13	199.81	77.33	228.2	106.15	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	185.73	162.71	130.64	196.87		$\rho = 0.5$
AIC	813.03	804.22	788.13	382.78		'
BIC	1.29	0.9	0.12	4.35		Oracle: 89.65
CV.1se	13.2	38.87	28.91	46.86	86.02	
CV.min	91.69	148.19	77.18	90.96	136.18	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	66.79	54.07	51.49	87.81		$\rho = 0.9$
AIC	567.7	553.16	511.68	94.55		'
BIC	1.45	1.05	1	3.31		<i>Oracle</i> : 86.22
CV.1se	4.79	1.67	0.21	79.02	3.63	
CV.min	66.4	24.39	3.5	183.81	65.76	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	72.26	28.51	0.32	135.4		$\rho = 0$
AIC	872.68	861.48	872.95	464.25		·
BIC	0.38	0.09	0	2.63		<i>Oracle</i> : 55.94
CV.1se	0.13	0.05	0.01	42.91	0.5	
CV.min	14.64	7.21	0.83	146.94	13.54	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	30.47	3.29	0.45	112.22	13.51	$\rho = 0.5$
AIC	865.25	855.61	859.09	477.54		'
BIC	0.16	0.07	0	0.66		<i>Oracle</i> : 55.62
CV.1se	0.17	0.19	0.27	3.57	0.45	
CV.rise CV.min	7.51	4.62	1.39	50.23	2.88	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	12.82	1.48	0.93	56.12	2.00	$\rho = 0.9$
AIC	694.36	675.13	662.68	99.31		i i
BIC	1.3	1.01	0.72	1.48		Oracle: 52.3
БІС	1.3	1.01	0.72	1.40		

Table 97: Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	295.67	224.76	126.9	227.98	237.94	
CV.min	409.33	324.61	174.62	300.53	365.75	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	283.83	244.32	221.26	252.41		$\rho = 0$
AIC	787.27	775.72	750.87	367.77		Oracle : 209.76
BIC	48.51	76.81	94.48	108.98		07 acre : 207.70
CV.1se	381.43	313.85	185.07	258.75	183.17	
CV.min	502.88	427.02	253.3	342.89	238.47	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	326.77	300.72	247.32	282.31		$\rho = 0.5$
AIC	785.69	775.73	749.02	411.89		Oracle: 209.36
BIC	0.79	0.54	34.18	3.68		07466.207.30
CV.1se	424.02	368.39	247.85	61.94	209.98	
CV.min	534.23	478.03	314.91	110.51	258.8	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	346.23	340.85	289.79	106.08		$\rho = 0.9$
AIC	549.23	528.48	478.09	114.49		Oracle : 205.71
BIC	1.48	1.05	1	2.21		07466.203.71
CV.1se	118.11	65.7	17.56	164.9	113.82	
CV.min	245.02	151.66	45.64	252.48	245.91	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	179.45	152.77	172.19	199.51		$\rho = 0$
AIC	845.22	832.26	831.89	447.16		Oracle: 143.47
BIC	0.88	0.61	0.02	14.12		Oracie: 145.47
CV.1se	22.33	21.53	0.62	140.9	25.15	
CV.min	175.27	122.49	6.11	241.24	130.73	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	123.73	133.25	175.33	191.04		$\rho = 0.5$
AIC	843.24	832.53	824.17	488.75		1 142 47
BIC	0.29	0.12	0	1.27		Oracle: 143.47
CV.1se	0.66	0.68	0.53	21.21	2.22	
CV.min	9.09	8.97	1.55	88.13	14.64	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	16.5	1.8	1.58	92.84		$\rho = 0.9$
AIC	648.45	629.05	596.25	147.76		1 120 45
BIC	1.46	1.04	0.96	1.54		Oracle: 139.45
CV.1se	1.41	0.22	0.01	84.18	1.24	
CV.min	50.87	7.05	0.99	194.69	51.01	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	60.65	15.8	0.77	139.02		$\rho = 0$
AIC	880.93	869.36	887.1	513.59		·
BIC	0.09	0.01	72.43	0.91		<i>Oracle</i> : 77.65
CV.1se	0.03	0.01	0	33.29	0.46	
CV.min	9.02	2.35	0.31	135.51	9.12	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	20.81	0.5	0.54	101.99		$\rho = 0.5$
AIC	871.52	859.96	871.15	515.82		
BIC	0.06	0.01	0	0.35		<i>Oracle</i> : 77.66
CV.1se	0.03	0.04	0.05	0.93	0.44	
CV.min	6.97	4.16	1.25	33.26	4.64	$sd(\mu)/\sigma = 0.5$
AICc	12.79	1.19	0.34	37.12		$\rho = 0.9$
AIC	746.35	724.68	727.14	91.97		·
BIC	0.72	0.56	0.09	1.17		<i>Oracle</i> : 73.55
	-					L

Table 98: Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 200.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
AICc 308.96 290.14 321.3 300.18 $\rho = 0$ AIC 820.4 803.49 785.31 467.88 BIC 0.4 0.13 239.99 13.26 $\rho = 0$ CV.Ise 362.56 272.47 21.94 237.95 337.59 $\rho = 0.0$ CV.min 545.77 453.54 80.12 341.17 570.23 $\rho = 0.0$ AIC 206.92 294.14 346.83 258.82 $\rho = 0.5$ AIC 825.52 811.79 789.99 506.01 $\rho = 0.0$ BIC 0.18 0.06 11.17 1.12 $\rho = 0.0$ CV.min 367.65 299.18 8.68 108.77 236.57 $\rho = 0.0$ AIC 21.03 49.19 373.04 108.62 $\rho = 0.0$ AIC 655.08 630.68 585.9 205.08 BIC 1.43 1.02 0.83 1.57 $\rho = 0.0$ CV.min 262.26 97.96 5.38 285.37 264.16 $\rho = 0.0$ AIC 859.08 842.76 851.85 513.31 $\rho = 0.0$ AIC 859.08 842.76 851.85 513.31 $\rho = 0.0$ CV.min 43.6 11.7 0.7 220.4 43.56 $\rho = 0.0$ AIC 850.78 20.82 92.93 157.62 $\rho = 0.0$ AIC 850.78 20.82 92.93 157.62 $\rho = 0.0$ AIC 850.8 842.84 841.34 536.23 $\rho = 0.0$ CV.min 89.4 5.47 1.44 47.71 5.17 $\rho = 0.0$ AIC 19.13 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ CV.Ise 0.08 0.06 0.12 2.54 0.43 $\rho = 0.0$ AIC 19.13 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.0$ AIC 19.13 695.50 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.0$ CV.Ise 0.54 0.02 0.01 84.71 0.61 $\rho = 0.0$ AIC 885.04 873.33 897.03 543 $\rho = 0.0$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 $\rho = 0.0$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 $\rho = 0.0$ AIC 778.52 754.45 769.48 99.03 $\rho = 0.0$				148.34			
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		514.87				546.18	$\operatorname{sd}(\mu)/\sigma = 2$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				321.3			$\rho = 0$
Signature Si							Oracle : 203 21
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.4		239.99	13.26		Oracie . 293.21
AICc 206.92 294.14 346.83 258.82 $\rho = 0.5$ AIC 825.52 811.79 789.99 506.01 BIC 0.18 0.06 11.17 1.12 $\rho = 0.5$ CV.1se 138.52 113.35 1.64 26.09 58.83 $\rho = 0.9$ AICc 21.03 49.19 373.04 108.62 $\rho = 0.9$ AICc 21.03 49.19 373.04 108.62 $\rho = 0.9$ AIC 655.08 630.68 585.9 205.08 BIC 1.43 1.02 0.83 1.57 $\rho = 0.9$ AIC 1.43 1.02 0.83 1.57 $\rho = 0.9$ AIC 1.44 1.72.26 167.66 211.65 $\rho = 0.9$ AIC 859.08 842.76 851.85 513.31 $\rho = 0.9$ AIC 859.08 842.76 851.85 513.31 $\rho = 0.9$ AIC CV.ise 1.16 0.22 0.01 100.15 0.94 CV.min 43.6 11.7 0.7 220.4 43.56 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 $\rho = 0.5$ AIC 1.51 1.57 0.61 55.82 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.9$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 1.99 0.41 1.99.88 34.32 $\rho = 0.9$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 1.99 0.41 1.99.88 34.32 $\rho = 0.9$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 0 630.51 0.52 $\rho = 0.9$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 0 630.51 0.52 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 BIC 0.07 0 630.51 0.52 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 $\rho = 0.5$ AIC 11.34 0.51 0.04 32.27 $\rho = 0.5$ AIC 11.34 0.51	CV.1se	362.56	272.47		237.95		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min		453.54	80.12	341.17	570.23	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 0.18 0.06 11.17 1.12 Oracle : 293.08 CV.Ise 138.52 113.35 1.64 26.09 58.83 sd(μ)/σ = 2 AICe 21.03 49.19 373.04 108.62 $\rho = 0.9$ AIC 655.08 630.68 585.9 205.08 Oracle : 292.24 CV.1se 100.97 21.71 0.46 188.19 103.56 CV.min 262.26 97.96 5.38 285.37 264.16 sd(μ)/σ = 1 AIC 859.08 842.76 851.85 513.31 Oracle : 215.38 CV.1se 1.16 0.22 0.01 100.15 0.94 CV.1se 1.16 0.22 0.01 100.15 0.94 CV.min 43.6 11.7 0.7 220.4 43.56 sd(μ)/σ = 1 AIC 856.8 842.84 841.34 536.23 Oracle : 215.2 CV.lse 0.08 0.06 0.12 2.54 0.43 CV.min <td>AICc</td> <td>206.92</td> <td>294.14</td> <td>346.83</td> <td>258.82</td> <td></td> <td>$\rho = 0.5$</td>	AICc	206.92	294.14	346.83	258.82		$\rho = 0.5$
BIC 0.18 0.06 11.17 1.12 CV.Isic 138.52 113.35 1.64 26.09 58.83 CV.min 367.65 299.18 8.68 108.77 236.57 $sd(\mu)/\sigma = 2$ AICc 21.03 49.19 373.04 108.62 $\rho = 0.9$ AIC 655.08 630.68 585.9 205.08 Oracle : 292.24 CV.Ise 100.97 21.71 0.46 188.19 103.56 CV.Ise 100.97 21.71 0.46 188.19 103.56 CV.min 262.26 97.96 5.38 285.37 264.16 $sd(\mu)/\sigma = 1$ AIC 164.94 172.26 167.66 211.65 $\rho = 0$ AIC 859.08 842.76 851.85 513.31 Oracle : 215.38 CV.Ise 1.16 0.22 0.01 100.15 0.94 CV.Ise 1.16 0.22 0.01 100.15 0.94 CV.Ise 0.08 0.06		825.52	811.79	789.99	506.01		Oracle : 203.08
$\begin{array}{c} \text{CV.min} & 367.65 \\ \text{AICc} & 21.03 \\ \text{AIC} & 21.03 \\ \text{AIJ} & 49.19 \\ \text{AIS} & 373.04 \\ \text{BIC} & 1.43 \\ \text{I.02} & 0.83 \\ \text{I.57} \\ \text{CV.1se} & 100.97 \\ \text{CV.min} & 262.26 \\ \text{AIC} & 97.96 \\ \text{AIC} & 164.94 \\ \text{I.72.26} & 167.66 \\ \text{AIC} & 164.94 \\ \text{I.72.26} & 167.66 \\ \text{AIC} & 11.65 \\ \text{AIC} & 10.02 \\ \text{CV.min} & 262.26 \\ \text{AIC} & 859.08 \\ \text{A42.76} & 851.85 \\ \text{S13.81} \\ \text{BIC} & 0.21 \\ \text{CV.min} & 43.6 \\ \text{AIC} & 11.7 \\ \text{AIC} & 50.78 \\ \text{AIC} & 20.82 \\ \text{AIC} & 856.8 \\ \text{B42.84} & 841.34 \\ \text{S41.34} & 536.23 \\ \text{BIC} & 0.09 \\ \text{CV.min} & 8.94 \\ \text{CV.min} & 8.94 \\ \text{CV.min} & 8.94 \\ \text{AIC} & 15.13 \\ \text{AIC} & 15.13 \\ \text{AIC} & 1.57 \\ \text{AIC} & 10.02 \\ \text{CV.min} & 36.97 \\ \text{AIC} & 0.78 \\ \text{AIC} & 87.33 \\ \text{AIC} & 87.32 \\ \text{AIC} & 17.52 \\ \text{AIC} & 17.58 \\ \text{CV.1se} & 0.02 \\ \text{O} & 0 & 0.99 \\ \text{AIC} & 17.52 \\ \text{AIC} & 17.52 \\ \text{AIC} & 17.53 \\ \text{AIC} & 17.53 \\ \text{AIC} & 17.52 \\ \text{AIC} & 17.58 \\ \text{AIC} & 17.52 \\ \text{AIC} & 17.58 \\ \text{AIC} & 17.52 \\ \text{AIC} & 17.58 \\ \text{AIC} & 17.59 \\ \text{AIC} & 17.59 \\ \text{AIC} & 17.59 \\ \text{AIC} & 17.59 \\ \text{AIC} & 17$	BIC	0.18	0.06	11.17	1.12		Oracie . 293.00
AICc 21.03 49.19 373.04 108.62 $\rho = 0.9$ AIC 655.08 630.68 585.9 205.08 BIC 1.43 1.02 0.83 1.57 $\rho = 0.9$ CV.1se 100.97 21.71 0.46 188.19 103.56 $\rho = 0.9$ AIC 164.94 172.26 167.66 211.65 $\rho = 0$ AIC 859.08 842.76 851.85 513.31 $\rho = 0.02$ Oracle : 215.38 DIC 0.21 0.02 57.73 2.33 $\rho = 0.01$ 0.01 0.01 0.01 0.49 $\rho = 0.09$ AIC 15.13 1.57 0.61 55.82 $\rho = 0.09$ 0.02 0 0 0.49 $\rho = 0.09$ AIC 15.13 1.57 0.61 55.82 $\rho = 0.09$ AIC 15.13 1.57 0.61 55.82 $\rho = 0.09$ AIC 885.04 873.33 897.03 543 DIC 0.07 0 630.51 0.52 $\rho = 0.09$ AIC 872.97 860.48 877.79 531.04 $\rho = 0.09$ AIC 872.97 860.48 877.79 531.04 $\rho = 0.09$ AIC 872.97 860.48 877.79 531.04 $\rho = 0.09$ AIC 872.97 860.48 877.9 531.04 $\rho = 0.09$ AIC 872.97 860.48 877.9 531.04 $\rho = 0.5$ AIC 872.97 860.48 877.9 531.04 $\rho = 0.5$ AIC 872.97 860.48 877.99 531.04 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 $\rho = 0.5$ AIC 872.97 860.48 877.99 531.04 $\rho = 0.5$ AIC 872.97 860.48 877.99 531.04 $\rho = 0.5$ AIC 872.97	CV.1se	138.52	113.35	1.64	26.09	58.83	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			299.18	8.68	108.77	236.57	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 1.43 1.02 0.83 1.57 Oracle: 292.24 CV.1se 100.97 21.71 0.46 188.19 103.56 $sd(\mu)/\sigma = 1$ CV.min 262.26 97.96 5.38 285.37 264.16 $sd(\mu)/\sigma = 1$ AIC 164.94 172.26 167.66 211.65 $\rho = 0$ AIC 859.08 842.76 851.85 513.31 Dracle: 215.38 CV.1se 1.16 0.22 0.01 100.15 0.94 CV.nse 1.16 0.22 0.01 100.15 0.94 CV.min 43.6 11.7 0.7 220.4 43.56 $sd(\mu)/\sigma = 1$ AIC 856.8 842.84 841.34 536.23 Oracle: 215.2 CV.1se 0.08 0.06 0.12 2.54 0.43 CV.nin 8.94 5.47 1.44 47.71 5.17 $sd(\mu)/\sigma = 1$ AIC 719.38 695.56 676.52 227.69 Oracle: 211.72	AICc	21.03	49.19	373.04	108.62		$\rho = 0.9$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AIC	655.08	630.68	585.9	205.08		Orgalo : 202 24
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	1.43	1.02	0.83	1.57		Oracie : 292.24
AICc 164.94 172.26 167.66 211.65 $\rho = 0$ AIC 859.08 842.76 851.85 513.31 $\rho = 0$ AIC 859.08 842.76 851.85 513.31 $\rho = 0$ CV.1se 1.16 0.22 0.01 100.15 0.94 $\rho = 0$ CV.min 43.6 11.7 0.7 220.4 43.56 $\rho = 0$ AICc 50.78 20.82 92.93 157.62 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 $\rho = 0.5$ BIC 0.09 0.02 0 0 0.49 $\rho = 0.5$ CV.1se 0.08 0.06 0.12 2.54 0.43 $\rho = 0.5$ AIC 15.13 1.57 0.61 55.82 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 $\rho = 0.9$ BIC 1.02 0.78 0.29 1.44 $\rho = 0.5$ CV.1se 0.54 0.02 0.01 84.71 0.61 $\rho = 0.5$ AIC 885.04 873.33 897.03 543 $\rho = 0.5$ AIC 885.04 873.33 897.03 543 $\rho = 0.5$ AIC 885.04 873.33 897.03 543 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 $\rho = 0.5$ AIC 1.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03 $\rho = 0.9$	CV.1se	100.97	21.71	0.46	188.19	103.56	
AIC 859.08 842.76 851.85 513.31 $Oracle: 215.38$ BIC 0.21 0.02 57.73 2.33 $Oracle: 215.38$ CV.1se 1.16 0.22 0.01 100.15 0.94 CV.min 43.6 11.7 0.7 220.4 43.56 $sd(\mu)/\sigma = 1$ AICc 50.78 20.82 92.93 157.62 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 BIC 0.09 0.02 0 0.49 $Oracle: 215.2$ CV.1se 0.08 0.06 0.12 2.54 0.43 $Oracle: 215.2$ AIC 15.13 1.57 0.61 55.82 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $Oracle: 211.72$ CV.1se 0.54 0.02 0.01 84.71 0.61 $Oracle: 211.72$ AICc 46.82 11.92 0 138.77 $Oracle: 211.72$ AICc 885.04 873.33 897.03 543 $Oracle: 211.72$ DV.1se 0.07 0 630.51 0.52 $Oracle: 211.72$ CV.1se 0.02 0 0 29.41 0.44 $Oracle: 211.72$ AICc 17.58 0.3 0 98.87 $Oracle: 211.72$ AICc 17.58 0.3 0 98.87 $Oracle: 211.72$ BIC 0.05 0 16.53 0.3 $Oracle: 20.5$ AIC 872.97 860.48 877.79 531.04 $Oracle: 20.5$ AIC 872.97 860.48 877.99 531.04	CV.min	262.26	97.96	5.38	285.37	264.16	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 0.21 0.02 57.73 2.33 Oracle : 215.38 CV.1se 1.16 0.22 0.01 100.15 0.94 CV.min 43.6 11.7 0.7 220.4 43.56 sd(μ)/σ = 1 AICc 50.78 20.82 92.93 157.62 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 Oracle : 215.2 BIC 0.09 0.02 0 0.49 Oracle : 215.2 CV.1se 0.08 0.06 0.12 2.54 0.43 Oracle : 215.2 CV.nin 8.94 5.47 1.44 47.71 5.17 sd(μ)/σ = 1 AIC 719.38 695.56 676.52 227.69 Oracle : 211.72 CV.1se 0.54 0.02 0.01 84.71 0.61 CV.nin 36.97 1.99 0.41 199.88 34.32 sd(μ)/σ = 0.5 AIC 885.04 873.33 897.03 543 Oracle : 91.35	AICc	164.94	172.26	167.66	211.65		$\rho = 0$
BIC 0.21 0.02 57.73 2.33 CV.Ise 1.16 0.22 0.01 100.15 0.94 CV.min 43.6 11.7 0.7 220.4 43.56 $sd(\mu)/\sigma = 1$ AIC 50.78 20.82 92.93 157.62 $\rho = 0.5$ AIC 856.8 842.84 841.34 536.23 Oracle : 215.2 BIC 0.09 0.02 0 0.49 Oracle : 215.2 CV.Ise 0.08 0.06 0.12 2.54 0.43 CV.min 8.94 5.47 1.44 47.71 5.17 $sd(\mu)/\sigma = 1$ AIC 15.13 1.57 0.61 55.82 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 Oracle : 211.72 CV.Ise 0.54 0.02 0.01 84.71 0.61 column colum	AIC	859.08	842.76	851.85	513.31		O1- 215 29
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.21	0.02	57.73	2.33		Oracie : 215.38
AICc 50.78 20.82 92.93 157.62 $ρ = 0.5$ AIC 856.8 842.84 841.34 536.23 $ρ = 0.5$ BIC 0.09 0.02 0 0.49 $ρ = 0.5$ CV.1se 0.08 0.06 0.12 2.54 0.43 CV.min 8.94 5.47 1.44 47.71 5.17 $p = 0.9$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $p = 0.5$ AICc 46.82 11.92 0 138.77 $p = 0.5$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 0.52 $p = 0.9$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 0.52 $p = 0.5$ AIC 87.29 860.48 877.79 531.04 $p = 0.5$ AIC 87.29 860.48 877.79 531.04 $p = 0.5$ AIC 872.97 860.48 877.79 830.04 $p = 0.5$ AIC 872.97 860.48 877.79 80.03 $p = 0.5$ AIC 872.97 860.48 877.79 80.04 32.27 $p = 0.5$ AIC 872.97 860.48 877.99 872.90 $p = 0.5$ AIC 872.97 860.48 872.90 $p = 0.5$ AIC 872.97 873.45 769.48 99.03 $p = 0.5$ AIC 872.97 873.45 769.48 99.03	CV.1se	1.16	0.22	0.01	100.15	0.94	
AIC 856.8 842.84 841.34 536.23 $Oracle : 215.2$ BIC 0.09 0.02 0 0.49 $Oracle : 215.2$ CV.1se 0.08 0.06 0.12 2.54 0.43 $Oracle : 215.2$ CV.min 8.94 5.47 1.44 47.71 5.17 $Oracle : 215.2$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $Oracle : 211.72$ CV.1se 0.54 0.02 0.01 84.71 0.61 $Oracle : 211.72$ CV.min 36.97 1.99 0.41 199.88 34.32 $Oracle : 211.72$ AIC 885.04 873.33 897.03 543 $Oracle : 211.72$ BIC 0.07 0 630.51 0.52 $Oracle : 211.72$ CV.1se 0.02 0 0 0 29.41 0.44 $Oracle : 211.72$ AIC 872.97 860.48 877.79 531.04 $Oracle : 211.72$ Sd(μ)/ $Oracle : 211.72$ CV.1se 0.02 0 0 98.87 $Oracle : 211.72$ CV.1se 0.05 0 16.53 0.3 $Oracle : 211.72$ Sd(μ)/ $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ CV.1se 0.01 0.01 0.01 0.01 0.7 0.43 $Oracle : 211.72$ Oracle $Oracle : 211.72$	CV.min	43.6	11.7	0.7	220.4	43.56	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 0.09 0.02 0 0.49	AICc	50.78	20.82	92.93	157.62		$\rho = 0.5$
BIC 0.09 0.02 0 0.49	AIC	856.8	842.84	841.34	536.23		0 1 215.2
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.09	0.02	0			<i>Oracle</i> : 215.2
AICc 15.13 1.57 0.61 55.82 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.9$ CV.1se 0.54 0.02 0.01 84.71 0.61 CV.min 36.97 1.99 0.41 199.88 34.32 $\rho = 0.5$ AICc 46.82 11.92 0 138.77 $\rho = 0.5$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 0.52 $\rho = 0.5$ CV.1se 0.02 0 0 0 29.41 0.44 CV.min 7.32 1.13 0.21 130.17 7.21 $\rho = 0.5$ AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 0 16.53 0.3 $\rho = 0.5$ CV.1se 0.01 0.01 0.01 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $\rho = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03 $\rho = 0.9$	CV.1se	0.08	0.06	0.12	2.54	0.43	
AICc 15.13 1.57 0.61 55.82 $\rho = 0.9$ AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 $\rho = 0.9$ Oracle : 211.72 $\rho = 0.9$ Oracle : 27.01	CV.min	8.94	5.47	1.44	47.71	5.17	$\operatorname{sd}(\mu)/\sigma = 1$
AIC 719.38 695.56 676.52 227.69 BIC 1.02 0.78 0.29 1.44 CV.1se 0.54 0.02 0.01 84.71 0.61 CV.min 36.97 1.99 0.41 199.88 34.32 $sd(\mu)/\sigma = 0.5$ AICc 46.82 11.92 0 138.77 $\rho = 0$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 0.52 CV.1se 0.02 0 0 29.41 0.44 CV.min 7.32 1.13 0.21 130.17 7.21 $sd(\mu)/\sigma = 0.5$ AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 0 16.53 0.3 CV.1se 0.01 0.01 0.01 0.07 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $sd(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03 Oracle : 211.72 Oracle : 211.72 $Oracle : 211.72$	AICc			0.61	55.82		
BIC 1.02 0.78 0.29 1.44 CV.1se 0.54 0.02 0.01 84.71 0.61 CV.min 36.97 1.99 0.41 199.88 34.32 $sd(\mu)/\sigma = 0.5$ AICc 46.82 11.92 0 138.77 $\rho = 0$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 0.52 CV.1se 0.02 0 0 29.41 0.44 CV.min 7.32 1.13 0.21 130.17 7.21 $sd(\mu)/\sigma = 0.5$ AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 0 16.53 0.3 CV.1se 0.01 0.01 0.01 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $sd(\mu)/\sigma = 0.5$ AIC 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03	AIC			676.52	227.69		0 1 211 72
$\begin{array}{ c c c c c c c }\hline \text{CV.1se} & 0.54 & 0.02 & 0.01 & 84.71 & 0.61 \\ \hline \text{CV.min} & 36.97 & 1.99 & 0.41 & 199.88 & 34.32 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AICc} & 46.82 & 11.92 & 0 & 138.77 & & & & & \\ \hline \text{AIC} & 885.04 & 873.33 & 897.03 & 543 & & & \\ \hline \text{BIC} & 0.07 & 0 & 630.51 & 0.52 & & & & \\ \hline \text{CV.1se} & 0.02 & 0 & 0 & 29.41 & 0.44 \\ \hline \text{CV.min} & 7.32 & 1.13 & 0.21 & 130.17 & 7.21 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AICc} & 17.58 & 0.3 & 0 & 98.87 & & & & \\ \hline \text{AIC} & 872.97 & 860.48 & 877.79 & 531.04 \\ \hline \text{BIC} & 0.05 & 0 & 16.53 & 0.3 & & & \\ \hline \text{CV.1se} & 0.01 & 0.01 & 0.01 & 0.7 & 0.43 \\ \hline \text{CV.min} & 5.43 & 2.73 & 0.68 & 30.47 & 4.77 & \operatorname{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AICc} & 11.34 & 0.51 & 0.04 & 32.27 & & & \\ \hline \text{AIC} & 778.52 & 754.45 & 769.48 & 99.03 & & & \\ \hline \text{Oracle}: 87.01 \\ \hline \end{array}$	BIC		0.78	0.29			Oracle: 211.72
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se					0.61	
AICc 46.82 11.92 0 138.77 $\rho = 0$ AIC 885.04 873.33 897.03 543 BIC 0.07 0 630.51 0.52 CV.1se 0.02 0 0 29.41 0.44 CV.min 7.32 1.13 0.21 130.17 7.21 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 0 16.53 0.3 CV.1se 0.01 0.01 0.01 0.7 CV.min 5.43 2.73 0.68 30.47 4.77 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03		36.97					$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 885.04 873.33 897.03 543 $Oracle: 91.35$ BIC 0.07 0 630.51 0.52 $Oracle: 91.35$ CV.1se 0.02 0 0 29.41 0.44 CV.min 7.32 1.13 0.21 130.17 7.21 $sd(\mu)/\sigma = 0.5$ AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 $Oracle: 90.94$ BIC 0.05 0 16.53 0.3 $Oracle: 90.94$ CV.1se 0.01 0.01 0.01 0.7 0.43 $Oracle: 90.94$ AIC 11.34 0.51 0.04 32.27 $Oracle: 87.01$ AIC 778.52 754.45 769.48 99.03	AICc			0			. , ,
BIC 0.07 0 630.51 0.52 CV.1se 0.02 0 0 29.41 0.44 CV.min 7.32 1.13 0.21 130.17 7.21 $sd(\mu)/\sigma = 0.5$ AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 Oracle: 90.94 BIC 0.05 0 16.53 0.3 Oracle: 90.94 CV.1se 0.01 0.01 0.7 0.43 Oracle: 90.94 CV.min 5.43 2.73 0.68 30.47 4.77 $sd(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03 Oracle: 87.01	AIC	885.04			543		·
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.07	0	630.51	0.52		<i>Oracle</i> : 91.35
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	0.02	0	0	29.41	0.44	
AICc 17.58 0.3 0 98.87 $\rho = 0.5$ AIC 872.97 860.48 877.79 531.04 BIC 0.05 0 16.53 0.3 Oracle : 90.94 CV.1se 0.01 0.01 0.01 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03		7.32					$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 872.97 860.48 877.79 531.04 Oracle: 90.94 BIC 0.05 0 16.53 0.3 Oracle: 90.94 CV.1se 0.01 0.01 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $sd(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03 Oracle: 87.01	AICc	17.58	0.3	0	98.87		. , ,
BIC 0.05 0 16.53 0.3 Oracle: 90.94 CV.1se 0.01 0.01 0.01 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $sd(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03 Oracle: 87.01	AIC		860.48	877.79			0 1 00 04
CV.1se 0.01 0.01 0.01 0.7 0.43 CV.min 5.43 2.73 0.68 30.47 4.77 $sd(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03	BIC			16.53			<i>Oracle</i> : 90.94
CV.min 5.43 2.73 0.68 30.47 4.77 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03	CV.1se			0.01		0.43	
AICc 11.34 0.51 0.04 32.27 $\rho = 0.9$ AIC 778.52 754.45 769.48 99.03							$sd(\mu)/\sigma = 0.5$
AIC 778.52 754.45 769.48 99.03 Oracle: 87.01							. , ,
Dracle : X / 111							
					0.57		<i>Oracie</i> : 87.01

Table 99: Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 10.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
AICc 98.98 77.6 49.53 50.88 $\rho = 0$ AIC 610.24 607.85 580.06 51.93 BIC 30.26 26.27 20.03 25.44 $\rho = 0$ CV.1se 44.05 32.41 20.14 30.74 18.92 $\rho = 0$ AIC 104.11 81.17 52.37 52.6 $\rho = 0.5$ AIC 610.47 607.84 581.21 53.89 $\rho = 0.5$ AIC 610.47 607.84 581.21 53.89 $\rho = 0.5$ AIC 30.88 26.52 19.98 25.81 $\rho = 0.5$ CV.1se 46.51 33.25 20.37 30.94 18.89 $\rho = 0.5$ AIC 603.01 600.65 573.87 53.42 $\rho = 0.9$ AIC 603.01 600.65 573.87 53.42 $\rho = 0.9$ AIC 31.45 26.79 19.89 26.34 $\rho = 0.9$ AIC 77.65 53.99 19.18 115.31 26.75 $\rho = 0.9$ AIC 740.95 735.1 706.81 151.88 $\rho = 0$ AIC 740.95 735.1 706.81 151.88 $\rho = 0$ CV.1se 25.48 18.62 12.19 40.73 11.94 $\rho = 0.5$ AIC 83.27 62.65 48.1 99 $\rho = 0.5$ AIC 737.07 730.88 702.58 11.45 $\rho = 0.5$ AIC 737.07 730.88 702.58 151.4 BIC 19.8 16.68 11.48 18.41 $\rho = 0.5$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.5$ CV.1se 8.8 6.95 4.91 41.65 5.07 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.5$ CV.1se 8.8 6.95 4.91 41.65 5.07 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.5$ CV.1se 8.8 6.95 7.28 3.27 10.28 $\rho = 0.5$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.5$ CV.1se 8.8 6.95 7.28 3.27 10.28 $\rho = 0.5$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.5$ CV.1se 8.8 6.95 7.28 3.27 10.28 $\rho = 0.5$ CV.1se 8.92 58.6 42.8 41.65 105.83 $\rho = 0.5$ AIC 59.86 42		40.31		20.05	28.86	18.91	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min				53.45	32.56	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 30.26 26.27 20.03 25.44 Oracle: 100 CV.Ise 44.05 32.41 20.14 30.74 18.92 $sd(\mu)/\sigma = 2$ AIC 104.11 81.17 52.37 52.6 $\rho = 0.5$ AIC 610.47 607.84 581.21 53.89 Oracle: 100 BIC 30.88 26.52 19.98 25.81 Oracle: 100 CV.Ise 46.51 33.25 20.37 30.94 18.89 CV.min 114.65 86.73 34.43 54.94 33.32 $sd(\mu)/\sigma = 2$ AIC 106.36 82.32 52.09 52.42 $\rho = 0.9$ AIC 603.01 600.65 573.87 53.42 $Oracle: 100$ CV.Ise 24.12 18 12.28 37.66 11.93 $cd(\mu)/\sigma = 1$ AIC 79.7 60.07 48.95 98.08 $\rho = 0$ AIC 740.95 735.1 706.81 151.88 $Oracle: 100$ CV.Is		98.98		49.53			$\rho = 0$
Signature Si							Oracle : 100
$ \begin{array}{c} \text{CV.min} & 111.63 & 84.08 & 33.12 & 55.42 & 32.39 & \mathrm{sd}(\mu)/\sigma = 2 \\ \text{AICc} & 104.11 & 81.17 & 52.37 & 52.6 & \rho = 0.5 \\ \text{AIC} & 610.47 & 607.84 & 581.21 & 53.89 & Oracle : 100 \\ \text{BIC} & 30.88 & 26.52 & 19.98 & 25.81 & Oracle : 100 \\ \hline \text{CV.lise} & 46.51 & 33.25 & 20.37 & 30.94 & 18.89 & \text{cV.min} \\ \text{CV.min} & 114.65 & 86.73 & 34.43 & 54.94 & 33.32 & \mathrm{sd}(\mu)/\sigma = 2 \\ \text{AICc} & 106.36 & 82.32 & 52.09 & 52.42 & \rho = 0.9 \\ \text{AIC} & 603.01 & 600.65 & 573.87 & 53.42 & Oracle : 100 \\ \hline \text{CV.lise} & 24.12 & 18 & 12.28 & 37.66 & 11.93 & \text{CV.min} \\ \text{CV.min} & 77.65 & 53.99 & 19.18 & 115.31 & 26.75 & \mathrm{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 79.7 & 60.07 & 48.95 & 98.08 & Oracle : 100 \\ \hline \text{CV.lise} & 25.48 & 18.62 & 12.19 & 40.73 & 11.94 & \text{cV.min} \\ \text{CV.min} & 82.88 & 57.91 & 18.81 & 119.38 & 24.97 & \mathrm{sd}(\mu)/\sigma = 1 \\ \text{AICc} & 83.27 & 62.65 & 48.1 & 99 & \rho = 0.5 \\ \hline \text{AIC} & 740.95 & 735.1 & 706.81 & 151.88 & Oracle : 100 \\ \hline \text{CV.lise} & 25.48 & 18.62 & 12.19 & 40.73 & 11.94 & \text{cV.min} \\ \hline \text{CV.min} & 82.88 & 57.91 & 18.81 & 119.38 & 24.97 & \mathrm{sd}(\mu)/\sigma = 1 \\ \hline \text{AICc} & 83.27 & 62.65 & 48.1 & 99 & \rho = 0.5 \\ \hline \text{AIC} & 742.55 & 736.42 & 708.63 & 158.35 & Oracle : 100 \\ \hline \text{CV.lise} & 27.06 & 19.2 & 12.25 & 40.53 & 11.86 & \text{cV.min} \\ \hline \text{CV.min} & 85.96 & 60.33 & 19.87 & 114.79 & 25.6 & \mathrm{sd}(\mu)/\sigma = 1 \\ \hline \text{AICc} & 85.49 & 64.06 & 48.59 & 100.28 & \rho = 0.9 \\ \hline \text{AIC} & 737.07 & 730.88 & 702.58 & 151.4 & Oracle : 100 \\ \hline \text{CV.lise} & 8.8 & 6.95 & 4.91 & 41.65 & 5.07 & \text{cV.min} \\ \hline \text{AIC} & 829.25 & 820.55 & 811.29 & 314.29 & \text{oracle} : 100 \\ \hline \text{CV.lise} & 8.95 & 7.28 & 3.27 & 10.28 & Oracle : 100 \\ \hline \text{CV.lise} & 8.74 & 6.96 & 4.82 & 45.44 & 4.89 & \text{cV.min} \\ \hline \text{CV.lin} & 50.7 & 31.3 & 9.68 & 143.2 & 20.67 & \mathrm{sd}(\mu)/\sigma = 0.5 \\ \hline \text{AIC} & 831.69 & 823.13 & 813.1 & 319.72 & Oracle : 100 \\ \hline \text{CV.lise} & 9.09 & 6.99 & 4.67 & 42.87 & 4.94 & \text{cV.min} \\ \hline \text{CV.lise} & 9.09 & 6.99 & 4.67 & 42.87 & 4.94 & \text{cV.min} \\ \hline \text{CV.lise} & 9.09 & 6.99 & 4.67 & 42.87 & 4.94 & \text{cV.min} \\ \hline \text{CV.lise} & 9.09 & 6.99 & 4.67 & 42.87 &$	BIC		26.27				07 acic . 100
AICc 104.11 81.17 52.37 52.6 $\rho = 0.5$ AIC 610.47 607.84 581.21 53.89 BIC 30.88 26.52 19.98 25.81 $\rho = 0.5$ CV.1se 46.51 33.25 20.37 30.94 18.89 CV.min 114.65 86.73 34.43 54.94 33.32 $\rho = 0.9$ AIC 106.36 82.32 52.09 52.42 $\rho = 0.9$ AIC 603.01 600.65 573.87 53.42 BIC 31.45 26.79 19.89 26.34 $\rho = 0.9$ CV.lise 24.12 18 12.28 37.66 11.93 $\rho = 0.9$ AIC 79.7 60.07 48.95 98.08 $\rho = 0.9$ AIC 740.95 735.1 706.81 151.88 BIC 19.82 16.68 11.65 18.05 $\rho = 0.9$ AIC 82.88 57.91 18.81 119.38 24.97 $\rho = 0.9$ AIC 742.55 736.42 708.63 158.35 $\rho = 0.5$ AIC 747.56 60.33 19.87 114.79 25.6 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.92 82.86 9.81 139.88 22.67 $\rho = 0.9$ AIC 82.93 82.31 83.11 195.62 $\rho = 0.9$ AIC 82.93 82.31 83.11 195.62 $\rho = 0.9$ AIC 82.94 60.96 4.82 45.44 4.89 $\rho = 0.9$ AIC 82.95 86 42.8 41.65 105.83 $\rho = 0.9$ AIC 82.95 86 42.8 41.65 105.83 $\rho = 0.9$ AIC 82.95 86 42.8 41.65 105.83 $\rho = 0.9$ AIC 82.95 86 42.8 41.65 105.83 $\rho = 0.9$ AIC 82.97 82.97 9.71 136.41 20.61 $\rho = 0.9$ AIC 82.97 82.97 9.71 136.41 20.61 $\rho = 0.9$ AIC 82.76 819.49 808.99 303.88 $\rho = 0.9$ AIC 82.76 819.49 808.99 303.88 $\rho = 0.9$ A							
AIC 610.47 607.84 581.21 53.89 $Oracle:100$ BIC 30.88 26.52 19.98 25.81 $Oracle:100$ Or	CV.min					32.39	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 30.88 26.52 19.98 25.81 Oracle: 100 CV. Ise 46.51 33.25 20.37 30.94 18.89 sd(μ)/σ = 2 CV.min 114.65 86.73 34.43 54.94 33.32 sd(μ)/σ = 2 AIC 106.36 82.32 52.09 52.42 ρ = 0.9 AIC 603.01 600.65 573.87 53.42 Oracle : 100 EV.1se 24.12 18 12.28 37.66 11.93 CV.nise 24.12 18 12.28 37.66 11.93 CV.min 77.65 53.99 19.18 115.31 26.75 sd(μ)/σ = 1 AIC 79.7 60.07 48.95 98.08 ρ = 0.7 AIC 740.95 735.1 706.81 151.88 BIC 19.82 16.68 11.65 18.05 CV.lise 25.48 18.62 12.19 40.73 11.94 CV.min 82.88 57.91 18.81	AICc	104.11	81.17	52.37	52.6		$\rho = 0.5$
BIC 30.88 26.52 19.98 25.81 CV.1se 46.51 33.25 20.37 30.94 18.89 CV.min 114.65 86.73 34.43 54.94 33.32 sd(μ)/σ = 2 AICc 106.36 82.32 52.09 52.42 ρ = 0.9 AIC 603.01 600.65 573.87 53.42 Oracle : 100 CV.Ise 24.12 18 12.28 37.66 11.93 CV.min 77.65 53.99 19.18 115.31 26.75 sd(μ)/σ = 1 AIC 79.7 60.07 48.95 98.08 ρ = 0 AIC 740.95 735.1 706.81 151.88 Oracle : 100 CV.lse 25.48 18.62 12.19 40.73 11.94 cv.min 82.88 57.91 18.81 119.38 24.97 sd(μ)/σ = 1 ρ = 0.5 AIC 742.55 736.42 708.63 158.35 Oracle : 100 Oracle : 100 Oracle : 100 Oracle : 100<	AIC			581.21	53.89		Oracle : 100
$\begin{array}{c} \text{CV.min} & 114.65 \\ \text{AICc} & 106.36 \\ \text{A2.32} \\ \text{S2.09} \\ \text{S2.09} \\ \text{S2.42} \\ \text{S2.09} \\ \text{S2.42} \\ \text{Oracle} : 100 \\ \text{Oracle} : 100 \\ \text{Oracle} : 100 \\ \text{CV.1se} & 24.12 \\ \text{AIC} \\ \text{CV.min} & 77.65 \\ \text{S3.99} \\ \text{IS} & 19.89 \\ \text{AIC} \\ \text{CV.min} & 77.65 \\ \text{S3.99} \\ \text{IS} & 19.89 \\ \text{AIC} \\ \text{CV.min} & 77.65 \\ \text{S3.99} \\ \text{IS} & 19.18 \\ \text{II} & 15.31 \\ \text{IS} & 12.28 \\ \text{S37.66} \\ \text{II.93} \\ \text{CV.min} \\ \text{AICc} & 79.7 \\ \text{G0.07} & 48.95 \\ \text{98.08} \\ \text{Pe} = 0 \\ \text{AIC} \\ \text{T40.95} & 735.1 \\ \text{T06.81} \\ \text{II5.88} \\ \text{BIC} \\ \text{II9.82} & 16.68 \\ \text{II.65} \\ \text{II.65} \\ \text{II.65} \\ \text{II.805} \\ \text{CV.Inin} \\ \text{S2.88} \\ \text{S7.91} \\ \text{II.881} \\ \text{II19.38} \\ \text{24.97} \\ \text{Sd}(\mu)/\sigma = 1 \\ \text{AICc} \\ \text{S3.27} \\ \text{G2.65} \\ \text{48.1} \\ \text{99} \\ \text{Pe} = 0.5 \\ \text{AIC} \\ \text{T42.55} \\ \text{736.42} \\ \text{708.63} \\ \text{I1.68} \\ \text{I1.48} \\ \text{II.479} \\ \text{CV.Inin} \\ \text{S5.96} \\ \text{G0.33} \\ \text{II.9.87} \\ \text{II.4.79} \\ \text{II.4.79} \\ \text{25.6} \\ \text{Sd}(\mu)/\sigma = 1 \\ \text{Pe} = 0.5 \\ \text{AICc} \\ \text{S5.49} \\ \text{G4.06} \\ \text{48.59} \\ \text{II0.028} \\ \text{Oracle} : 100 \\ \text{CV.Inin} \\ \text{S5.96} \\ \text{G0.33} \\ \text{II.48} \\ \text{II.48} \\ \text{II.49} \\ \text{II.479} \\ \text{25.6} \\ \text{Sd}(\mu)/\sigma = 1 \\ \text{Pe} = 0.9 \\ \text{AIC} \\ \text{T37.07} \\ \text{730.88} \\ \text{702.58} \\ \text{I51.4} \\ \text{BIC} \\ \text{II.991} \\ \text{II.668} \\ \text{II.48} \\ \text{II.48} \\ \text{II.48} \\ \text{II.49} \\ \text{CV.Inin} \\ \text{47.95} \\ \text{28.46} \\ \text{9.81} \\ \text{139.88} \\ \text{22.67} \\ \text{Sd}(\mu)/\sigma = 0.5 \\ \text{AICc} \\ \text{8.778} \\ \text{39.55} \\ \text{38.41} \\ \text{105.62} \\ \text{Pe} = 0 \\ \text{Oracle} : 100 \\ \text{CV.Ise} \\ \text{8.74} \\ \text{6.96} \\ \text{4.82} \\ \text{45.44} \\ \text{4.89} \\ \text{CV.min} \\ \text{50.7} \\ \text{31.3} \\ \text{9.68} \\ \text{143.2} \\ \text{20.67} \\ \text{Sd}(\mu)/\sigma = 0.5 \\ \text{Oracle} : 100 \\ \text{CV.Ise} \\ \text{9.09} \\ \text{6.99} \\ \text{4.67} \\ \text{42.87} \\ \text{4.94} \\ \text{CV.min} \\ \text{52.97} \\ \text{32.97} \\ \text{9.71} \\ \text{136.41} \\ \text{20.61} \\ \text{Sd}(\mu)/\sigma = 0.5 \\ \text{Oracle} : 100 \\ \text{Oracle}$	BIC						07acic . 100
AICc 106.36 82.32 52.09 52.42 $\rho = 0.9$ AIC 603.01 600.65 573.87 53.42 $\rho = 0.9$ BIC 31.45 26.79 19.89 26.34 $\rho = 0.9$ CV.1se 24.12 18 12.28 37.66 11.93 $\rho = 0.9$ AIC 79.7 60.07 48.95 98.08 $\rho = 0.9$ AIC 740.95 735.1 706.81 151.88 $\rho = 0.9$ AIC 19.82 16.68 11.65 18.05 $\rho = 0.9$ AIC 82.54 18.62 12.19 40.73 11.94 $\rho = 0.9$ AIC 83.27 62.65 48.1 99 $\rho = 0.9$ AIC 742.55 736.42 708.63 158.35 $\rho = 0.5$ AIC 742.55 736.42 708.63 158.35 $\rho = 0.5$ AIC 742.55 736.42 708.63 158.35 $\rho = 0.5$ AIC 85.49 64.06 48.59 100.28 $\rho = 0.9$ AIC 73.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ AIC 73.07 730.88 702.58 151.4 $\rho = 0.9$ AIC 73.07 730.88 702.58 151.4 $\rho = 0.9$ AIC 82.25 82.55 811.29 314.29 $\rho = 0.5$ AIC 82.25 82.55 811.29 314.29 $\rho = 0.5$ AIC 82.25 82.55 811.29 314.29 $\rho = 0.5$ AIC 83.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 83.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 83.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 82.67 819.49 808.99 303.88 $\rho = 0.9$ AIC 82.67 819.49 808.99 303.88 $\rho = 0.9$ AIC 82.67 819.49 808.99 303.88	CV.1se	46.51	33.25	20.37	30.94	18.89	
AIC 603.01 600.65 573.87 53.42 $Oracle:100$ CV.1se 24.12 18 12.28 37.66 11.93 $Oracle:100$ CV.min 77.65 53.99 19.18 115.31 26.75 $oracle:100$ AICc 79.7 60.07 48.95 98.08 $oracle:100$ AIC 740.95 735.1 706.81 151.88 $oracle:100$ CV.min 82.88 57.91 18.81 119.38 24.97 $oracle:100$ CV.min 82.88 57.91 18.81 119.38 24.97 $oracle:100$ AIC 742.55 736.42 708.63 158.35 $oracle:100$ CV.1se 25.48 18.62 12.19 40.73 11.94 $oracle:100$ CV.min 82.88 57.91 18.81 119.38 24.97 $oracle:100$ CV.min 82.88 57.91 18.81 119.38 24.97 $oracle:100$ CV.1se 27.06 19.2 12.25 40.53 11.86 $oracle:100$ CV.1se 27.06 19.2 12.25 40.53 11.86 $oracle:100$ CV.min 85.96 60.33 19.87 114.79 25.6 $oracle:100$ AIC 737.07 730.88 702.58 151.4 $oracle:100$ CV.1se 8.84 6.95 4.91 41.65 5.07 $oracle:100$ CV.1se 8.8 6.95 4.91 41.65 5.07 $oracle:100$ CV.1se 8.8 6.95 4.91 41.65 5.07 $oracle:100$ CV.1se 8.95 7.28 3.27 10.28 $oracle:100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle:100$ CV.1se 8.90 6.99 4.67 42.87 4.94 $oracle:100$ CV.1se 9.09 6.99 4.67 42.87 4.94 $oracle:100$	CV.min	114.65	86.73	34.43	54.94	33.32	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 31.45 26.79 19.89 26.34 $Oracle : 100$ CV.1se 24.12 18 12.28 37.66 11.93 $Oracle : 100$ CV.min 77.65 53.99 19.18 115.31 26.75 $oracle : 100$ AIC 79.7 60.07 48.95 98.08 $oracle : 100$ AIC 740.95 735.1 706.81 151.88 BIC 19.82 16.68 11.65 18.05 $Oracle : 100$ CV.1se 25.48 18.62 12.19 40.73 11.94 $oracle : 100$ CV.min 82.88 57.91 18.81 119.38 24.97 $oracle : 100$ AIC 83.27 62.65 48.1 99 $oracle : 100$ AIC 742.55 736.42 708.63 158.35 BIC 19.8 16.57 11.68 18.14 $oracle : 100$ CV.1se 27.06 19.2 12.25 40.53 11.86 $oracle : 100$ CV.1se 27.06 19.2 12.25 40.53 11.86 $oracle : 100$ AIC 85.49 64.06 48.59 100.28 $oracle : 100$ AIC 737.07 730.88 702.58 151.4 $oracle : 100$ BIC 19.91 16.68 11.48 18.43 $oracle : 100$ CV.1se 8.8 6.95 4.91 41.65 5.07 $oracle : 100$ CV.1se 8.8 6.95 4.91 41.65 5.07 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 8.74 6.96 4.82 45.44 4.89 $oracle : 100$ CV.1se 9.09 6.99 4.67 4.287 4.94 $oracle : 100$ CV.1se 9.09 6.99 4.67 4.287 4.94 $oracle : 100$ CV.1se 9.09 6.99 4.67 4.287 4.94 $oracle : 100$ CV.1se 9.09 6.99 4.67 4.287 4.94 $oracle : 100$ AIC 60.81 42.54 42.61 105.16 $oracle : 100$ AIC 60.81 42.54 42.61 10	AICc	106.36	82.32	52.09	52.42		$\rho = 0.9$
BIC 31.45 26.79 19.89 26.34 CV.1se 24.12 18 12.28 37.66 11.93 CV.min 77.65 53.99 19.18 115.31 26.75 $sd(\mu)/\sigma = 1$ AIC 740.95 735.1 706.81 151.88 Oracle : 100 CV.1se 25.48 18.62 12.19 40.73 11.94 CV.min 82.88 57.91 18.81 119.38 24.97 $sd(\mu)/\sigma = 1$ AIC 83.27 62.65 48.1 99 $\rho = 0.5$ AIC 742.55 736.42 708.63 158.35 Oracle : 100 EV.1se 27.06 19.2 12.25 40.53 11.86 $cv.$ min 85.96 60.33 19.87 114.79 25.6 $sd(\mu)/\sigma = 1$ AIC 737.07 730.88 702.58 151.4 Oracle : 100 CV.nin 47.95 28.46 9.81 139.88 22.67 $sd(\mu)/\sigma = 0.5$ CV.lse 8	AIC	603.01	600.65	573.87	53.42		Orgalo : 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	31.45	26.79	19.89	26.34		Oracie . 100
AICc 79.7 60.07 48.95 98.08 $\rho = 0$ AIC 740.95 735.1 706.81 151.88 BIC 19.82 16.68 11.65 18.05 CV.1se 25.48 18.62 12.19 40.73 11.94 CV.min 82.88 57.91 18.81 119.38 24.97 $\rho = 0.5$ AIC 83.27 62.65 48.1 99 $\rho = 0.5$ AIC 742.55 736.42 708.63 158.35 $\rho = 0.5$ BIC 19.8 16.57 11.68 18.14 CV.nin 85.96 60.33 19.87 114.79 25.6 $\rho = 0.5$ AIC 85.49 64.06 48.59 100.28 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $\rho = 0.5$ AIC 829.25 820.55 811.29 314.29 BIC 8.95 7.28 3.27 10.28 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 BIC 8.24 6.9 3.23 9.92 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.76 819.49 808.99 303.88	CV.1se	24.12	18	12.28	37.66	11.93	
AIC 740.95 735.1 706.81 151.88 $Oracle: 100$ $Oracle: 10$	CV.min	77.65	53.99	19.18	115.31	26.75	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 19.82 16.68 11.65 18.05	AICc	79.7	60.07	48.95	98.08		$\rho = 0$
BIC 19.82 16.68 11.65 18.05 CV.1se 25.48 18.62 12.19 40.73 11.94 CV.min 82.88 57.91 18.81 119.38 24.97 $sd(\mu)/\sigma = 1$ AIC 83.27 62.65 48.1 99 $\rho = 0.5$ AIC 742.55 736.42 708.63 158.35 Oracle : 100 BIC 19.8 16.57 11.68 18.14 Oracle : 100 CV.1se 27.06 19.2 12.25 40.53 11.86 CV.min 85.96 60.33 19.87 114.79 25.6 $sd(\mu)/\sigma = 1$ AIC 85.49 64.06 48.59 100.28 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 Oracle : 100 CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $sd(\mu)/\sigma = 0.5$ AIC 829.25 <td< td=""><td>AIC</td><td>740.95</td><td>735.1</td><td>706.81</td><td>151.88</td><td></td><td>01100</td></td<>	AIC	740.95	735.1	706.81	151.88		01100
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	19.82	16.68	11.65	18.05		Oracie: 100
AICc 83.27 62.65 48.1 99 $\rho = 0.5$ AIC 742.55 736.42 708.63 158.35 $\rho = 0.5$ BIC 19.8 16.57 11.68 18.14 $\rho = 0.5$ CV.1se 27.06 19.2 12.25 40.53 11.86 $\rho = 0.5$ CV.min 85.96 60.33 19.87 114.79 25.6 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 $\rho = 0.9$ AIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ CV.1se 8.8 6.95 4.91 41.65 5.07 $\rho = 0.5$ AICc 829.25 820.55 811.29 314.29 BIC 8.95 7.28 3.27 10.28 $\rho = 0.5$ AIC 829.25 820.55 811.29 314.29 $\rho = 0.5$ AIC 829.25 820.55 81.29 314.29 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 829.7 32.97 9.71 136.41 20.61 $\rho = 0.5$ AIC 82.97 32.97 9.71 136.41 20.61 $\rho = 0.5$ AIC 82.97 32.97 9.71 136.41 20.61 $\rho = 0.5$ AIC 82.97 32.97 9.71 136.41 20.61 $\rho = 0.5$ AIC 82.97 81.49 808.99 303.88	CV.1se	25.48	18.62	12.19	40.73	11.94	
AIC 742.55 736.42 708.63 158.35 BIC 19.8 16.57 11.68 18.14 $CV.1se$ 27.06 19.2 12.25 40.53 11.86 $CV.min$ 85.96 60.33 19.87 114.79 25.6 $cV.min$ 85.96 64.06 48.59 100.28 $cV.min$ 85.49 64.06 48.59 100.28 $cV.min$ 85.49 16.68 11.48 18.43 $cV.1se$ 8.8 6.95 4.91 41.65 5.07 $cV.1se$ 8.8 6.95 4.91 41.65 5.07 $cV.min$ 47.95 28.46 9.81 139.88 22.67 $cV.min$ 47.95 28.46 9.81 139.88 22.67 $cV.1se$ 829.25 820.55 811.29 314.29 $cV.1se$ 8.95 7.28 3.27 10.28 $cV.1se$ 8.74 6.96 4.82 45.44 4.89 $cV.1se$ 8.74 6.96 4.87 41.65 105.83 $cV.1se$ 8.74 6.99 3.23 9.92 $cV.1se$ 8.74 6.99 3.297 9.71 136.41 20.61 $cV.1se$ 8.74 6.99 6.99 4.67 42.87 4.94 $cV.1se$ 9.09 6.99 4.67 42.87 4.94 $cV.1se$	CV.min	82.88	57.91	18.81	119.38	24.97	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 19.8 16.57 11.68 18.14 Oracle: 100 CV.1se 27.06 19.2 12.25 40.53 11.86 CV.min 85.96 60.33 19.87 114.79 25.6 sd(μ)/σ = 1 AICc 85.49 64.06 48.59 100.28 ρ = 0.9 AIC 737.07 730.88 702.58 151.4 Oracle: 100 BIC 19.91 16.68 11.48 18.43 Oracle: 100 CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 sd(μ)/σ = 0.5 AIC 829.25 820.55 811.29 314.29 Oracle: 100 BIC 8.95 7.28 3.27 10.28 Oracle: 100 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 sd(μ)/σ = 0.5 AIC 831.69<	AICc	83.27	62.65	48.1	99		$\rho = 0.5$
BIC 19.8 16.57 11.68 18.14 CV.1se 27.06 19.2 12.25 40.53 11.86 CV.min 85.96 60.33 19.87 114.79 25.6 $sd(\mu)/\sigma = 1$ AIC 85.49 64.06 48.59 100.28 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 Oracle: 100 BIC 19.91 16.68 11.48 18.43 Oracle: 100 CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $sd(\mu)/\sigma = 0.5$ AIC 829.25 820.55 811.29 314.29 Oracle: 100 BIC 8.95 7.28 3.27 10.28 Oracle: 100 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $sd(\mu)/\sigma = 0.5$ AIC 831.69 823.1	AIC	742.55	736.42	708.63	158.35		Oma ala . 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	19.8	16.57	11.68	18.14		Oracie: 100
AICc 85.49 64.06 48.59 100.28 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $\rho = 0.5$ AICc 57.78 39.55 38.41 105.62 $\rho = 0.5$ AIC 829.25 820.55 811.29 314.29 BIC 8.95 7.28 3.27 10.28 $\rho = 0.5$ CV.min 50.7 31.3 9.68 143.2 20.67 $\rho = 0.5$ AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 8.24 6.9 3.23 9.92 $\rho = 0.5$ CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $\rho = 0.5$ AIC 827.67 819.49 808.99 303.88	CV.1se	27.06	19.2	12.25	40.53	11.86	
AICc 85.49 64.06 48.59 100.28 $\rho = 0.9$ AIC 737.07 730.88 702.58 151.4 $\rho = 0.9$ BIC 19.91 16.68 11.48 18.43 $\rho = 0.9$ CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $\rho = 0.5$ AICc 57.78 39.55 38.41 105.62 $\rho = 0.5$ AIC 829.25 820.55 811.29 314.29 BIC 8.95 7.28 3.27 10.28 $\rho = 0.5$ CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $\rho = 0.5$ AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 $\rho = 0.5$ AIC 8.24 6.9 3.23 9.92 $\rho = 0.5$ CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $\rho = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88	CV.min	85.96	60.33	19.87	114.79	25.6	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 19.91 16.68 11.48 18.43 Oracle: 100 CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $sd(\mu)/\sigma = 0.5$ AICc 57.78 39.55 38.41 105.62 $\rho = 0$ AIC 829.25 820.55 811.29 314.29 Oracle: 100 BIC 8.95 7.28 3.27 10.28 Oracle: 100 CV.1se 8.74 6.96 4.82 45.44 4.89 $Oracle: 100$ AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ $Oracle: 100$ BIC 8.24 6.9 3.23 9.92 Oracle: 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$	AICc	85.49	64.06	48.59	100.28		$\rho = 0.9$
BIC 19.91 16.68 11.48 18.43 CV.1se 8.8 6.95 4.91 41.65 5.07 CV.min 47.95 28.46 9.81 139.88 22.67 $sd(\mu)/\sigma = 0.5$ AICc 57.78 39.55 38.41 105.62 $\rho = 0$ AIC 829.25 820.55 811.29 314.29 Oracle: 100 BIC 8.95 7.28 3.27 10.28 Oracle: 100 CV.1se 8.74 6.96 4.82 45.44 4.89 $\sigma = 0.5$ CV.min 50.7 31.3 9.68 143.2 20.67 $sd(\mu)/\sigma = 0.5$ AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 Oracle: 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AIC 60.81	AIC	737.07	730.88	702.58	151.4		Oma ala . 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	19.91	16.68	11.48	18.43		Oracie: 100
AICc 57.78 39.55 38.41 105.62 $\rho = 0$ AIC 829.25 820.55 811.29 314.29 BIC 8.95 7.28 3.27 10.28 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $sd(\mu)/\sigma = 0.5$ AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 BIC 8.24 6.9 3.23 9.92 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88	CV.1se	8.8	6.95	4.91	41.65	5.07	
AIC 829.25 820.55 811.29 314.29 BIC 8.95 7.28 3.27 10.28 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $sd(μ)/σ = 0.5$ AICc 59.86 42.8 41.65 105.83 $ρ = 0.5$ AIC 831.69 823.13 813.1 319.72 Oracle: 100 BIC 8.24 6.9 3.23 9.92 Oracle: 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(μ)/σ = 0.5$ AICc 60.81 42.54 42.61 105.16 $ρ = 0.9$ AIC 827.67 819.49 808.99 303.88 Oracle: 100	CV.min	47.95	28.46	9.81	139.88	22.67	$\operatorname{sd}(\mu)/\sigma = 0.5$
BIC 8.95 7.28 3.27 10.28 Oracle: 100 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $sd(\mu)/\sigma = 0.5$ AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 Oracle: 100 BIC 8.24 6.9 3.23 9.92 Oracle: 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88 Oracle: 100	AICc	57.78	39.55	38.41	105.62		$\rho = 0$
BIC 8.95 7.28 3.27 10.28 CV.1se 8.74 6.96 4.82 45.44 4.89 CV.min 50.7 31.3 9.68 143.2 20.67 $sd(\mu)/\sigma = 0.5$ AIC 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 Oracle: 100 BIC 8.24 6.9 3.23 9.92 Oracle: 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AIC 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88 Oracle: 100	AIC	829.25	820.55	811.29	314.29		Ongolo : 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		8.95	7.28	3.27	10.28		Oracie: 100
AICc 59.86 42.8 41.65 105.83 $\rho = 0.5$ AIC 831.69 823.13 813.1 319.72 BIC 8.24 6.9 3.23 9.92 Oracle : 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88	CV.1se	8.74	6.96	4.82	45.44	4.89	
AIC 831.69 823.13 813.1 319.72 BIC 8.24 6.9 3.23 9.92 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88 Oracle: 100	CV.min	50.7	31.3	9.68	143.2	20.67	$\operatorname{sd}(\mu)/\sigma = 0.5$
BIC 8.24 6.9 3.23 9.92 Oracle: 100 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88 Oracle: 100	AICc	59.86	42.8	41.65	105.83		$\rho = 0.5$
BIC 8.24 6.9 3.23 9.92 CV.1se 9.09 6.99 4.67 42.87 4.94 CV.min 52.97 32.97 9.71 136.41 20.61 $sd(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88 Oracle: 100	AIC	831.69	823.13	813.1	319.72		Oma ala . 100
CV.min 52.97 32.97 9.71 136.41 20.61 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88	BIC	8.24	6.9	3.23	9.92		Oracie: 100
AICc 60.81 42.54 42.61 105.16 $\rho = 0.9$ AIC 827.67 819.49 808.99 303.88	CV.1se	9.09	6.99	4.67	42.87	4.94	
AIC 827.67 819.49 808.99 303.88	CV.min	52.97	32.97	9.71	136.41	20.61	$\operatorname{sd}(\mu)/\sigma = 0.5$
$\perp Imagle : 100$	AICc	60.81	42.54	42.61	105.16		$\rho = 0.9$
BIC 7.99 6.61 3.12 9.98	AIC	827.67	819.49	808.99	303.88		Oma al a . 100
	BIC	7.99	6.61	3.12	9.98		Oracie: 100

Table 100: Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	175.43	131.08	74.19	139.5	83.2	
CV.min	273.32	210.69	97.36	202.52	140	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	212.68	178.18	151.76	181.73		$\rho = 0$
AIC	742.41	733.99	705	242.57		Oracle: 100
BIC	96.16	82.53	61.51	87.36		Oracie : 100
CV.1se	188.41	140.01	74.22	147.32	81.29	
CV.min	289.76	221.83	99.21	213.1	134.08	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	219.83	186.01	157.36	189.56		$\rho = 0.5$
AIC	747.09	739.6	711.53	257.5		Oracle: 100
BIC	96.13	82.15	61.47	87.16		Oracie: 100
CV.1se	194.84	144.12	76.4	148.48	84.21	
CV.min	294.36	226.66	103.29	212.98	137.41	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	224.82	188.63	156.12	190.14		$\rho = 0.9$
AIC	744.2	736.1	707.58	256.68		, , , , , , , , , , , , , , , , , , , ,
BIC	98.35	83.67	62.07	89.85		Oracle: 100
CV.1se	92.82	63.09	33.42	116.47	61.88	
CV.min	189.27	129.13	52.46	199.8	146.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	156.92	133.8	177.89	165.06		$\rho = 0$
AIC	822.82	812.25	802.46	349.39		,
BIC	27.09	29.39	12.51	42.5		Oracle: 100
CV.1se	97.71	66.33	34.01	123.65	56.4	
CV.min	200.44	136.59	53.86	206.79	135.58	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	160.48	137.61	178.76	171.72		$\rho = 0.5$
AIC	826.98	816.89	806.41	366.05		,
BIC	20.09	26.68	12.12	40.6		Oracle: 100
CV.1se	101.85	69.13	34.08	124.03	58.66	
CV.min	203.2	142.1	54.92	203.48	139.78	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	161.88	139.63	170.51	170.88	10,110	$\rho = 0.9$
AIC	824.07	813.66	803.39	359.09		,
BIC	18.13	25.73	11.32	40.25		Oracle: 100
CV.1se	5.14	1.94	0.32	75.75	3.89	
CV.min	68.01	23.77	3.63	181.1	65.78	$sd(\mu)/\sigma = 0.5$
AICc	73.78	78.02	58.36	134.92	00.70	$\rho = 0$
AIC	873.17	862.19	872.83	460.57		,
BIC	0.42	0.54	0	2.88		Oracle: 100
CV.1se	3.73	1.4	0.22	79.67	2.83	
CV.rsc CV.min	62.83	22.25	2.8	184.49	60.13	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	71.13	76.14	77.37	136.84	00.12	$\rho = 0.5$
AIC	874.64	863.95	873.95	476.73		,
BIC	0.32	0.31	0	2.06		Oracle: 100
CV.1se	3.54	1.18	0.2	75.93	2.03	
CV.1sc CV.min	64.88	23.58	3.04	178.4	60.99	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	72.02	78.07	69.22	134.39	00.77	$\rho = 0.9$
AIC	872.43	861.77	871.47	470.23		
BIC	0.32	0.36	0	2		Oracle: 100
ыс	0.32	0.30	U			

Table 101: Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	215.4	157.96	101.28	173.47	101.32	
CV.min	309.72	229.02	117.87	231.36	130.33	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	237.05	193.49	141.41	206.89		$\rho = 0$
AIC	768.26	758.21	735.21	298.73		Oracle: 100
BIC	134.84	115.96	90.19	124.51		07 acte . 100
CV.1se	231.16	169.53	103.44	185.96	103.13	
CV.min	328.69	242.85	120.28	246.37	127.02	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	249.65	202.7	145.94	218.38		$\rho = 0.5$
AIC	772.58	763.08	739.67	313.69		Oracle: 100
BIC	139.79	120.25	92.05	128.5		Oracle: 100
CV.1se	237.69	173.96	105.44	187.29	107.38	
CV.min	332.46	247.39	124.42	246.92	131.25	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	251.99	205.79	146.88	219.8		$\rho = 0.9$
AIC	769.94	760.51	737.48	314.21		Oma ala . 100
BIC	141.89	122.11	92.61	130.1		Oracle: 100
CV.1se	119.45	79.11	35.38	148.1	108.55	
CV.min	228.04	153.54	64.93	229.09	220.12	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	181.78	160.48	201.95	189		$\rho = 0$
AIC	839.55	827.34	826	408.19		·
BIC	1.65	10.06	1.15	31.29		Oracle: 100
CV.1se	123.87	82.92	34.86	155.56	107.96	
CV.min	239.32	163.23	67.23	237.8	225.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	186.12	166.46	203.71	194.05		$\rho = 0.5$
AIC	842.41	831.19	827.35	420.37		,
BIC	1.13	5.19	0.59	22.8		Oracle: 100
CV.1se	129.01	85.92	34.2	155.18	109.89	
CV.min	243.13	167.63	66.68	233.79	226.19	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	187.36	169.38	204.68	196.69		$\rho = 0.9$
AIC	840	828.47	824.8	420.29		
BIC	0.91	4.39	0.79	19.91		Oracle: 100
CV.1se	2.57	0.43	0.05	80.47	2.17	
CV.min	59.44	10.68	1.48	189.97	58.18	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	66.39	89.24	43.93	139.2		$\rho = 0$
AIC	879.35	868.09	884.4	496.45		·
BIC	0.15	0.08	0	1.19		Oracle: 100
CV.1se	1.88	0.18	0.02	82.72	1.39	
CV.min	50.8	9.75	1.01	191.88	50.04	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	60.04	85.66	54.66	140.12		$\rho = 0.5$
AIC	880.25	869.19	884.55	509.2		
BIC	0.12	0.09	0	0.96		Oracle: 100
CV.1se	1.44	0.17	0.02	79.43	0.86	
CV.min	51.62	9.15	1.13	188.07	49.41	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	62.19	85.73	48.2	137.21		$\rho = 0.9$
AIC	878	866.48	882.09	502.58		
BIC	0.12	0.08	0	0.91		Oracle: 100
	U.12	0.00	<u></u>	V.71		

Table 102: Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	223.47	154.74	105.41	181.12	102.87	
CV.min	315.85	217.6	114.37	235.72	115.77	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	240.77	186.24	117.42	211.66		$\rho = 0$
AIC	778.83	767.52	748.55	316.97		Oracle: 100
BIC	151.59	123.47	98.71	142.11		Oracle: 100
CV.1se	240.16	164.98	106.23	194.44	103.18	
CV.min	335.75	230.41	115.06	250.41	115.2	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	253.11	194.89	117.28	224.09		$\rho = 0.5$
AIC	782.5	771.91	752.25	331.54		Oracle: 100
BIC	158.26	128.53	99.79	149.37		Oracle: 100
CV.1se	246.41	169.61	108.95	197.57	107.39	
CV.min	338.95	235.48	119.59	252.67	117.65	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	256.47	198	118.41	227.23		$\rho = 0.9$
AIC	779.85	768.82	749.55	334.42		01100
BIC	161.59	131.61	100.9	152.24		Oracle: 100
CV.1se	129.48	81.48	29.41	161.11	126.39	
CV.min	242.28	157.77	63.88	241.7	243.14	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	189.39	169.39	217.21	199.46		$\rho = 0$
AIC	845.87	832.2	835.41	431.73		,
BIC	0.45	3.82	0.76	16.61		Oracle: 100
CV.1se	134.01	85.2	25.91	169.33	128.57	
CV.min	253.93	168.79	62.37	250.16	251.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	196.41	178.87	213.42	206.23		$\rho = 0.5$
AIC	848.39	835.64	836.52	443.43		,
BIC	0.37	1.65	0.13	10.15		Oracle: 100
CV.1se	139.37	87.46	24.14	167.83	130.85	
CV.min	257.87	171.74	60.9	246.36	254.61	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	197.94	180.1	215.47	206.57		$\rho = 0.9$
AIC	845.72	833.26	834.34	441.87		,
BIC	0.39	1.11	0.23	8.32		Oracle: 100
CV.1se	1.88	0.22	0.02	81.93	1.62	
CV.min	54.98	6.41	0.92	193.49	54.94	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	63.37	99.88	29.39	139.5		$\rho = 0$
AIC	881.36	869.27	889.4	509.19		,
BIC	0.11	0.03	0	0.86		Oracle: 100
CV.1se	1.43	0.09	0.01	82.83	1.02	
CV.min	44.69	5.2	0.7	193.75	44.46	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	54.93	95.46	36.01	139.94		$\rho = 0.5$
AIC	882.37	870.91	889.49	520.33		,
BIC	0.09	0.03	0	0.76		Oracle: 100
CV.1se	0.94	0.05	0.01	79.93	0.68	
CV.min	45.09	5.03	0.74	191.22	42.83	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	56.35	95.23	32.88	137.59		$\rho = 0.9$
AIC	879.67	867.66	886.91	511.9		'
BIC	0.09	0.04	0	0.71		Oracle: 100
	0.07	0.01		V./ 1		

Table 103: Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 10.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	marginal AL	sparsenet MCP	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$							
AIC 610.08 607.83 580.37 52.03 $Oracle: 100$ BIC 30.11 25.35 18.6 25.49 $Oracle: 100$ CV.lse 86.05 59.04 23.03 35.08 19 $Oracle: 100$ CV.min 173.55 132.87 51.75 45.39 30.05 $oracle: 100$ AIC 539.81 539.49 515.13 45.25 $oracle: 100$ BIC 39.2 29.42 16.74 34.1 $Oracle: 100$ CV.lse 150.05 120.12 60.24 11.46 32.46 $oracle: 100$ AIC 243.07 239.05 197.73 12.56 57.98 $oracle: 100$ AIC 243.07 239.05 197.73 12.56 $oracle: 100$ BIC 70.99 57.34 20.8 12.47 $oracle: 100$ AIC 71.49 735.39 707.33 154.27 $oracle: 100$ AIC 78.84 49.84 13.8 97.65 $oracle: 100$ AIC 78.84 49.84 13.8 97.65 $oracle: 100$ AIC 741.49 735.39 707.33 154.27 $oracle: 100$ AIC 19.86 15.71 10.18 18.01 $oracle: 100$ AIC 19.86 15.71 10.18 18.01 $oracle: 100$ AIC 19.86 15.71 10.18 18.01 $oracle: 100$ AIC 11.52 82.06 24.12 112.61 $oracle: 100$ AIC 377.46 388.23 358.14 26.22 BIC 13.6 1.04 1.11 15.95 $oracle: 100$ AIC 377.46 388.23 358.14 26.22 $oracle: 100$ AIC 829.74 821.32 811.77 313.14 $oracle: 100$ AIC 829.74 821.32 811.77 313.14 $oracle: 100$ AIC 67.06 38.82 2.93 141.49 21.83 $oracle: 100$ AIC 829.74 821.32 811.77 313.14 $oracle: 100$ AIC 56.7 24.13 4.05 106.25 $oracle: 100$ AIC 57.75 5.50 5.94 45.93 11.07 139.54 16.12 $oracle: 100$ AIC 57.75 5.76 5.70 64.99 11.						32.54	
BIC 30.11 25.35 18.6 25.49 $Oracle: 100$ CV.1se 86.05 59.04 23.03 35.08 19 $Oracle: 100$ 17.3.55 132.87 51.75 45.39 30.05 $oracle: 100$ 18.6 39.81 539.49 515.13 45.25 $oracle: 100$ 18.6 39.81 539.49 515.13 45.25 $oracle: 100$ 18.6 27.8 18.6 29.42 16.74 34.1 $oracle: 100$ 18.6 27.8 19.6 29.42 16.74 34.1 $oracle: 100$ 19.6 26.5 191.32 98.49 12.56 57.98 $oracle: 100$ 243.07 239.05 197.73 12.56 $oracle: 100$ 243.07 239.05 197.73 12.56 $oracle: 100$ 26.10 243.07 239.05 197.73 12.56 $oracle: 100$ 27.1 19.6 18.1 19.8 12.47 $oracle: 100$ 27.1 19.6 19.6 19.6 19.6 19.5 197.73 12.56 $oracle: 100$ 27.1 19.6 19.6 19.6 19.7 19.7 19.1 19.8 12.47 $oracle: 100$ 27.1 19.8 19.1 19.1				25.64	50.68		$\rho = 0$
Signature Si							$Oracle \cdot 100$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	30.11	25.35	18.6	25.49		Oracic . 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	86.05	59.04	23.03	35.08	19	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	173.55	132.87	51.75	45.39	30.05	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 39.2 29.42 16.74 34.1 Oracle: 100 CV.Ise 150.05 120.12 60.24 11.46 32.46 CV.min 226.55 191.32 98.49 11.56 57.98 $\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ AIC 190.69 161.01 82.82 12.56 $\rho = 0.9$ $\rho = 0.9$ AIC 243.07 239.05 197.73 12.56 $\rho = 0.9$ $\rho = 0.9$ BIC 70.99 57.34 20.8 12.47 $\rho = 0.9$ $\rho = 0.9$ CV.Ise 23.98 18.16 12.49 38.71 11.98 $\rho = 0.9$ CV.min 77.49 53.9 19.15 117.83 25.81 $\rho = 0.9$ AIC 741.49 735.39 707.33 154.27 $\rho = 0.0$ $\rho = 0.0$ AIC 741.49 735.39 707.33 154.27 $\rho = 0.0$ $\rho = 0.0$ V.V.Ise 45.77 31.55 12.77 65.81 12.38 $\rho = 0.0$ <	AICc	146.39	111.64	45.26	45.15		$\rho = 0.5$
BIC 39.2 29.42 16.74 34.1 CV.Isis 150.05 120.12 60.24 11.46 32.46 CV.min 226.55 191.32 98.49 12.56 57.98 sd(μ)/σ = 2 AICc 190.69 161.01 82.82 12.56 $\rho = 0.9$ AIC 243.07 239.05 197.73 12.56 $\rho = 0.9$ BIC 70.99 57.34 20.8 12.47 $\rho = 0.9$ CV.Ise 23.98 18.16 12.49 38.71 11.98 CV.min 77.49 53.9 19.15 117.83 25.81 $sd(μ)/σ = 1$ AIC 741.49 735.39 707.33 154.27 $\rho = 0$ AIC 741.49 735.39 707.33 154.27 $\rho = 0$ CV.lise 45.77 31.55 12.77 65.81 12.38 CV.min 125.9 93.66 27.99 125.2 23.83 $sd(μ)/σ = 1$ AIC 115.2 <t< td=""><td>AIC</td><td>539.81</td><td>539.49</td><td>515.13</td><td>45.25</td><td></td><td>Omagle : 100</td></t<>	AIC	539.81	539.49	515.13	45.25		Omagle : 100
$\begin{array}{c} \text{CV.min} & 226.55 \\ \text{AICc} & 190.69 \\ \text{AIC} & 190.69 \\ \text{AIC} & 243.07 \\ \text{CV.1se} & 239.05 \\ \text{Dracle} & 197.73 \\ \text{CV.min} & 77.49 \\ \text{AIC} & 78.84 \\ \text{AIC} & 49.84 \\ \text{AIC} & 190.69 \\ \text{Dracle} & 197.73 \\ \text{CV.min} & 77.49 \\ \text{AIC} & 78.84 \\ \text{AIC} & 49.84 \\ \text{AIS} & 97.65 \\ \text{AIC} & 78.84 \\ \text{A9.84} & 13.8 \\ \text{AIS} & 97.65 \\ \text{AIC} & 741.49 \\ \text{AIC} & 735.39 \\ \text{AIC} & 10.18 \\ \text{CV.min} & 125.9 \\ \text{AIC} & 15.71 \\ \text{CV.min} & 125.9 \\ \text{BIC} & 19.86 \\ \text{AIC} & 19.82 \\ \text{AIC} & 19.83 \\ \text{AIC} & 19.82 \\ \text{AIC} & 115.2 \\ \text{AIC} & 115.2 \\ \text{AIC} & 19.82 \\ \text{AIC} & 114.65 \\ \text{AIC} & 114.91 \\ \text{AIC} & 114.65 \\ \text{AIC} & 114.91 \\ \text{AIC} & 137.46 \\ \text{ASS.23} & 358.14 \\ \text{ACS} & 26.22 \\ \text{BIC} & 1.36 \\ \text{I.04} & 1.11 \\ \text{I.11} & 15.95 \\ \text{CV.Ise} & 8.78 \\ \text{AIC} & 377.46 \\ \text{ASS.23} & 358.14 \\ \text{ACS} & 28.79 \\ \text{AIC} & 82.974 \\ \text{AII} & 313.14 \\ \text{BIC} & 8.98 \\ \text{ACS} & 1.04 \\ \text{AII} & 11.10 \\ \text{AII} & 15.95 \\ \text{CV.Ise} & 43.3 \\ \text{AIC} & 337.46 \\ \text{ASS.23} & 358.14 \\ \text{ACS} & 26.12 \\ \text{ACS} & 24.13 \\ \text{ALOS} & 106.25 \\ \text{P} = 0.9 \\ \text{AICC} & 82.974 \\ \text{RSI.33} & 5.42 \\ \text{A.17} & 313.14 \\ \text{BIC} & 8.98 \\ \text{A.22} & 1.64 \\ \text{I.10.12} \\ \text{CV.Ise} & 4.33 \\ \text{A.42} & 3.21 \\ \text{S.25.9} & 5.19 \\ \text{CV.Ise} & 4.33 \\ \text{A.42} & 3.21 \\ \text{S.25.9} & 5.19 \\ \text{CV.Ise} & 1.01 \\ \text{AIC} & 798.16 \\ \text{790.33} & 773.25 \\ \text{252.9} \\ \text{BIC} & 2.46 \\ \text{1.78} & 0.96 \\ \text{3.45} \\ \text{CV.Ise} & 1.01 \\ \text{AIC} & 555.11 \\ \text{553.6} & 520.08 \\ \text{64.94} \\ \text{CV.pole} & 10.11 \\ \text{CV.min} & 6.85 \\ \text{55.05} & 52.08 \\ \text{64.94} \\ \text{CV.pole} & 10.01 \\ \text{CV.pole} & 10.0$	BIC	39.2	29.42	16.74	34.1		07 acte . 100
AICc 190.69 161.01 82.82 12.56 $\rho = 0.9$ AIC 243.07 239.05 197.73 12.56 $\rho = 0.9$ BIC 70.99 57.34 20.8 12.47 $\rho = 0.9$ CV.1se 23.98 18.16 12.49 38.71 11.98 $\rho = 0.9$ AIC 741.49 735.39 19.15 117.83 25.81 $\rho = 0.9$ AIC 741.49 735.39 707.33 154.27 $\rho = 0.9$ AIC 19.86 15.71 10.18 18.01 $\rho = 0.9$ AIC 19.86 15.71 10.18 18.01 $\rho = 0.9$ AIC 15.2 82.06 24.12 112.61 $\rho = 0.9$ AIC 15.2 82.06 24.12 112.61 $\rho = 0.9$ AIC 15.2 82.06 24.12 112.61 $\rho = 0.9$ AIC 688.82 683.95 653.03 129.67 $\rho = 0.9$ AIC 19.82 15.2 8.11 24.07 $\rho = 0.9$ AIC 19.82 15.2 8.11 24.07 $\rho = 0.9$ AIC 19.82 15.2 8.11 24.07 $\rho = 0.9$ AIC 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 $\rho = 0.9$ AIC 13.6 1.04 1.11 15.95 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.78 6.97 4.92 44.77 5.07 $\rho = 0.9$ AIC 8.98 6.22 1.64 10.12 $\rho = 0.5$ AIC 8.99.4 821.32 811.77 313.14 $\rho = 0.5$ AIC 6.70 38.82 3.21 52.59 5.19 $\rho = 0.5$ AIC 6.70 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 $\rho = 0.5$ AIC 12.81 1.83 1 153.65 6.99 10.11 $\rho = 0.5$ AIC 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94 $\rho = 0.9$ AIC 12.81 1.80	CV.1se	150.05	120.12	60.24	11.46	32.46	
AIC 243.07 239.05 197.73 12.56 $Oracle:100$	CV.min	226.55	191.32	98.49	12.56	57.98	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 70.99 57.34 20.8 12.47 Oracle: 100 CV.1se 23.98 18.16 12.49 38.71 11.98 $sd(\mu)/\sigma = 1$ CV.min 77.49 53.9 19.15 117.83 25.81 $sd(\mu)/\sigma = 1$ AIC 78.84 49.84 13.8 97.65 $\rho = 0$ AIC 741.49 735.39 707.33 154.27 $\rho = 0$ BIC 19.86 15.71 10.18 18.01 $\rho = 0$ CV.1se 45.77 31.55 12.77 65.81 12.38 CV.min 125.9 93.66 27.99 125.2 23.83 $sd(\mu)/\sigma = 1$ AIC 115.2 82.06 24.12 112.61 $\rho = 0.5$ AIC 688.82 683.95 653.03 129.67 $\rho = 0.5$ BIC 19.82 15.2 8.11 24.07 $\rho = 0.5$ CV.lse 62.14 64.79 38.31 15.38 24.64 CV.min	AICc	190.69	161.01	82.82	12.56		$\rho = 0.9$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AIC	243.07	239.05	197.73	12.56		Omasla . 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	70.99	57.34	20.8	12.47		Oracle: 100
AICc 78.84 49.84 13.8 97.65 $\rho = 0$ AIC 741.49 735.39 707.33 154.27 BIC 19.86 15.71 10.18 18.01 CV.1se 45.77 31.55 12.77 65.81 12.38 CV.min 125.9 93.66 27.99 125.2 23.83 $\mathrm{sd}(\mu)/\sigma = 1$ AICc 115.2 82.06 24.12 112.61 $\rho = 0.5$ AIC 688.82 683.95 653.03 129.67 BIC 19.82 15.2 8.11 24.07 CV.1se 62.14 64.79 38.31 15.38 24.64 CV.min 158.84 137.59 66.38 26.63 50.69 $\mathrm{sd}(\mu)/\sigma = 1$ AICc 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 BIC 1.36 1.04 1.11 15.95 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $\mathrm{sd}(\mu)/\sigma = 0.5$ AIC 829.74 821.32 811.77 313.14 BIC 8.98 6.22 1.64 10.12 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $\mathrm{sd}(\mu)/\sigma = 0.5$ AIC 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 BIC 2.46 1.78 0.96 3.45 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $\mathrm{sd}(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 64.94 Oracle : 100	CV.1se	23.98	18.16	12.49	38.71	11.98	
AICc 78.84 49.84 13.8 97.65 $\rho = 0$ AIC 741.49 735.39 707.33 154.27 BIC 19.86 15.71 10.18 18.01 CV.1se 45.77 31.55 12.77 65.81 12.38 CV.min 125.9 93.66 27.99 125.2 23.83 $sd(\mu)/\sigma = 1$ AICc 115.2 82.06 24.12 112.61 $\rho = 0.5$ AIC 688.82 683.95 653.03 129.67 BIC 19.82 15.2 8.11 24.07 CV.1se 62.14 64.79 38.31 15.38 24.64 CV.min 158.84 137.59 66.38 26.63 50.69 $sd(\mu)/\sigma = 1$ AICc 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 BIC 1.36 1.04 1.11 15.95 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $sd(\mu)/\sigma = 0.5$ AIC 829.74 821.32 811.77 313.14 BIC 8.98 6.22 1.64 10.12 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $sd(\mu)/\sigma = 0.5$ AIC 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 BIC 2.46 1.78 0.96 3.45 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $sd(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 64.94 Oracle : 100	CV.min	77.49	53.9	19.15	117.83	25.81	$\operatorname{sd}(\mu)/\sigma = 1$
BIC 19.86 15.71 10.18 18.01 Oracte: 100 CV.1se 45.77 31.55 12.77 65.81 12.38 $sd(\mu)/\sigma = 1$ CV.min 125.9 93.66 27.99 125.2 23.83 $sd(\mu)/\sigma = 1$ AIC 688.82 683.95 653.03 129.67 Oracle: 100 BIC 19.82 15.2 8.11 24.07 Oracle: 100 CV.1se 62.14 64.79 38.31 15.38 24.64 Oracle: 100 CV.nin 158.84 137.59 66.38 26.63 50.69 $sd(\mu)/\sigma = 1$ AIC 377.46 388.23 358.14 26.22 Oracle: 100 BIC 1.36 1.04 1.11 15.95 Oracle: 100 CV.1se 8.78 6.97 4.92 44.77 5.07 Oracle: 100 CV.nin 48.42 28.79 9.73 141.49 21.83 $sd(\mu)/\sigma = 0.5$ AIC 829.74 821.32 811.77	AICc	78.84	49.84	13.8	97.65		. , , ,
BIC 19.86 15./1 10.18 18.01 CV.1se 45.77 31.55 12.77 65.81 12.38 CV.min 125.9 93.66 27.99 125.2 23.83 $sd(\mu)/\sigma = 1$ AIC 115.2 82.06 24.12 112.61 $\rho = 0.5$ AIC 688.82 683.95 653.03 129.67 Oracle: 100 BIC 19.82 15.2 8.11 24.07 Oracle: 100 CV.1se 62.14 64.79 38.31 15.38 24.64 CV.min 158.84 137.59 66.38 26.63 50.69 $sd(\mu)/\sigma = 1$ AIC 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 Oracle: 100 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $sd(\mu)/\sigma = 0.5$ AIC 829.74	AIC	741.49	735.39	707.33	154.27		0 1 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	19.86	15.71	10.18	18.01		<i>Oracle</i> : 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	45.77	31.55	12.77	65.81	12.38	
AICc 115.2 82.06 24.12 112.61 $\rho = 0.5$ AIC 688.82 683.95 653.03 129.67 $\rho = 0.5$ BIC 19.82 15.2 8.11 24.07 $\rho = 0.5$ CV.1se 62.14 64.79 38.31 15.38 24.64 $\rho = 0.5$ AIC 377.46 388.23 358.14 26.22 $\rho = 0.9$ AIC 1.36 1.04 1.11 15.95 $\rho = 0.9$ AIC 82.74 821.32 811.77 313.14 $\rho = 0.5$ AIC 82.974 821.32 811.77 313.14 $\rho = 0.5$ AIC 82.974 821.32 811.77 313.14 $\rho = 0.5$ AIC 82.974 82.32 811.77 313.14 $\rho = 0.5$ AIC 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 $\rho = 0.5$ AIC 1.01 1 1 12.07 1.21 $\rho = 0.5$ AIC 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 1.81 1.83 1 64.94 $\rho = 0.9$ AIC 1.81 1.81 1.83 1 1 55.68 $\rho = 0.9$ AIC 1.81 1.82 1 1.83 1 1 55.68 $\rho = 0.9$ AIC 1.81 1.83 1 1 55.68 $\rho = 0.9$ AIC 1.81 1.82 1 1.83 1 1 55.68 $\rho = 0.9$ AIC 1.81 1.82 1 1.83 1 1 55.68 $\rho = 0.9$ AIC 1.81 1.82 1 1.83 1 1 55.68 $\rho = 0.$				27.99			$\operatorname{sd}(\mu)/\sigma = 1$
BIC 19.82 15.2 8.11 24.07 CV.1se 62.14 64.79 38.31 15.38 24.64 CV.min 158.84 137.59 66.38 26.63 50.69 $sd(\mu)/\sigma = 1$ AICc 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 BIC 1.36 1.04 1.11 15.95 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $sd(\mu)/\sigma = 0.5$ AICc 56.7 24.13 4.05 106.25 $\rho = 0$ AIC 829.74 821.32 811.77 313.14 BIC 8.98 6.22 1.64 10.12 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $sd(\mu)/\sigma = 0.5$ AICc 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 BIC 2.46 1.78 0.96 3.45 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $sd(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94		115.2	82.06	24.12	112.61		
BIC 19.82 15.2 8.11 24.07 CV.1se 62.14 64.79 38.31 15.38 24.64 CV.min 158.84 137.59 66.38 26.63 50.69 $sd(\mu)/\sigma = 1$ AICc 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 Oracle: 100 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $sd(\mu)/\sigma = 0.5$ AIC 56.7 24.13 4.05 106.25 $\rho = 0$ AIC 829.74 821.32 811.77 313.14 Oracle: 100 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $sd(\mu)/\sigma = 0.5$ AIC 798.16 790.33 773.25 252.9 Oracle: 100 CV.1se 1.01	AIC	688.82	683.95	653.03	129.67		0 1 100
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	19.82	15.2	8.11	24.07		Oracle: 100
AICc 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 BIC 1.36 1.04 1.11 15.95 $\rho = 0.9$ Oracle : 100 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 56.7 24.13 4.05 106.25 $\rho = 0$ AIC 829.74 821.32 811.77 313.14 $\rho = 0.5$ BIC 8.98 6.22 1.64 10.12 $\rho = 0.5$ CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $\rho = 0.5$ AICc 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 $\rho = 0.5$ AIC 1.01 1 1 1 1.00 1.00 1.00 1.00 1.00 1.	CV.1se	62.14	64.79	38.31	15.38	24.64	
AICc 141.65 114.91 50.47 26.13 $\rho = 0.9$ AIC 377.46 388.23 358.14 26.22 BIC 1.36 1.04 1.11 15.95 $\rho = 0.9$ Oracle : 100 CV.1se 8.78 6.97 4.92 44.77 5.07 CV.min 48.42 28.79 9.73 141.49 21.83 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 56.7 24.13 4.05 106.25 $\rho = 0$ AIC 829.74 821.32 811.77 313.14 $\rho = 0.5$ BIC 8.98 6.22 1.64 10.12 $\rho = 0.5$ CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $\rho = 0.5$ AICc 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 $\rho = 0.5$ AIC 1.01 1 1 1 1.00 1.00 1.00 1.00 1.00 1.						50.69	$\operatorname{sd}(\mu)/\sigma = 1$
AIC 377.46 388.23 358.14 26.22 $Oracle:100$ BIC 1.36 1.04 1.11 15.95 $Oracle:100$ CV.1se 8.78 6.97 4.92 44.77 5.07 $Ovacle:100$ CV.min 48.42 28.79 9.73 141.49 21.83 $ovacle:100$ AIC 829.74 821.32 811.77 313.14 $ovacle:100$ BIC 8.98 6.22 1.64 10.12 $ovacle:100$ CV.1se 4.33 5.42 3.21 52.59 5.19 $ovacle:100$ CV.min 56.94 45.93 11.07 139.54 16.12 $ovacle:100$ AIC 798.16 790.33 773.25 252.9 $ovacle:100$ BIC 2.46 1.78 0.96 3.45 $ovacle:100$ CV.1se 1.01 1 1 12.07 1.21 $ovacle:100$ CV.1se 1.01 1 1 12.07 1.21 $ovacle:100$ CV.min 6.85 5.05 2.4 56.99 10.11 $ovacle:100$ AIC 535.11 553.6 520.08 64.94 $ovacle:100$							
BIC 1.36 1.04 1.11 15.95							'
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$							<i>Oracle</i> : 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$						5.07	
AICc 56.7 24.13 4.05 106.25 $\rho = 0$ AIC 829.74 821.32 811.77 313.14 BIC 8.98 6.22 1.64 10.12 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 BIC 2.46 1.78 0.96 3.45 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94							$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 829.74 821.32 811.77 313.14 Oracle : 100 BIC 8.98 6.22 1.64 10.12 Oracle : 100 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 sd(μ)/σ = 0.5 AICc 67.06 38.82 2.93 114.56 ρ = 0.5 AIC 798.16 790.33 773.25 252.9 Oracle : 100 BIC 2.46 1.78 0.96 3.45 Oracle : 100 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 sd(μ)/σ = 0.5 AICc 12.81 1.83 1 55.68 ρ = 0.9 AIC 535.11 553.6 520.08 64.94 Oracle : 100	AICc	56.7	24.13	4.05	106.25		
BIC 8.98 6.22 1.64 10.12 CV.1se 4.33 5.42 3.21 52.59 5.19 CV.min 56.94 45.93 11.07 139.54 16.12 $sd(\mu)/\sigma = 0.5$ AICc 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 Oracle: 100 BIC 2.46 1.78 0.96 3.45 Oracle: 100 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $sd(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94 Oracle: 100	AIC	829.74	821.32	811.77	313.14		0 1 100
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	8.98	6.22	1.64	10.12		<i>Oracle</i> : 100
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	4.33	5.42		52.59	5.19	
AICc 67.06 38.82 2.93 114.56 $\rho = 0.5$ AIC 798.16 790.33 773.25 252.9 BIC 2.46 1.78 0.96 3.45 $\rho = 0.5$ CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $\rho = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94			45.93	11.07	139.54	16.12	$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 798.16 790.33 773.25 252.9 BIC 2.46 1.78 0.96 3.45 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $sd(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94							
BIC 2.46 1.78 0.96 3.45 Oracle: 100 CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $sd(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94 Oracle: 100							
CV.1se 1.01 1 1 12.07 1.21 CV.min 6.85 5.05 2.4 56.99 10.11 $sd(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94							<i>Oracle</i> : 100
CV.min 6.85 5.05 2.4 56.99 10.11 $\operatorname{sd}(\mu)/\sigma = 0.5$ AICc 12.81 1.83 1 55.68 $\rho = 0.9$ AIC 535.11 553.6 520.08 64.94						1.21	
AICc 12.81 1.83 1 55.68 AIC 535.11 553.6 520.08 64.94 $\rho = 0.9$							$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC 535.11 553.6 520.08 64.94 Oracle : 100							\ ' / /
1.50 1.00 1 2.07	BIC	1.36	1.03	1	2.67		<i>Oracle</i> : 100

Table 104: Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	177.38	131.7	74.1	139.2	83.5	
CV.min	275.72	210.8	97.57	203.17	139.13	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	212.26	171.93	108.71	182.62		$\rho = 0$
AIC	741.02	732.57	703.83	242.07		Oracle: 100
BIC	95.76	78.13	54.98	87.86		07 acic . 100
CV.1se	284.92	221.99	104.54	200.39	91.86	
CV.min	390.74	318.95	154.52	253.92	139.8	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	283.84	240.7	155.72	232.46		$\rho = 0.5$
AIC	719.34	711.54	681.23	267.94		Oracle: 100
BIC	62.29	84.45	62.49	91.74		Oracie . 100
CV.1se	342.59	289.9	175.27	48.48	139.78	
CV.min	426.59	380.66	224.62	62.76	179.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	323.91	291.1	206.31	62.23		$\rho = 0.9$
AIC	432.07	415.11	370.19	62.42		Oracle: 100
BIC	1.55	1.06	4.77	34.2		Oracie . 100
CV.1se	93.83	63.48	33.21	117.33	61.69	
CV.min	191.52	129.04	51.84	200.59	145.7	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	156.08	118.76	84.3	163.3		$\rho = 0$
AIC	822.66	811.93	802.09	348.76		0
BIC	26.51	23.2	1.76	42.37		Oracle: 100
CV.1se	116.23	101.52	43.51	150.2	57.17	
CV.min	248.97	201.84	79.21	228.54	105.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	188.55	164.27	129.46	198.09		$\rho = 0.5$
AIC	811.45	802.63	786.48	377.81		Oma ala . 100
BIC	1.34	0.96	0.16	4.54		Oracle: 100
CV.1se	16.24	49.35	37.22	47.73	92.25	
CV.min	110.88	164.45	92.11	90.68	141.73	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	77.11	65.1	63.49	88.14		$\rho = 0.9$
AIC	564.08	550.45	509.2	94.01		0
BIC	1.46	1.06	1	3.43		Oracle: 100
CV.1se	5.04	1.84	0.27	78.71	3.9	
CV.min	67.7	25	3.78	182.97	65.96	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	73.06	29.17	0.23	135.27		$\rho = 0$
AIC	872.57	861.49	872.49	464.17		Oracle: 100
BIC	0.42	0.1	0	2.77		Oracie: 100
CV.1se	0.13	0.06	0.02	43.35	0.49	
CV.min	14.69	7.95	0.88	147.92	13.99	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	30.49	3.35	0.77	112.34		$\rho = 0.5$
AIC	864.61	855.17	859.36	476.25		0
BIC	0.17	0.07	0	0.7		Oracle: 100
CV.1se	0.17	0.19	0.28	3.68	0.45	
CV.min	7.69	4.71	1.41	51.18	2.9	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	12.68	1.51	0.94	56.79		$\rho = 0.9$
AIC	692.69	673.84	660.71	101.17		,
BIC	1.3	1.01	0.74	1.5		Oracle: 100

Table 105: Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}~\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	216.7	158.99	101.3	173.7	101.8	
CV.min	312.77	230.16	117.75	232.7	132.73	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	238.55	186.96	107.23	207.88		$\rho = 0$
AIC	767.5	757.71	734.48	297.7		Oracle: 100
BIC	136.65	112.43	87.7	125.42		07 acic . 100
CV.1se	351.92	280.15	152.5	261.44	138.66	
CV.min	448.81	363.11	190.88	328	170.95	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	332.16	280.87	159.41	287.02		$\rho = 0.5$
AIC	760.54	751.67	726.14	361.97		Oracle: 100
BIC	1.19	6.74	120.59	12.88		07acic . 100
CV.1se	409.63	353.68	229.43	68.54	198.23	
CV.min	490.29	435.49	269.98	105.81	229.09	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	373.98	338.52	227.04	102.44		$\rho = 0.9$
AIC	496.49	474.8	427.14	106.07		Oracle: 100
BIC	2.07	1.34	2.69	5.12		07 acte . 100
CV.1se	121.2	79.38	35.15	149.49	107.9	
CV.min	229.92	153.4	64.98	231.73	221.09	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	180.82	144.1	136.48	189.01		$\rho = 0$
AIC	838.97	826.44	824.64	408.23		0
BIC	1.65	2.86	0.11	31.63		Oracle: 100
CV.1se	75.16	77.87	8.87	160.02	77.52	
CV.min	252.28	210.01	41.08	248.98	158.93	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	175.12	184.13	177.3	207.76		$\rho = 0.5$
AIC	836.61	826.58	817.29	462.59		Oracle: 100
BIC	0.38	0.2	0	1.65		Oracie: 100
CV.1se	1.15	3.51	0.81	32.58	21.48	
CV.min	19.35	34.54	3.75	97.19	72.07	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	21.41	6.15	13.14	101.16		$\rho = 0.9$
AIC	626.79	608.57	575.17	142.13		Oracle: 100
BIC	1.67	1.15	0.99	1.86		Oracie: 100
CV.1se	2.53	0.45	0.06	83.46	1.85	
CV.min	58.87	10.96	1.34	192.27	60.1	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	67.63	21.93	1.15	139.02		$\rho = 0$
AIC	878.63	867.27	884.18	495.35		Oracle: 100
BIC	0.16	0.01	16.91	1.21		Oracie: 100
CV.1se	0.01	0	0	36.25	0.46	
CV.min	10.17	3.22	0.36	140.85	10.11	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	22.94	0.87	0.43	105.6		$\rho = 0.5$
AIC	870.74	859.63	869.23	510.63		Oracle: 100
BIC	0.06	0.02	0	0.38		Oracle: 100
CV.1se	0.04	0.05	0.08	1.22	0.44	
CV.min	8.2	4.73	1.42	36.78	4.99	$sd(\mu)/\sigma = 0.5$
AICc	14.12	1.34	0.47	40.6		$\rho = 0.9$
AIC	736.73	715.86	715.33	93.56		Oracle: 100
BIC	0.88	0.66	0.14	1.32		Oracle: 100
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Table 106: Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\ \gamma=10$	marginal AL	sparsenet MCP	
CV.1se	224.63	155.19	105.5	181.42	102.74	
CV.min	318.5	217.92	114.43	236.28	116.28	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	241.9	179.16	101.41	213.12		$\rho = 0$
AIC	777.82	767.04	748.05	317.5		Oracle: 100
BIC	150.79	120.13	98.02	141.96		07acie . 100
CV.1se	368.76	279.52	144.89	287.33	113.1	
CV.min	460.6	352.01	163.65	357.34	126.15	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	341.81	272.18	128.97	309.03		$\rho = 0.5$
AIC	776.77	767.31	744.78	401.13		Oracle: 100
BIC	0.52	15.34	123.67	3.36		Oracie : 100
CV.1se	434.56	363.17	226.51	86.17	186.96	
CV.min	518.82	437.77	250.23	144.27	211.49	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	391.51	338.85	201.81	138.83		$\rho = 0.9$
AIC	533.99	511.1	466.14	149.71		Omasla . 100
BIC	2.86	1.9	51.45	2.99		Oracle: 100
CV.1se	132.12	82.35	29.31	162.1	127.28	
CV.min	244.8	158.63	64.23	242.68	244.45	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	192.86	152.89	145.25	200.17		$\rho = 0$
AIC	845.23	831.63	834.85	433.28		,
BIC	0.51	0.42	0.06	16		Oracle: 100
CV.1se	39.08	39.47	0.84	157.52	43.03	
CV.min	217.3	167.02	6.82	252.89	178.42	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	140.57	184.71	200.87	206.66		$\rho = 0.5$
AIC	844.4	833.66	828.74	492.97		,
BIC	0.17	0.07	0	1.01		Oracle: 100
CV.1se	0.76	0.77	0.52	17.07	2.19	
CV.min	15.64	13.74	2.38	88.07	15.8	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	20.44	4.15	9.33	95.41		$\rho = 0.9$
AIC	663.89	643.78	617.88	192.64		,
BIC	2.14	1.41	0.87	2.52		Oracle: 100
CV.1se	1.82	0.18	0.03	84.71	1.36	
CV.min	54.45	6.51	1.01	194.39	54.99	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	63.21	17.4	0	139.85		$\rho = 0$
AIC	880.57	868.78	888.79	509.84		·
BIC	0.1	0	171.44	0.9		Oracle: 100
CV.1se	0.01	0.01	0	34.1	0.45	
CV.min	9.14	2.15	0.33	138.25	9.14	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	20.94	0.44	0	102.34		$\rho = 0.5$
AIC	871.94	859.89	873.45	519.26		,
BIC	0.06	0.01	0	0.29		Oracle: 100
CV.1se	0.03	0.03	0.04	1.03	0.45	
CV.min	8.37	4.41	1.28	32.84	6	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	14.04	1.13	0.16	35.73	Ü	$\rho = 0.9$
AIC	757.48	735.05	742.32	103.11		,
BIC	0.55	0.36	0.03	1.11		Oracle: 100
	0.55	0.50	0.05	1,11		

Table 107: FDR | Sensitivity for n=100, binary design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.32 0.24	0.20 0.21	0.04 0.10	0.74 0.44	0.18 0.21	
CV.min	0.74 0.46	0.57 0.39	0.17 0.19	0.84 0.51	0.54 0.40	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.59 0.37	0.44 0.34	0.82 0.42	0.68 0.40	•	$\rho = 0$
AIC	0.89 0.59	0.88 0.55	0.88 0.44	0.87 0.54		= 21.2
BIC	0.89 0.58	0.88 0.55	0.88 0.44	0.84 0.52		$\bar{s}_{Oracle} = 21.3$
CV.1se	0.29 0.18	0.20 0.17	0.04 0.09	0.76 0.42	0.15 0.18	
CV.min	0.72 0.41	0.57 0.35	0.17 0.17	0.86 0.49	0.49 0.35	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.60 0.33	0.45 0.31	0.83 0.40	0.70 0.37	'	$\rho = 0.5$
AIC	0.90 0.57	0.89 0.54	0.89 0.43	0.88 0.52		
BIC	0.90 0.56	0.89 0.54	0.89 0.43	0.86 0.50		$\bar{s}_{Oracle} = 20.9$
CV.1se	0.28 0.17	0.19 0.15	0.04 0.08	0.77 0.40	0.17 0.17	
CV.min	0.74 0.39	0.57 0.32	0.16 0.15	0.86 0.47	0.50 0.32	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.62 0.30	0.46 0.29	0.84 0.38	0.72 0.35	ı	$\rho = 0.9$
AIC	0.90 0.55	0.89 0.52	0.89 0.41	0.89 0.49		
BIC	0.90 0.55	0.89 0.52	0.89 0.40	0.86 0.48		$\bar{s}_{Oracle} = 20.7$
CV.1se	0.10 0.05	0.06 0.03	0.02 0.02	0.85 0.42	0.16 0.05	
CV.min	0.57 0.25	0.35 0.14	0.12 0.05	0.91 0.49	0.51 0.23	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.55 0.23	0.46 0.21	0.93 0.29	0.78 0.34	3.000 3.000	$\rho = 0$
AIC	0.94 0.54	0.94 0.46	0.94 0.31	0.93 0.51		,
BIC	0.93 0.54	0.94 0.46	0.94 0.30	0.92 0.51		$\bar{s}_{Oracle} = 14.5$
CV.1se	0.08 0.03	0.05 0.02	0.02 0.02	0.86 0.40	0.15 0.04	
CV.rise CV.min	0.56 0.22	0.34 0.13	0.12 0.05	0.92 0.47	0.51 0.20	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.20	0.45 0.17	0.93 0.28	0.80 0.31	0.21 0.20	$\rho = 0.5$
AIC	0.94 0.51	0.94 0.44	0.95 0.20	0.93 0.48		,
BIC	0.94 0.51	0.94 0.44	0.95 0.30	0.93 0.48		$\bar{s}_{Oracle} = 14.4$
CV.1se	0.08 0.03	0.06 0.03	0.02 0.02	0.86 0.38	0.17 0.05	
CV.13C	0.58 0.21	0.35 0.12	0.02 0.02	0.92 0.46	0.53 0.19	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58 0.19	0.42 0.16	0.13 0.03	0.81 0.30	0.55 0.17	$\rho = 0.9$
AIC	0.94 0.51	0.42 0.10	0.95 0.27	0.93 0.47		
BIC	0.94 0.51	0.94 0.43	0.95 0.29	0.93 0.47		$\bar{s}_{Oracle} = 14.1$
CV.1se	0.03 0.01	0.01 0.00	0.01 0.00	0.94 0.34	0.30 0.02	
CV.13C	0.43 0.10	0.01 0.00	0.01 0.00	0.96 0.42	0.55 0.10	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.55 0.11	0.79 0.19	0.98 0.20	0.91 0.23	0.55 0.10	$\rho = 0$
AIC	0.97 0.46	0.75 0.15	0.98 0.22	0.97 0.44		$\rho = 0$
BIC	0.97 0.46	0.97 0.34	0.98 0.22	0.97 0.44		$\bar{s}_{Oracle} = 7.8$
CV.1se	0.03 0.01	0.02 0.01	0.02 0.00	0.94 0.32	0.30 0.01	
CV.1se CV.min	0.03 0.01	0.02 0.01	0.02 0.00	0.94 0.32	0.58 0.09	$sd(\mu)/\sigma = 0.5$
AICc	0.45 0.09	0.23 0.03	0.12 0.01	0.90 0.40	0.38 0.09	$\rho = 0.5$
	,			,		$\rho = 0.5$
AIC	0.97 0.43	$0.98 \mid 0.32$	0.98 0.20	$0.97 \mid 0.42$		$\bar{s}_{Oracle} = 8.0$
BIC	0.97 0.43	0.98 0.31	0.98 0.20	0.97 0.42	0.21 0.02	
CV.1se	0.03 0.01	$0.03 \mid 0.00$	$0.02 \mid 0.00$	0.94 0.32	0.31 0.02	ad(u)/= 05
CV.min	0.45 0.10	0.21 0.03	$0.10 \mid 0.02$	$0.97 \mid 0.39$	0.61 0.10	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.57 0.10	$0.71 \mid 0.17$	0.98 0.19	$0.92 \mid 0.23$		$\rho = 0.9$
AIC	0.97 0.45	0.98 0.33	0.98 0.21	0.97 0.41		$\bar{s}_{Oracle} = 7.6$
BIC	0.97 0.44	0.98 0.33	0.98 0.20	0.97 0.41		

Table 108: FDR | Sensitivity for n=100, binary design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.07 0.01	0.02 0.00	0.02 0.00	0.79 0.19	0.21 0.01	
CV.min	0.46 0.07	$0.18 \mid 0.01$	$0.08 \mid 0.01$	0.84 0.25	0.53 0.08	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47 0.05	0.77 0.12	0.89 0.11	0.72 0.11		$\rho = 0$
AIC	0.86 0.29	0.88 0.21	0.90 0.13	$0.85 \mid 0.26$		56.9
BIC	0.86 0.29	$0.88 \mid 0.20$	0.90 0.13	$0.85 \mid 0.26$		$\bar{s}_{Oracle} = 56.8$
CV.1se	0.05 0.00	0.02 0.00	0.01 0.00	0.80 0.17	0.20 0.01	
CV.min	0.45 0.06	0.20 0.01	$0.08 \mid 0.00$	0.84 0.23	0.50 0.06	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.48 0.04	0.76 0.11	0.89 0.11	0.74 0.11		$\rho = 0.5$
AIC	0.87 0.28	0.88 0.20	0.91 0.12	0.86 0.25		= 560
BIC	0.87 0.28	0.88 0.20	0.91 0.12	0.86 0.25		$\bar{s}_{Oracle} = 56.2$
CV.1se	0.05 0.01	0.03 0.00	0.01 0.00	0.80 0.16	0.22 0.01	
CV.min	0.44 0.06	0.21 0.01	0.10 0.00	0.85 0.22	0.51 0.06	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.48 0.04	0.73 0.10	0.90 0.10	0.76 0.10	'	$\rho = 0.9$
AIC	0.87 0.27	0.89 0.20	0.91 0.12	0.86 0.24		
BIC	0.87 0.27	0.89 0.19	0.91 0.12	0.86 0.24		$\bar{s}_{Oracle} = 56.5$
CV.1se	0.04 0.00	0.01 0.00	0.01 0.00	0.88 0.19	0.28 0.01	
CV.min	0.43 0.05	0.18 0.01	0.09 0.00	0.91 0.25	0.55 0.05	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.52 0.04	0.90 0.13	0.94 0.11	0.84 0.11	0.00 0.00	$\rho = 0$
AIC	0.92 0.30	0.94 0.20	0.95 0.12	0.92 0.27		'
BIC	0.92 0.29	0.94 0.20	0.95 0.12	0.92 0.27		$\bar{s}_{Oracle} = 31.7$
CV.1se	0.03 0.00	0.03 0.00	0.01 0.00	0.89 0.17	0.27 0.01	
CV.rise CV.min	0.43 0.04	0.21 0.01	0.08 0.00	0.92 0.23	0.54 0.04	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.52 0.04	0.90 0.12	0.94 0.11	0.85 0.11	0.51 0.01	$\rho = 0.5$
AIC	0.93 0.28	0.94 0.19	0.95 0.11	0.92 0.25		$\rho = 0.8$
BIC	0.93 0.28	0.94 0.19	0.95 0.12	0.92 0.25		$\bar{s}_{Oracle} = 31.4$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.89 0.17	0.26 0.01	
CV.1sc CV.min	0.03 0.00	0.02 0.00	0.01 0.00	0.92 0.17	0.55 0.04	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.42 0.04	0.20 0.01	0.10 0.00	0.92 0.23	0.55 0.04	$\rho = 0.9$
AICC	0.93 0.04	0.89 0.12	0.95 0.10	0.93 0.25		$\rho = 0.9$
BIC	0.93 0.27	0.94 0.19	0.95 0.12	0.93 0.23		$\bar{s}_{Oracle} = 31.0$
		<u>'</u>			0.21 0.01	
CV.1se	0.03 0.00	0.01 0.00	0.02 0.00	0.96 0.19	0.31 0.01	ad()/- 05
CV.min	0.40 0.04	$0.16 \mid 0.01$	$0.10 \mid 0.00$	0.98 0.25	0.61 0.04	$\operatorname{sd}(\mu)/\sigma = 0.5$
AIC	0.57 0.04	0.98 0.13	0.98 0.11	0.94 0.11		$\rho = 0$
AIC	0.98 0.29	0.98 0.18	0.99 0.12	0.98 0.27		$\bar{s}_{Oracle} = 8.5$
BIC	0.98 0.29	0.98 0.17	0.99 0.12	0.98 0.27	0.24 0.01	
CV.1se	0.01 0.00	0.02 0.00	0.01 0.00	0.97 0.18	0.34 0.01	1/)/
CV.min	0.42 0.03	0.16 0.01	0.10 0.00	0.98 0.24	0.59 0.03	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.53 0.03	0.98 0.13	0.98 0.12	0.94 0.11		$\rho = 0.5$
AIC	0.98 0.28	0.98 0.18	0.99 0.13	0.98 0.26		$\bar{s}_{Oracle} = 8.9$
BIC	0.98 0.28	0.98 0.18	0.98 0.13	0.98 0.26		- Oracle
CV.1se	0.02 0.00	0.01 0.00	0.01 0.00	0.96 0.18	0.33 0.01	
CV.min	0.41 0.04	0.18 0.01	0.10 0.01	0.98 0.25	0.62 0.04	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.59 0.04	0.98 0.13	0.99 0.12	0.95 0.12		$\rho = 0.9$
AIC	0.98 0.29	0.98 0.19	0.99 0.12	0.98 0.27		$\bar{s}_{Oracle} = 8.1$
BIC	0.98 0.29	0.98 0.18	0.99 0.12	0.98 0.27		Oracle 3.1

Table 109: FDR | Sensitivity for n=100, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.05 0.00	0.02 0.00	0.01 0.00	0.80 0.13	0.24 0.00	
CV.min	0.42 0.04	0.16 0.01	0.09 0.00	0.83 0.18	0.53 0.04	$sd(\mu)/\sigma = 2$
AICc	0.45 0.03	0.83 0.10	0.88 0.09	0.75 0.07		$\rho = 0$
AIC	0.85 0.23	0.87 0.15	0.89 0.10	0.84 0.20		- 70.1
BIC	0.85 0.23	0.87 0.15	0.89 0.10	0.84 0.20		$\bar{s}_{Oracle} = 78.1$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.81 0.12	0.22 0.00	
CV.min	0.43 0.03	0.18 0.00	0.09 0.00	0.84 0.17	0.51 0.03	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47 0.02	0.84 0.09	0.89 0.08	0.76 0.07	,	$\rho = 0.5$
AIC	0.86 0.21	0.88 0.15	0.89 0.10	0.85 0.19		•
BIC	0.86 0.21	0.88 0.14	0.89 0.10	0.85 0.19		$\bar{s}_{Oracle} = 77.8$
CV.1se	0.04 0.00	0.03 0.00	0.01 0.00	0.81 0.12	0.26 0.00	
CV.min	0.44 0.03	0.20 0.00	0.09 0.00	0.84 0.17	0.55 0.03	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.51 0.02	0.84 0.09	0.89 0.08	0.77 0.06	0.00 0.00	$\rho = 0.9$
AIC	0.86 0.21	0.88 0.14	0.89 0.10	0.85 0.19		,
BIC	0.86 0.21	0.88 0.14	0.89 0.09	0.85 0.18		$\bar{s}_{Oracle} = 77.2$
CV.1se	0.04 0.00	0.01 0.00	0.01 0.00	0.90 0.14	0.32 0.00	
CV.min	0.45 0.04	0.16 0.00	0.10 0.00	0.92 0.19	0.60 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.55 0.03	0.93 0.10	0.94 0.09	0.86 0.07	0.00 0.03	$\rho = 0$
AIC	0.93 0.03	0.94 0.15	0.95 0.10	0.92 0.21		$\rho = 0$
BIC	0.93 0.23	0.94 0.13	0.95 0.10	0.92 0.21		$\bar{s}_{Oracle} = 38.0$
CV.1se	0.04 0.00	0.02 0.00	0.02 0.00	0.90 0.13	0.33 0.00	
CV.1sc CV.min	0.42 0.03	0.02 0.00	0.02 0.00	0.90 0.13	0.59 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	$0.42 \mid 0.03$ $0.52 \mid 0.02$	0.10 0.00	0.05 0.00	0.88 0.07	0.57 0.05	$\rho = 0.5$
AIC	0.93 0.23	0.94 0.15	0.95 0.09	0.93 0.20		$\rho = 0.5$
BIC	0.93 0.23	0.94 0.15	0.95 0.10	0.93 0.20		\bar{s}_{Oracle} = 36.9
CV.1se	0.93 0.23	0.01 0.00	0.93 0.10	0.90 0.13	0.29 0.01	
CV.1se CV.min	0.03 0.00	0.01 0.00		'	0.58 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
			$0.10 \mid 0.00$,	0.36 0.03	
AIC	$0.56 \mid 0.02$	0.93 0.10	0.95 0.09	$0.87 \mid 0.07$		$\rho = 0.9$
AIC	0.93 0.23	0.94 0.15	0.95 0.10	0.93 0.20		$\bar{s}_{Oracle} = 37.1$
BIC	0.93 0.23	0.94 0.15	0.95 0.10	0.93 0.20	0.24 0.00	
CV.1se	$0.02 \mid 0.00$	0.01 0.00	0.02 0.00	0.97 0.15	0.34 0.00	-1()/- 0.5
CV.min	0.41 0.03	0.15 0.00	$0.09 \mid 0.00$	0.98 0.21	0.62 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.57 0.02	0.99 0.10	0.99 0.09	0.96 0.07		$\rho = 0$
AIC	0.99 0.26	0.99 0.14	0.99 0.10	0.98 0.23		$\bar{s}_{Oracle} = 6.6$
BIC	0.99 0.26	0.99 0.14	0.99 0.10	0.98 0.23	0.07.1.0.04	
CV.1se	0.02 0.00	0.01 0.00	0.01 0.00	0.97 0.15	0.35 0.01	1/) / 0.7
CV.min	0.43 0.02	0.15 0.00	0.09 0.00	0.98 0.20	0.61 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.58 0.03	0.99 0.10	0.99 0.09	0.95 0.09		$\rho = 0.5$
AIC	0.99 0.24	0.99 0.14	0.99 0.10	0.98 0.22		$\bar{s}_{Oracle} = 6.9$
BIC	0.99 0.24	0.99 0.14	0.99 0.10	0.98 0.22		ooracie o.,
CV.1se	0.03 0.00	0.01 0.00	0.02 0.00	0.97 0.14	0.34 0.00	
CV.min	0.43 0.03	0.16 0.00	$0.09 \mid 0.00$	0.98 0.20	0.63 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 0.03	0.99 0.11	$0.99 \mid 0.10$	$0.96 \mid 0.08$		$\rho = 0.9$
AIC	0.99 0.25	0.99 0.15	0.99 0.11	0.98 0.23		$\bar{s}_{Oracle} = 6.4$
BIC	0.99 0.25	0.99 0.15	0.99 0.11	0.98 0.23		Oracle - 0.4

Table 110: FDR | Sensitivity for n=100, binary design, dense covariates, and decay 200.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.05 0.00	0.01 0.00	0.02 0.00	0.83 0.10	0.27 0.00	
CV.min	0.43 0.03	$0.16 \mid 0.00$	$0.09 \mid 0.00$	0.85 0.14	0.57 0.03	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.50 0.02	$0.86 \mid 0.07$	$0.88 \mid 0.07$	$0.79 \mid 0.05$		$\rho = 0$
AIC	$0.86 \mid 0.18$	0.88 0.12	$0.89 \mid 0.08$	0.85 0.16		$\bar{s}_{Oracle} = 91.2$
BIC	$0.86 \mid 0.18$	0.88 0.12	$0.89 \mid 0.08$	0.85 0.15		SOracle - 91.2
CV.1se	0.03 0.00	0.02 0.00	0.02 0.00	0.83 0.09	0.26 0.00	
CV.min	0.42 0.02	0.16 0.00	0.10 0.00	0.85 0.14	0.55 0.02	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.50 0.01	0.87 0.07	0.89 0.07	$0.79 \mid 0.05$		$\rho = 0.5$
AIC	0.86 0.18	0.88 0.12	0.89 0.08	0.86 0.15		- 00.0
BIC	0.86 0.18	0.88 0.12	0.89 0.08	0.86 0.15		$\bar{s}_{Oracle} = 90.8$
CV.1se	0.04 0.00	0.02 0.00	0.02 0.00	0.83 0.09	0.29 0.00	
CV.min	0.44 0.02	0.18 0.00	0.11 0.00	0.85 0.13	0.58 0.02	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.53 0.01	0.87 0.07	0.89 0.07	0.81 0.04	,	$\rho = 0.9$
AIC	0.86 0.17	0.88 0.12	0.89 0.08	0.86 0.15		- 00.2
BIC	0.86 0.17	0.88 0.11	0.89 0.08	0.86 0.15		$\bar{s}_{Oracle} = 90.3$
CV.1se	0.03 0.00	0.01 0.00	0.01 0.00	0.91 0.11	0.34 0.00	
CV.min	0.44 0.03	0.15 0.00	0.10 0.00	0.93 0.16	0.64 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.55 0.02	0.94 0.08	0.95 0.08	0.90 0.06	ı	$\rho = 0$
AIC	0.94 0.20	0.94 0.12	0.95 0.08	0.93 0.17		,
BIC	0.94 0.20	0.95 0.12	0.95 0.08	0.93 0.17		$\bar{s}_{Oracle} = 41.6$
CV.1se	0.03 0.00	0.02 0.00	0.02 0.00	0.92 0.11	0.32 0.00	
CV.min	0.45 0.02	0.17 0.00	0.09 0.00	0.93 0.16	0.62 0.02	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.02	0.94 0.08	0.95 0.08	0.90 0.05	ı	$\rho = 0.5$
AIC	0.94 0.20	0.94 0.12	0.95 0.09	0.94 0.17		
BIC	0.94 0.19	0.94 0.12	0.95 0.09	0.94 0.17		$\bar{s}_{Oracle} = 41.3$
CV.1se	0.04 0.00	0.01 0.00	0.01 0.00	0.92 0.11	0.33 0.00	
CV.min	0.46 0.02	0.19 0.00	0.11 0.00	0.93 0.15	0.62 0.02	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.02	0.94 0.08	0.95 0.08	0.90 0.06	313- 313-	$\rho = 0.9$
AIC	0.94 0.20	0.95 0.13	0.95 0.09	0.94 0.17		,
BIC	0.94 0.20	0.95 0.12	0.95 0.09	0.94 0.17		$\bar{s}_{Oracle} = 40.7$
CV.1se	0.03 0.00	0.01 0.00	0.01 0.00	0.98 0.11	0.35 0.00	
CV.min	0.42 0.02	0.14 0.00	0.09 0.00	0.99 0.18	0.62 0.02	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.57 0.02	0.99 0.08	0.99 0.08	0.97 0.06	ı	$\rho = 0$
AIC	0.99 0.24	0.99 0.11	0.99 0.08	0.99 0.20		,
BIC	0.99 0.24	0.99 0.10	0.99 0.08	0.99 0.20		$\bar{s}_{Oracle} = 5.1$
CV.1se	0.03 0.00	0.01 0.00	0.01 0.00	0.98 0.13	0.36 0.00	
CV.min	0.44 0.02	0.14 0.00	0.08 0.00	0.99 0.18	0.64 0.02	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.57 0.03	0.99 0.09	0.99 0.09	0.97 0.07	****	$\rho = 0.5$
AIC	0.99 0.21	0.99 0.12	0.99 0.09	0.99 0.20		
BIC	0.99 0.21	0.99 0.12	0.99 0.09	0.99 0.20		$\bar{s}_{Oracle} = 5.6$
CV.1se	0.02 0.00	0.01 0.00	0.01 0.00	0.97 0.13	0.35 0.01	
CV.rise CV.min	0.44 0.02	0.17 0.01	0.09 0.00	0.99 0.19	0.65 0.03	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.58 0.03	0.99 0.10	0.99 0.09	0.97 0.07	0.02 0.02	$\rho = 0.9$
AIC	0.99 0.23	0.99 0.13	0.99 0.10	0.99 0.21		
BIC	0.99 0.23	0.99 0.13	0.99 0.10	0.99 0.21		$\bar{s}_{Oracle} = 5.2$
	0.77 0.23	0.77 0.12	0.77 0.10	0.77 0.21		

Table 111: FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.29 0.23	0.17 0.19	0.03 0.10	0.73 0.45	0.17 0.20	
CV.min	0.72 0.46	0.54 0.38	$0.15 \mid 0.19$	$0.84 \mid 0.52$	0.52 0.39	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 0.37	0.24 0.25	$0.80 \mid 0.41$	$0.67 \mid 0.40$		$\rho = 0$
AIC	$0.89 \mid 0.59$	$0.88 \mid 0.56$	$0.88 \mid 0.44$	$0.87 \mid 0.54$		= -20.7
BIC	0.89 0.59	0.88 0.56	0.88 0.44	0.84 0.53		$\bar{s}_{Oracle} = 20.7$
CV.1se	0.08 0.03	0.07 0.03	0.02 0.03	0.85 0.19	0.10 0.06	
CV.min	0.62 0.12	0.51 0.10	0.14 0.06	0.92 0.25	0.39 0.12	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.11	0.17 0.06	0.70 0.18	0.84 0.15	'	$\rho = 0.5$
AIC	0.94 0.34	0.94 0.32	0.94 0.25	0.94 0.28		
BIC	0.94 0.33	0.94 0.32	0.94 0.25	0.86 0.26		$\bar{s}_{Oracle} = 20.4$
CV.1se	0.06 0.06	0.04 0.06	0.01 0.06	0.54 0.16	0.01 0.06	
CV.min	0.63 0.08	0.51 0.07	0.14 0.06	0.81 0.32	0.23 0.06	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.65 0.08	0.14 0.06	0.00 0.06	0.76 0.22	0.20 0.00	$\rho = 0.9$
AIC	0.97 0.19	0.97 0.17	0.97 0.14	0.86 0.44		
BIC	0.84 0.16	0.87 0.17	0.97 0.14	0.26 0.09		$\bar{s}_{Oracle} = 18.3$
CV.1se	0.09 0.05	0.05 0.04	0.02 0.02	0.84 0.42	0.12 0.05	
CV.1sc CV.min	0.54 0.24	0.03 0.04	0.02 0.02	0.64 0.42	0.50 0.23	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.57 0.23	0.33 0.14	0.10 0.00	0.78 0.34	0.30 0.23	$\beta \sin(\mu)/\theta = 1$ $\rho = 0$
			0.93 0.28	,		$\rho = 0$
AIC	0.93 0.55	0.94 0.46				$\bar{s}_{Oracle} = 14.4$
BIC	0.93 0.54	0.94 0.46	0.94 0.30	0.92 0.51	0.17 0.02	
CV.1se	0.04 0.01	0.03 0.01	0.02 0.01	0.89 0.19	0.15 0.03	1/)/ 1
CV.min	0.50 0.09	0.37 0.06	0.13 0.03	0.95 0.26	0.47 0.08	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.59 0.09	0.10 0.03	0.94 0.17	0.87 0.14		$\rho = 0.5$
AIC	0.96 0.32	0.96 0.28	0.97 0.20	0.96 0.28		$\bar{s}_{Oracle} = 14.2$
BIC	0.96 0.32	0.96 0.28	0.97 0.20	0.95 0.28		*Oracle
CV.1se	$0.06 \mid 0.08$	$0.04 \mid 0.08$	$0.01 \mid 0.09$	$0.44 \mid 0.14$	0.01 0.09	
CV.min	0.64 0.14	0.51 0.11	$0.14 \mid 0.10$	$0.86 \mid 0.24$	0.22 0.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.65 0.13	0.13 0.10	$0.02 \mid 0.10$	$0.80 \mid 0.17$		$\rho = 0.9$
AIC	0.98 0.23	$0.98 \mid 0.20$	$0.98 \mid 0.17$	$0.93 \mid 0.49$		$\bar{s}_{Oracle} = 11.6$
BIC	0.97 0.22	0.98 0.20	0.98 0.16	0.31 0.13		SOracle - 11.0
CV.1se	0.03 0.01	0.02 0.01	0.01 0.00	0.93 0.35	0.27 0.02	
CV.min	0.41 0.10	0.20 0.04	0.10 0.02	0.96 0.43	0.55 0.10	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.53 0.11	0.24 0.06	0.98 0.20	0.90 0.25		$\rho = 0$
AIC	0.97 0.47	0.98 0.34	0.98 0.22	0.97 0.45		_ 7.0
BIC	0.97 0.46	0.98 0.34	0.98 0.21	0.97 0.45		$\bar{s}_{Oracle} = 7.9$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.94 0.20	0.31 0.01	
CV.min	0.42 0.06	0.26 0.03	0.13 0.01	0.98 0.27	0.60 0.06	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.57 0.07	0.07 0.01	0.98 0.15	0.93 0.15		$\rho = 0.5$
AIC	0.98 0.32	0.98 0.26	0.99 0.17	0.98 0.30		
BIC	0.98 0.31	0.98 0.25	0.99 0.17	0.98 0.30		$\bar{s}_{Oracle} = 7.6$
CV.1se	0.03 0.04	0.03 0.04	0.01 0.05	0.57 0.27	0.15 0.11	
CV.13C CV.min	0.51 0.25	0.40 0.21	0.01 0.03	'	0.48 0.24	$\int sd(u)/\sigma = 0.5$
			,	0.92 0.37 0.88 0.34	0.40 0.24	$\begin{array}{c c} \operatorname{sd}(\mu)/\sigma = 0.5 \\ \rho = 0.9 \end{array}$
AIC	0.63 0.28	0.10 0.13	0.66 0.24	'		$\rho = 0.9$
AIC	0.99 0.38	0.99 0.35	0.99 0.31	0.98 0.49		$\bar{s}_{Oracle} = 5.5$
BIC	0.99 0.38	0.99 0.35	0.99 0.31	0.62 0.33		

Table 112: FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 50.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.06 0.01	0.03 0.00	0.01 0.00	0.78 0.19	0.18 0.01	
CV.min	$0.47 \mid 0.08$	$0.20 \mid 0.01$	$0.09 \mid 0.00$	0.83 0.25	$0.51 \mid 0.07$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47 0.05	0.36 0.05	0.89 0.11	0.72 0.12		$\rho = 0$
AIC	0.86 0.29	0.88 0.21	0.90 0.13	0.84 0.26		<u></u>
BIC	0.86 0.29	0.88 0.20	0.90 0.12	0.84 0.26		$\bar{s}_{Oracle} = 57.2$
CV.1se	0.03 0.00	0.03 0.00	0.01 0.00	0.86 0.09	0.25 0.00	
CV.min	0.40 0.02	0.24 0.01	$0.09 \mid 0.00$	0.90 0.13	0.52 0.02	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.52 0.02	0.08 0.00	0.92 0.08	0.85 0.05		$\rho = 0.5$
AIC	0.91 0.18	0.92 0.15	0.93 0.10	0.91 0.16		- 57.0
BIC	0.91 0.18	0.92 0.15	0.93 0.10	0.91 0.16		$\bar{s}_{Oracle} = 57.0$
CV.1se	0.04 0.00	0.04 0.01	0.02 0.01	0.51 0.03	0.08 0.01	
CV.min	0.54 0.03	0.44 0.02	0.18 0.01	0.85 0.06	0.41 0.02	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.62 0.03	0.10 0.01	0.43 0.04	0.81 0.04		$\rho = 0.9$
AIC	0.93 0.14	0.93 0.12	0.93 0.10	0.91 0.15		- 550
BIC	0.93 0.14	0.93 0.12	0.93 0.09	0.50 0.05		$\bar{s}_{Oracle} = 55.0$
CV.1se	0.04 0.00	0.02 0.00	0.01 0.00	0.88 0.19	0.25 0.01	
CV.min	0.44 0.05	0.18 0.01	0.10 0.00	0.91 0.25	0.55 0.05	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.54 0.05	0.60 0.08	0.94 0.12	0.84 0.12	ı	$\rho = 0$
AIC	0.93 0.30	0.94 0.20	0.95 0.13	0.92 0.27		,
BIC	0.93 0.30	0.94 0.20	0.95 0.13	0.92 0.27		$\bar{s}_{Oracle} = 30.6$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.91 0.09	0.30 0.00	
CV.min	0.36 0.02	0.23 0.01	0.11 0.00	0.94 0.15	0.56 0.02	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.52 0.02	0.14 0.01	0.96 0.08	0.91 0.06	****	$\rho = 0.5$
AIC	0.95 0.20	0.95 0.15	0.96 0.10	0.95 0.17		,
BIC	0.95 0.19	0.95 0.15	0.96 0.10	0.95 0.17		$\bar{s}_{Oracle} = 30.4$
CV.1se	0.03 0.01	0.03 0.01	0.02 0.00	0.54 0.04	0.17 0.01	
CV.min	0.46 0.04	0.35 0.03	0.15 0.01	0.89 0.09	0.50 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.57 0.04	0.09 0.01	0.83 0.08	0.85 0.07	0.00 0.00	$\rho = 0.9$
AIC	0.96 0.16	0.96 0.14	0.96 0.11	0.95 0.20		,
BIC	0.96 0.16	0.96 0.14	0.96 0.11	0.66 0.10		$\bar{s}_{Oracle} = 27.7$
CV.1se	0.03 0.00	0.02 0.00	0.02 0.00	0.96 0.19	0.30 0.00	
CV.rise CV.min	0.43 0.04	0.17 0.00	0.10 0.00	0.98 0.24	0.60 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.59 0.03	0.93 0.12	0.98 0.11	0.95 0.11	0.00 0.03	$\rho = 0$
AIC	0.98 0.29	0.98 0.12	0.99 0.11	0.98 0.26		,
BIC	0.98 0.29	0.98 0.18	0.99 0.11	0.98 0.26		$\bar{s}_{Oracle} = 8.7$
CV.1se	0.02 0.00	0.01 0.00	0.01 0.00	0.95 0.12	0.32 0.00	
CV.13C	0.40 0.02	0.19 0.00	0.01 0.00	0.98 0.17	0.59 0.02	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.59 0.03	0.50 0.05	0.99 0.10	0.96 0.08	0.57 0.02	$\rho = 0.5$
AIC	0.98 0.23	0.99 0.16	0.99 0.11	0.98 0.20		,
BIC	0.98 0.23	0.99 0.16	0.99 0.11	0.98 0.20		$\bar{s}_{Oracle} = 8.5$
CV.1se	0.98 0.23	0.02 0.00	0.01 0.00	0.58 0.10	0.31 0.01	
CV.1sc CV.min	0.42 0.07	0.02 0.00	0.01 0.00	0.94 0.20	0.60 0.07	$sd(u)/\sigma = 0.5$
AICc	0.42 0.07	0.27 0.04	0.12 0.01	0.94 0.20	0.00 0.07	$\begin{vmatrix} \operatorname{sd}(\mu)/\sigma = 0.5 \\ \rho = 0.9 \end{vmatrix}$
AICC	0.37 0.08	0.07 0.01		$0.92 \mid 0.10$ $0.98 \mid 0.30$,
BIC	'	0.99 0.23	$0.99 \mid 0.20$			$\bar{s}_{Oracle} = 7.3$
DIC	0.99 0.28	0.99 0.23	0.99 0.20	0.84 0.21		

Table 113: FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 100.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.04 0.00	0.01 0.00	0.01 0.00	0.80 0.13	0.22 0.00	
CV.min	0.43 0.04	0.15 0.00	0.08 0.00	0.83 0.18	0.51 0.04	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.48 0.03	0.67 0.07	$0.88 \mid 0.09$	0.74 0.07		$\rho = 0$
AIC	0.85 0.23	0.87 0.15	$0.89 \mid 0.10$	0.84 0.20		_ 77.5
BIC	0.85 0.22	0.87 0.15	0.89 0.10	0.84 0.20		$\bar{s}_{Oracle} = 77.5$
CV.1se	0.02 0.00	0.01 0.00	0.01 0.00	0.86 0.07	0.26 0.00	
CV.min	0.39 0.01	0.20 0.00	0.09 0.00	0.89 0.11	0.54 0.01	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.51 0.01	0.17 0.01	0.91 0.07	0.85 0.04		$\rho = 0.5$
AIC	0.90 0.16	0.90 0.12	0.91 0.09	0.90 0.13		
BIC	0.90 0.15	0.90 0.12	0.91 0.09	0.89 0.13		$\bar{s}_{Oracle} = 77.5$
CV.1se	0.03 0.00	0.03 0.00	0.02 0.00	0.55 0.02	0.18 0.00	
CV.min	0.45 0.01	0.32 0.01	0.15 0.00	0.85 0.04	0.47 0.01	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.56 0.01	0.09 0.00	0.84 0.06	0.82 0.03	'	$\rho = 0.9$
AIC	0.91 0.13	0.92 0.11	0.92 0.09	0.90 0.12		76.0
BIC	0.91 0.13	0.92 0.11	0.92 0.09	0.67 0.06		$\bar{s}_{Oracle} = 76.0$
CV.1se	0.04 0.00	0.02 0.00	0.01 0.00	0.90 0.14	0.26 0.00	
CV.min	0.43 0.03	0.17 0.00	0.09 0.00	0.92 0.19	0.57 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.54 0.03	0.86 0.09	0.95 0.09	0.87 0.07		$\rho = 0$
AIC	0.93 0.24	0.94 0.15	0.95 0.10	0.93 0.21		,
BIC	0.93 0.23	0.94 0.15	0.95 0.10	0.92 0.21		$\bar{s}_{Oracle} = 37.7$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.92 0.08	0.32 0.00	
CV.min	0.39 0.01	0.21 0.00	0.10 0.00	0.94 0.12	0.57 0.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.53 0.01	0.38 0.03	0.96 0.07	0.92 0.04	0.07 0.00	$\rho = 0.5$
AIC	0.95 0.17	0.95 0.13	0.96 0.09	0.95 0.15		,
BIC	0.95 0.17	0.95 0.12	0.96 0.08	0.95 0.15		$\bar{s}_{Oracle} = 37.2$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.55 0.03	0.26 0.00	
CV.min	0.40 0.02	0.28 0.01	0.13 0.00	0.92 0.07	0.54 0.02	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.53 0.02	0.07 0.00	0.95 0.08	0.88 0.04	0.01 0.02	$\rho = 0.9$
AIC	0.96 0.15	0.96 0.12	0.96 0.10	0.95 0.16		,
BIC	0.96 0.15	0.96 0.12	0.96 0.10	0.74 0.09		$\bar{s}_{Oracle} = 34.6$
CV.1se	0.03 0.00	0.02 0.00	0.02 0.00	0.97 0.15	0.34 0.00	
CV.rise CV.min	0.45 0.03	0.16 0.00	0.10 0.00	0.98 0.20	0.63 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.59 0.03	0.98 0.10	0.99 0.10	0.96 0.08	0.02 0.02	$\rho = 0$
AIC	0.99 0.25	0.99 0.14	0.99 0.10	0.98 0.22		,
BIC	0.98 0.25	0.99 0.14	0.99 0.10	0.98 0.22		$\bar{s}_{Oracle} = 6.8$
CV.1se	0.03 0.00	0.01 0.00	0.01 0.00	0.95 0.10	0.34 0.00	
CV.13c	0.39 0.02	0.18 0.00	0.10 0.00	0.99 0.17	0.63 0.02	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.55 0.02	0.82 0.07	0.99 0.09	0.96 0.06	0.03 0.02	$\rho = 0.5$
AIC	0.99 0.02	0.02 0.07	0.99 0.10	0.99 0.20		
BIC	0.99 0.22	0.99 0.13	0.99 0.10	0.99 0.20		$\bar{s}_{Oracle} = 6.7$
CV.1se	0.99 0.22	0.99 0.14	0.01 0.00	0.57 0.07	0.31 0.00	
CV.1se CV.min	0.01 0.00	0.01 0.00	0.01 0.00	0.95 0.16	0.60 0.04	$sd(\mu)/\sigma = 0.5$
AICc	0.56 0.04	0.25 0.01	0.11 0.00	0.93 0.10	0.00 0.04	$\rho = 0.9$
AIC	0.99 0.04	0.00 0.00	0.99 0.13	0.94 0.11		·
BIC	0.99 0.24	0.99 0.20	0.99 0.16	0.99 0.20		$\bar{s}_{Oracle} = 6.4$
DIC	0.99 0.24	0.99 0.20	0.99 0.10	0.00 0.17		

Table 114: FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 200.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.82 0.10	0.25 0.00	
CV.min	0.43 0.03	0.14 0.00	$0.07 \mid 0.00$	$0.85 \mid 0.14$	0.57 0.03	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.51 0.02	0.83 0.07	$0.89 \mid 0.07$	$0.79 \mid 0.05$		$\rho = 0$
AIC	0.86 0.18	0.88 0.12	$0.89 \mid 0.08$	$0.85 \mid 0.16$		$\bar{s}_{Oracle} = 91.1$
BIC	$0.86 \mid 0.18$	0.88 0.12	$0.89 \mid 0.08$	$0.85 \mid 0.16$		$S_{Oracle} = 91.1$
CV.1se	0.02 0.00	0.02 0.00	0.00 0.00	0.86 0.06	0.27 0.00	
CV.min	0.40 0.01	0.18 0.00	0.09 0.00	0.88 0.10	0.54 0.01	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.51 0.01	0.44 0.03	0.90 0.06	0.85 0.03		$\rho = 0.5$
AIC	0.89 0.14	0.89 0.11	0.90 0.08	0.89 0.12		- 01.1
BIC	0.89 0.14	0.90 0.10	0.90 0.08	0.89 0.12		$\bar{s}_{Oracle} = 91.1$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.55 0.01	0.24 0.00	
CV.min	0.42 0.01	0.27 0.00	0.13 0.00	0.86 0.04	0.55 0.01	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.52 0.01	0.07 0.00	0.90 0.07	0.83 0.02	'	$\rho = 0.9$
AIC	0.90 0.13	0.90 0.10	0.90 0.08	0.90 0.11		- 00.5
BIC	0.90 0.12	0.90 0.10	0.90 0.08	0.75 0.06		$\bar{s}_{Oracle} = 90.5$
CV.1se	0.04 0.00	0.02 0.00	0.02 0.00	0.92 0.11	0.30 0.00	
CV.min	0.42 0.02	0.15 0.00	0.11 0.00	0.93 0.16	0.58 0.02	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58 0.02	0.94 0.08	0.95 0.08	0.90 0.06	ı	$\rho = 0$
AIC	0.94 0.20	0.94 0.12	0.95 0.08	0.93 0.18		,
BIC	0.94 0.20	0.95 0.12	0.95 0.08	0.93 0.18		$\bar{s}_{Oracle} = 41.2$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.92 0.06	0.32 0.00	
CV.min	0.41 0.01	0.19 0.00	0.10 0.00	0.94 0.11	0.62 0.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.54 0.01	0.71 0.05	0.95 0.07	0.92 0.04	1	$\rho = 0.5$
AIC	0.95 0.16	0.95 0.11	0.95 0.08	0.95 0.13		
BIC	0.95 0.16	0.95 0.11	0.95 0.08	0.95 0.13		$\bar{s}_{Oracle} = 41.3$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.55 0.02	0.29 0.00	
CV.min	0.39 0.01	0.25 0.01	0.10 0.00	0.92 0.06	0.57 0.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.54 0.02	0.06 0.00	0.95 0.08	0.89 0.04	0.07 0.01	$\rho = 0.9$
AIC	0.95 0.15	0.95 0.12	0.96 0.10	0.95 0.15		,
BIC	0.95 0.15	0.95 0.12	0.96 0.10	0.80 0.09		$\bar{s}_{Oracle} = 39.9$
CV.1se	0.02 0.00	0.02 0.00	0.02 0.00	0.98 0.12	0.33 0.00	
CV.min	0.43 0.01	0.14 0.00	0.10 0.00	0.99 0.17	0.64 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.58 0.02	0.99 0.09	0.99 0.08	0.97 0.06	0.0.1 0.02	$\rho = 0$
AIC	0.99 0.21	0.99 0.13	0.99 0.08	0.99 0.18		,
BIC	0.99 0.20	0.99 0.12	0.99 0.08	0.99 0.18		$\bar{s}_{Oracle} = 5.4$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.95 0.09	0.33 0.00	
CV.min	0.41 0.02	0.16 0.00	0.10 0.00	0.99 0.15	0.63 0.01	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.57 0.01	0.97 0.07	0.99 0.08	0.96 0.05	0.05 0.01	$\rho = 0.5$
AIC	0.99 0.21	0.99 0.12	0.99 0.09	0.99 0.18		
BIC	0.99 0.21	0.99 0.12	0.99 0.08	0.99 0.18		$\bar{s}_{Oracle} = 5.5$
CV.1se	0.01 0.00	0.01 0.00	0.01 0.00	0.57 0.04	0.33 0.00	
CV.13C	0.40 0.02	0.23 0.01	0.11 0.00	0.97 0.12	0.61 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.57 0.03	0.23 0.01	0.99 0.13	0.94 0.08	0.01 0.03	$\rho = 0.9$
AIC	0.97 0.03	0.99 0.18	0.99 0.15	0.94 0.08		
BIC	0.99 0.23	0.99 0.18	0.99 0.15	0.86 0.14		$\bar{s}_{Oracle} = 5.3$
DIC	0.33 0.43	0.22 0.18	0.99 0.13	0.00 0.14		

Table 115: FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL}\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	0.44 0.66	0.28 0.65	0.05 0.44	0.72 0.81	0.17 0.65	
CV.min	$0.80 \mid 0.88$	$0.65 \mid 0.86$	0.21 0.67	$0.85 \mid 0.87$	$0.46 \mid 0.82$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.64 0.80	0.47 0.81	$0.80 \mid 0.88$	$0.69 \mid 0.79$		$\rho = 0$
AIC	0.91 0.93	0.90 0.92	$0.88 \mid 0.88$	$0.89 \mid 0.88$		ā - · - 10 0
BIC	0.91 0.92	$0.90 \mid 0.92$	$0.88 \mid 0.88$	$0.82 \mid 0.85$		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.42 0.55	0.27 0.56	0.05 0.36	0.76 0.78	0.17 0.60	
CV.min	0.80 0.83	0.66 0.82	0.20 0.60	0.86 0.84	0.44 0.80	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.64 0.74	0.50 0.77	0.81 0.86	0.71 0.74		$\rho = 0.5$
AIC	0.92 0.92	0.91 0.92	0.88 0.87	0.90 0.86		= 10.0
BIC	0.91 0.91	0.90 0.91	0.88 0.87	0.85 0.84		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.42 0.51	0.30 0.52	0.05 0.33	0.77 0.75	0.19 0.57	
CV.min	0.80 0.80	0.68 0.78	0.22 0.55	0.87 0.82	0.47 0.75	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.66 0.69	$0.52 \mid 0.72$	0.81 0.82	0.72 0.70	,	$\rho = 0.9$
AIC	0.92 0.89	0.91 0.89	0.89 0.83	0.90 0.84		_ 10.0
BIC	0.92 0.89	0.91 0.89	0.89 0.83	0.85 0.81		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.12 0.10	0.08 0.07	0.02 0.03	0.84 0.56	0.13 0.10	
CV.min	0.64 0.40	0.39 0.25	0.13 0.10	0.91 0.62	0.54 0.36	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.59 0.35	0.44 0.29	0.92 0.39	0.78 0.48	1	$\rho = 0$
AIC	0.94 0.66	0.94 0.58	0.94 0.42	0.93 0.64		,
BIC	0.94 0.66	0.94 0.58	0.94 0.42	0.93 0.63		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.07	0.07 0.05	0.03 0.03	0.86 0.51	0.13 0.07	
CV.min	0.62 0.34	0.40 0.22	0.11 0.09	0.92 0.58	0.51 0.30	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.60 0.30	0.43 0.25	0.93 0.38	0.79 0.42	0.00	$\rho = 0.5$
AIC	0.94 0.63	0.94 0.56	0.95 0.40	0.94 0.60		,
BIC	0.94 0.63	0.94 0.55	0.95 0.40	0.93 0.59		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.11 0.07	0.07 0.05	0.02 0.03	0.86 0.48	0.14 0.08	
CV.min	0.62 0.32	0.41 0.21	0.13 0.09	0.92 0.56	0.51 0.28	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.60 0.28	0.43 0.23	0.93 0.36	0.81 0.40	0.01 0.20	$\rho = 0.9$
AIC	0.94 0.61	0.94 0.55	0.95 0.38	0.94 0.58		,
BIC	0.94 0.61	0.94 0.54	0.95 0.38	0.93 0.58		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.04 0.00	0.02 0.00	0.01 0.00	0.94 0.26	0.26 0.01	
CV.min	0.42 0.07	0.24 0.02	0.11 0.01	0.96 0.32	0.56 0.07	$sd(\mu)/\sigma = 0.5$
AICc	0.56 0.07	0.73 0.13	0.97 0.15	0.90 0.17	0.00 0.07	$\rho = 0$
AIC	0.97 0.36	0.97 0.27	0.98 0.17	0.96 0.34		
BIC	0.97 0.36	0.97 0.27	0.98 0.17	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.93 0.23	0.32 0.01	
CV.13C	0.44 0.06	0.02 0.00	0.01 0.00	0.96 0.29	0.59 0.06	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.55 0.06	0.70 0.11	0.97 0.14	0.91 0.15	0.57 0.00	$\rho = 0.5$
AIC	0.97 0.34	0.70 0.11	0.98 0.14	0.97 0.13		
BIC	0.97 0.34	0.97 0.25	0.98 0.16	0.97 0.31		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.01	0.02 0.00	0.01 0.00	0.94 0.21	0.30 0.01	
CV.1se CV.min	0.03 0.01	0.02 0.00	0.01 0.00	0.94 0.21	0.60 0.06	$sd(\mu)/\sigma = 0.5$
AICc	0.56 0.06	0.23 0.02	0.12 0.01	0.90 0.27	0.00 0.00	$\rho = 0.9$
AIC	0.30 0.00	0.03 0.10	0.97 0.14	0.92 0.14		
BIC		0.97 0.23		0.97 0.30		$\bar{s}_{Oracle} = 10.0$
DIC	0.97 0.32	0.97 0.24	0.98 0.16	0.97 0.29		

Table 116: FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.43 0.69	0.24 0.63	0.05 0.24	0.74 0.92	0.31 0.73	
CV.min	$0.79 \mid 0.94$	0.61 0.91	$0.18 \mid 0.53$	$0.85 \mid 0.95$	$0.65 \mid 0.93$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.63 \mid 0.88$	$0.47 \mid 0.92$	0.81 0.90	$0.68 \mid 0.88$		$\rho = 0$
AIC	0.91 0.98	0.90 0.98	0.87 0.91	$0.89 \mid 0.96$		= -10.0
BIC	0.91 0.98	0.90 0.98	0.87 0.91	0.87 0.95		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.37 0.52	0.22 0.48	0.04 0.19	0.77 0.88	0.29 0.61	
CV.min	0.78 0.89	0.60 0.84	0.16 0.42	0.86 0.93	0.62 0.87	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.79	0.52 0.89	0.82 0.88	0.71 0.83	,	$\rho = 0.5$
AIC	0.91 0.97	0.90 0.97	0.88 0.89	0.89 0.94		,
BIC	0.91 0.97	0.90 0.97	0.88 0.89	0.88 0.94		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.37 0.47	0.24 0.43	0.04 0.14	0.78 0.85	0.31 0.55	
CV.min	0.78 0.86	0.60 0.77	0.17 0.36	0.87 0.91	0.63 0.82	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.64 0.75	0.55 0.84	0.82 0.83	0.72 0.79		$\rho = 0.9$
AIC	0.91 0.96	0.90 0.95	0.89 0.84	0.90 0.92		,
BIC	0.91 0.95	0.90 0.95	0.88 0.84	0.89 0.91		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.07	0.04 0.03	0.01 0.01	0.85 0.59	0.16 0.07	
CV.min	0.60 0.38	0.30 0.17	0.11 0.06	0.91 0.67	0.55 0.35	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.32	0.61 0.36	0.93 0.37	0.78 0.49	0.55 0.55	$\rho = 0$
AIC	0.94 0.70	0.94 0.57	0.95 0.39	0.93 0.68		'
BIC	0.94 0.70	0.94 0.57	0.95 0.38	0.93 0.68		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.08 0.04	0.04 0.03	0.01 0.01	0.86 0.55	0.16 0.05	
CV.1sc CV.min	0.56 0.30	0.04 0.03	0.01 0.01	0.92 0.62	0.54 0.28	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.27	0.60 0.31	0.10 0.03	0.79 0.43	0.54 0.20	$\rho = 0.5$
AIC	0.94 0.67	0.00 0.51	0.95 0.35	0.93 0.64		$\rho = 0.5$
BIC	0.94 0.67	0.94 0.53	0.95 0.35	0.93 0.64		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.08 0.04	0.04 0.02	0.93 0.33	0.93 0.04	0.19 0.06	
CV.1se CV.min		0.04 0.02	0.02 0.01	0.87 0.51	0.19 0.00	$\operatorname{sd}(\mu)/\sigma = 1$
	0.56 0.28	!		,	0.30 0.20	$\begin{array}{c c} \operatorname{sd}(\mu)/\delta = 1\\ \rho = 0.9 \end{array}$
AIC	0.57 0.25	0.59 0.28	0.94 0.33	$0.81 \mid 0.41$		$\rho = 0.9$
AIC	0.94 0.65	0.94 0.53	0.95 0.35	$0.93 \mid 0.62$		$\bar{s}_{Oracle} = 10.0$
BIC	0.94 0.65	0.94 0.53	0.95 0.35	0.93 0.61	0.20 0.01	
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.93 0.26	0.29 0.01	-1()/- 0.5
CV.min	0.44 0.06	0.20 0.01	0.10 0.01	0.96 0.32	0.56 0.06	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.54 0.06	0.92 0.17	0.97 0.14	0.91 0.16		$\rho = 0$
AIC	0.97 0.37	0.97 0.25	0.98 0.15	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.36	0.97 0.25	0.98 0.15	0.96 0.34	0.22 0.01	
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.94 0.23	0.32 0.01	1/)/
CV.min	0.43 0.05	0.19 0.01	0.10 0.01	0.96 0.30	0.59 0.05	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.55 0.05	0.89 0.15	0.98 0.13	0.91 0.15		$\rho = 0.5$
AIC	0.97 0.34	0.97 0.23	0.98 0.15	0.97 0.32		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.34	0.97 0.23	0.98 0.14	0.97 0.32		ooracie 10.0
CV.1se	0.03 0.00	0.03 0.00	0.01 0.00	0.94 0.21	0.30 0.01	
CV.min	0.46 0.06	0.21 0.01	0.10 0.01	0.96 0.28	0.61 0.05	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	$0.58 \mid 0.05$	0.90 0.14	0.98 0.13	0.92 0.14		$\rho = 0.9$
AIC	0.97 0.33	0.98 0.23	0.98 0.15	$0.97 \mid 0.30$		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.33	0.98 0.22	0.98 0.15	0.97 0.30		Oracie - 10.0

Table 117: FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.43 0.68	0.23 0.62	0.05 0.23	0.74 0.92	0.32 0.72	
CV.min	0.79 0.94	0.60 0.90	0.16 0.49	0.85 0.96	0.65 0.92	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.88	0.47 0.93	0.82 0.90	0.69 0.89		$\rho = 0$
AIC	0.91 0.98	0.90 0.98	0.87 0.90	0.89 0.96		= 10.0
BIC	0.91 0.98	0.89 0.98	0.87 0.90	0.87 0.96		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.37 0.51	0.21 0.47	0.04 0.16	0.77 0.89	0.29 0.61	
CV.min	0.77 0.88	0.59 0.83	0.15 0.40	0.86 0.94	0.64 0.87	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.79	0.51 0.90	0.82 0.87	0.71 0.83	'	$\rho = 0.5$
AIC	0.91 0.97	0.90 0.97	0.88 0.88	0.89 0.94		·
BIC	0.91 0.97	0.90 0.97	0.88 0.88	0.88 0.94		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.37 0.46	0.22 0.41	0.04 0.14	0.78 0.86	0.30 0.54	
CV.min	0.78 0.86	0.59 0.76	0.16 0.34	0.87 0.91	0.64 0.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.64 0.75	0.55 0.85	0.83 0.82	0.72 0.80	010 1 0100	$\rho = 0.9$
AIC	0.91 0.96	0.90 0.95	0.89 0.83	0.90 0.92		· ·
BIC	0.91 0.95	0.90 0.95	0.88 0.83	0.88 0.92		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.06	0.04 0.03	0.01 0.01	0.85 0.60	0.17 0.07	
CV.min	0.59 0.38	0.29 0.15	0.11 0.05	0.91 0.67	0.56 0.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.55 0.32	0.65 0.38	0.93 0.37	0.78 0.49	0.50 0.51	$\rho = 0$
AIC	0.94 0.71	0.94 0.57	0.95 0.38	0.93 0.69		′
BIC	0.94 0.71	0.94 0.57	0.95 0.38	0.93 0.68		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.07 0.04	0.04 0.03	0.01 0.01	0.86 0.55	0.18 0.05	
CV.1sc CV.min	0.56 0.30	0.04 0.03	0.01 0.01	0.80 0.53	0.18 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.27	0.62 0.33	0.10 0.03	0.72 0.03	0.55 0.26	$\rho = 0.5$
AIC	0.94 0.67	0.02 0.53	0.95 0.36	0.93 0.64		$\rho = 0.5$
BIC	0.94 0.67	0.94 0.54	0.95 0.36	0.93 0.64		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.08 0.04	0.04 0.02	0.93 0.30	0.93 0.04	0.17 0.05	
CV.1se CV.min	0.56 0.04	0.04 0.02	0.02 0.01	0.87 0.32	0.17 0.03	$\operatorname{sd}(\mu)/\sigma = 1$
	,	,		'	0.33 0.20	$\beta \operatorname{sd}(\mu)/\delta = 1$ $\rho = 0.9$
AICc	0.57 0.24	0.61 0.30	0.94 0.33	0.81 0.41		$\rho = 0.9$
AIC	0.94 0.65	0.94 0.52	0.95 0.35	0.93 0.62		$\bar{s}_{Oracle} = 10.0$
BIC	0.94 0.65	0.94 0.52	0.95 0.34	0.93 0.61	0.20 0.01	
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.93 0.26	0.30 0.01	-1()/- 0.5
CV.min	0.44 0.06	0.21 0.01	0.10 0.01	0.96 0.32	0.57 0.06	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.54 0.06	0.93 0.17	0.97 0.14	0.91 0.16		$\rho = 0$
AIC	0.97 0.37	0.97 0.24	0.98 0.15	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.36	0.97 0.24	0.98 0.15	0.96 0.34	0.20 0.01	
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.94 0.23	0.30 0.01	1/)/
CV.min	0.43 0.05	0.18 0.01	0.10 0.01	0.96 0.30	0.59 0.05	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.56 0.05	0.92 0.15	0.98 0.13	0.91 0.15		$\rho = 0.5$
AIC	0.97 0.34	0.97 0.24	0.98 0.15	0.97 0.32		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.34	0.97 0.23	0.98 0.14	0.97 0.32		ooracie 1010
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.94 0.21	0.31 0.01	
CV.min	0.46 0.05	0.20 0.01	0.10 0.01	0.96 0.28	$0.61 \mid 0.05$	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.57 0.05	0.91 0.14	0.98 0.13	0.92 0.14		$\rho = 0.9$
AIC	0.97 0.33	0.98 0.22	0.98 0.14	$0.97 \mid 0.30$		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.33	0.98 0.22	0.98 0.14	0.97 0.30		Oracie - 10.0

Table 118: FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.43 0.69	0.23 0.61	0.05 0.23	0.74 0.92	0.32 0.72	
CV.min	0.79 0.94	0.59 0.90	0.17 0.50	0.85 0.96	0.65 0.92	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.88	0.47 0.93	0.82 0.89	0.69 0.89		$\rho = 0$
AIC	0.91 0.98	0.90 0.98	0.87 0.90	0.89 0.96		= 10.0
BIC	0.91 0.98	0.89 0.98	0.87 0.90	0.87 0.96		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.36 0.52	0.20 0.46	0.03 0.16	0.77 0.89	0.29 0.61	
CV.min	0.77 0.89	0.58 0.82	0.15 0.40	0.86 0.94	0.64 0.88	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.80	0.51 0.91	0.82 0.88	0.71 0.84	'	$\rho = 0.5$
AIC	0.91 0.97	0.90 0.97	0.88 0.88	0.89 0.94		·
BIC	0.91 0.97	0.90 0.97	0.87 0.88	0.88 0.94		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.38 0.47	0.22 0.42	0.04 0.14	0.78 0.86	0.30 0.55	
CV.min	0.78 0.86	0.59 0.76	0.16 0.34	0.87 0.91	0.64 0.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.64 0.74	0.55 0.85	0.83 0.82	0.72 0.80	ı	$\rho = 0.9$
AIC	0.91 0.96	0.90 0.95	0.89 0.83	0.90 0.92		· ·
BIC	0.91 0.95	0.90 0.95	0.88 0.83	0.89 0.92		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.07	0.04 0.03	0.02 0.01	0.85 0.59	0.17 0.07	
CV.min	0.59 0.38	0.28 0.15	0.11 0.06	0.91 0.67	0.55 0.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.55 0.32	0.67 0.38	0.93 0.37	0.78 0.49	3.00	$\rho = 0$
AIC	0.94 0.71	0.94 0.57	0.95 0.38	0.93 0.68		,
BIC	0.94 0.70	0.94 0.57	0.95 0.38	0.93 0.68		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.08 0.04	0.04 0.03	0.02 0.01	0.87 0.54	0.17 0.05	
CV.13C	0.55 0.30	0.27 0.12	0.10 0.04	0.92 0.62	0.53 0.28	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.26	0.64 0.33	0.94 0.34	0.79 0.43	0.55 0.20	$\rho = 0.5$
AIC	0.94 0.67	0.94 0.54	0.95 0.35	0.93 0.64		$\rho = 0.9$
BIC	0.94 0.67	0.94 0.54	0.95 0.35	0.93 0.64		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.08 0.04	0.04 0.02	0.02 0.01	0.87 0.52	0.19 0.05	
CV.13C CV.min	0.56 0.28	0.04 0.02	0.02 0.01	0.92 0.60	0.56 0.25	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.24	0.28 0.11	0.10 0.04	0.92 0.00	0.30 0.23	$\rho = 0.9$
AIC	0.94 0.65	0.04 0.50	0.94 0.35	0.93 0.62		$\rho = 0.9$
BIC	0.94 0.65	0.94 0.52	0.95 0.33	0.93 0.02		$\bar{s}_{Oracle} = 10.0$
CV.1se					0.28 0.01	
	0.03 0.00 0.43 0.06	$0.02 \mid 0.00$	0.02 0.00 0.10 0.01	0.94 0.26	0.28 0.01	$\frac{1}{2}$ ad(u)/ $\sigma = 0.5$
CV.min		0.20 0.01		0.96 0.32	0.38 0.00	$sd(\mu)/\sigma = 0.5$
AICc	0.54 0.06	0.94 0.17	0.97 0.14	0.91 0.16		$\rho = 0$
AIC	0.97 0.37	0.97 0.24	0.98 0.15	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.36	0.97 0.23	0.98 0.15	0.96 0.34	0.21 0.01	
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.94 0.23	0.31 0.01	1/)/ 0.5
CV.min	0.43 0.05	0.18 0.01	0.10 0.01	0.96 0.30	0.58 0.05	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.56 0.05	0.92 0.15	0.98 0.13	0.91 0.15		$\rho = 0.5$
AIC	0.97 0.34	0.97 0.23	0.98 0.15	0.97 0.32		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.34	0.97 0.23	0.98 0.14	0.97 0.32	0.21 0.01	
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.94 0.21	0.31 0.01	1/)/
CV.min	0.46 0.05	0.21 0.01	0.10 0.01	0.96 0.28	0.61 0.06	$sd(\mu)/\sigma = 0.5$
AICc	0.58 0.05	0.92 0.15	0.98 0.12	0.92 0.14		$\rho = 0.9$
AIC	0.97 0.33	0.98 0.22	0.98 0.14	0.97 0.30		$\bar{s}_{Oracle} = 10.0$
BIC	0.97 0.33	0.98 0.22	0.98 0.14	0.97 0.30		- Oracle 20.0

Table 119: FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 10.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.42 0.64	0.26 0.63	0.05 0.42	0.72 0.81	0.16 0.64	
CV.min	$0.78 \mid 0.87$	$0.64 \mid 0.85$	$0.18 \mid 0.64$	$0.85 \mid 0.87$	0.44 0.81	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.79	0.34 0.73	$0.65 \mid 0.81$	$0.69 \mid 0.79$		$\rho = 0$
AIC	0.91 0.92	0.90 0.92	$0.88 \mid 0.88$	$0.89 \mid 0.88$		ā - · - 10 0
BIC	0.91 0.92	$0.90 \mid 0.92$	$0.88 \mid 0.88$	$0.81 \mid 0.85$		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.11 0.07	0.11 0.09	0.03 0.08	0.85 0.34	0.10 0.16	
CV.min	0.69 0.26	0.57 0.24	0.16 0.16	0.93 0.44	0.39 0.29	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.66 0.24	0.22 0.15	0.61 0.35	0.84 0.29		$\rho = 0.5$
AIC	0.95 0.57	0.94 0.57	0.94 0.48	0.94 0.48		= 10.0
BIC	0.95 0.57	0.94 0.56	0.94 0.48	0.83 0.42		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.12 0.10	0.09 0.10	0.04 0.11	0.64 0.24	0.04 0.12	
CV.min	0.71 0.15	0.61 0.14	0.23 0.13	0.86 0.42	0.32 0.15	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.72 0.14	0.21 0.11	0.02 0.10	0.82 0.31	'	$\rho = 0.9$
AIC	0.97 0.28	0.97 0.26	0.97 0.23	0.90 0.56		
BIC	0.93 0.27	0.95 0.26	0.97 0.23	0.34 0.13		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.11 0.10	0.07 0.07	0.02 0.04	0.84 0.55	0.11 0.09	
CV.min	0.61 0.38	0.39 0.25	0.12 0.10	0.91 0.61	0.51 0.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.60 0.36	0.14 0.14	0.92 0.41	0.77 0.47	ı	$\rho = 0$
AIC	0.94 0.66	0.94 0.57	0.94 0.42	0.93 0.63		,
BIC	0.94 0.65	0.94 0.57	0.94 0.42	0.92 0.63		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.05 0.02	0.05 0.02	0.02 0.02	0.89 0.24	0.15 0.04	
CV.min	0.54 0.12	0.40 0.09	0.15 0.05	0.95 0.31	0.46 0.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.63 0.13	0.13 0.05	0.91 0.22	0.88 0.19		$\rho = 0.5$
AIC	0.96 0.39	0.97 0.34	0.97 0.26	0.96 0.35		,
BIC	0.96 0.38	0.97 0.34	0.97 0.25	0.94 0.34		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.07 0.06	0.07 0.07	0.03 0.08	0.51 0.12	0.04 0.08	
CV.min	0.66 0.12	0.56 0.11	0.20 0.10	0.89 0.20	0.28 0.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.68 0.12	0.16 0.10	0.03 0.09	0.84 0.14	0.20 0.11	$\rho = 0.9$
AIC	0.98 0.24	0.98 0.22	0.98 0.18	0.95 0.41		,
BIC	0.97 0.24	0.98 0.22	0.98 0.18	0.38 0.12		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.04 0.01	0.02 0.00	0.01 0.00	0.93 0.25	0.27 0.01	
CV.min	0.43 0.07	0.24 0.03	0.12 0.01	0.96 0.31	0.58 0.07	$sd(\mu)/\sigma = 0.5$
AICc	0.54 0.08	0.19 0.03	0.97 0.15	0.90 0.17		$\rho = 0$
AIC	0.97 0.36	0.97 0.27	0.98 0.17	0.96 0.33		,
BIC	0.97 0.35	0.97 0.26	0.98 0.17	0.96 0.33		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.00	0.03 0.00	0.01 0.00	0.93 0.13	0.29 0.01	
CV.min	0.43 0.03	0.29 0.02	0.14 0.01	0.97 0.18	0.60 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.57 0.04	0.08 0.01	0.98 0.11	0.93 0.09	0.00 0.02	$\rho = 0.5$
AIC	0.98 0.23	0.98 0.19	0.98 0.11	0.98 0.21		
BIC	0.98 0.23	0.98 0.18	0.98 0.13	0.98 0.21		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.01	0.03 0.01	0.01 0.01	0.58 0.07	0.18 0.02	
CV.rise CV.min	0.48 0.06	0.39 0.05	0.16 0.03	0.93 0.13	0.51 0.06	$sd(\mu)/\sigma = 0.5$
AICc	0.46 0.00	0.37 0.03	0.69 0.09	0.89 0.10	0.51 0.00	$\rho = 0.9$
AIC	0.98 0.21	0.10 0.03	0.09 0.09	0.89 0.10		
BIC	0.98 0.21	0.98 0.18	0.98 0.14	0.67 0.23		$\bar{s}_{Oracle} = 10.0$
DIC	0.70 0.21	0.30 0.18	0.20 0.14	0.07 0.13		

Table 120: FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 50.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.41 0.65	0.23 0.61	0.05 0.26	0.73 0.91	0.28 0.71	
CV.min	0.78 0.93	0.59 0.90	0.17 0.56	0.84 0.94	0.61 0.91	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.87	0.33 0.83	$0.76 \mid 0.89$	$0.68 \mid 0.88$		$\rho = 0$
AIC	0.91 0.97	0.90 0.97	0.87 0.90	$0.89 \mid 0.95$		= -100
BIC	0.91 0.97	0.90 0.97	0.87 0.90	0.86 0.94		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.07 0.04	0.06 0.04	0.02 0.03	0.86 0.39	0.15 0.07	
CV.min	0.60 0.23	0.44 0.17	0.15 0.08	0.93 0.49	0.49 0.22	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.22	0.14 0.09	0.91 0.36	0.83 0.32		$\rho = 0.5$
AIC	0.95 0.60	0.94 0.56	0.95 0.40	0.94 0.53		_ 10.0
BIC	0.95 0.60	0.94 0.55	0.95 0.40	0.93 0.52		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.26 0.10	0.23 0.11	0.13 0.12	0.69 0.19	0.12 0.14	
CV.min	0.78 0.20	0.73 0.17	0.33 0.15	0.90 0.26	0.34 0.18	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.77 0.19	0.32 0.14	0.18 0.14	0.84 0.21	'	$\rho = 0.9$
AIC	0.97 0.32	0.97 0.29	0.97 0.23	0.95 0.43		,
BIC	0.97 0.32	0.97 0.29	0.97 0.23	0.61 0.19		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.07	0.05 0.04	0.01 0.02	0.84 0.58	0.15 0.07	
CV.min	0.58 0.37	0.29 0.17	0.11 0.06	0.91 0.66	0.54 0.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.57 0.33	0.16 0.12	0.93 0.38	0.77 0.49	0.0 1 0.0 1	$\rho = 0$
AIC	0.94 0.69	0.94 0.57	0.95 0.39	0.93 0.67		,
BIC	0.94 0.69	0.94 0.57	0.94 0.39	0.92 0.67		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.04 0.01	0.03 0.01	0.02 0.01	0.91 0.26	0.19 0.02	
CV.min	0.48 0.10	0.32 0.06	0.13 0.02	0.95 0.34	0.55 0.09	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.57 0.10	0.12 0.03	0.96 0.19	0.88 0.20	0.00	$\rho = 0.5$
AIC	0.96 0.40	0.97 0.34	0.97 0.22	0.96 0.37		,
BIC	0.96 0.40	0.97 0.34	0.97 0.22	0.96 0.37		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.09 0.03	0.09 0.03	0.05 0.03	0.68 0.13	0.17 0.05	
CV.rise CV.min	0.60 0.12	0.54 0.10	0.24 0.07	0.92 0.20	0.50 0.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.68 0.12	0.16 0.05	0.46 0.10	0.88 0.16	0.50 0.11	$\rho = 0.9$
AIC	0.98 0.28	0.10 0.03	0.48 0.19	0.96 0.32		$\rho = 0.5$
BIC	0.97 0.28	0.98 0.24	0.97 0.19	0.68 0.17		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.01	0.02 0.00	0.02 0.00	0.93 0.25	0.25 0.01	
CV.1sc CV.min	0.03 0.01	0.02 0.00	0.02 0.00	0.96 0.32	0.55 0.06	$sd(\mu)/\sigma = 0.5$
AICc	0.55 0.07	0.21 0.02	0.11 0.01	0.90 0.17	0.55 0.00	$\rho = 0$
AIC	0.97 0.36	0.97 0.09	0.97 0.14	0.96 0.34		,
BIC	0.97 0.36	0.97 0.25	0.98 0.16	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.02 0.00	0.02 0.00	0.98 0.13	0.93 0.13	0.28 0.01	
	'	0.02 0.00		0.93 0.13	'	$ad(u)/\sigma = 0.5$
CV.min AICc	0.44 0.03		0.13 0.00	0.97 0.19	0.59 0.03	$\begin{array}{c c} \operatorname{sd}(\mu)/\sigma = 0.5\\ \rho = 0.5 \end{array}$
	0.56 0.03	0.12 0.01 0.98 0.18	0.98 0.10 0.98 0.12	,		$\rho = 0.5$
AIC	0.98 0.24	0.98 0.18		0.98 0.21		$\bar{s}_{Oracle} = 10.0$
BIC	0.98 0.23		0.98 0.12	0.98 0.21	0.20 0.01	
CV.1se	$0.03 \mid 0.00$	$0.02 \mid 0.00$	$0.02 \mid 0.00$	0.62 0.05	0.30 0.01	ad()/= 0.5
CV.min	0.45 0.03	0.33 0.02	$0.15 \mid 0.01$	0.94 0.11	0.61 0.03	$sd(\mu)/\sigma = 0.5$
AIC	0.60 0.04	$0.08 \mid 0.00$	0.95 0.11	$0.91 \mid 0.08$		$\rho = 0.9$
AIC	0.98 0.21	0.98 0.17	0.98 0.13	0.98 0.20		$\bar{s}_{Oracle} = 10.0$
BIC	0.98 0.21	0.98 0.17	0.98 0.13	0.84 0.13		

Table 121: FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.41 0.66	0.22 0.61	0.04 0.25	0.73 0.91	0.29 0.72	
CV.min	0.78 0.94	$0.58 \mid 0.89$	$0.17 \mid 0.52$	$0.84 \mid 0.94$	0.62 0.91	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.87	0.33 0.84	$0.78 \mid 0.89$	$0.69 \mid 0.89$		$\rho = 0$
AIC	0.91 0.97	$0.90 \mid 0.97$	$0.87 \mid 0.90$	$0.89 \mid 0.95$		$\bar{s}_{Oracle} = 10.0$
BIC	0.91 0.97	$0.90 \mid 0.97$	$0.87 \mid 0.90$	$0.86 \mid 0.95$		SOracle - 10.0
CV.1se	0.07 0.04	0.06 0.04	0.02 0.02	0.86 0.39	0.16 0.06	
CV.min	0.59 0.23	0.43 0.17	$0.14 \mid 0.07$	0.93 0.50	0.50 0.22	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.62 \mid 0.22$	0.14 0.09	0.91 0.36	$0.83 \mid 0.33$		$\rho = 0.5$
AIC	0.95 0.60	0.94 0.55	0.95 0.39	$0.94 \mid 0.54$		$\bar{s}_{Oracle} = 10.0$
BIC	$0.95 \mid 0.60$	0.94 0.55	0.95 0.39	0.93 0.52		$s_{Oracle} = 10.0$
CV.1se	0.27 0.10	0.24 0.11	0.13 0.11	0.69 0.19	0.14 0.14	
CV.min	0.79 0.20	0.73 0.17	0.33 0.15	0.89 0.26	0.37 0.18	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.77 0.20	0.33 0.14	0.20 0.15	0.84 0.22	•	$\rho = 0.9$
AIC	0.97 0.32	0.97 0.29	0.97 0.23	0.95 0.42		_ 10.0
BIC	0.97 0.32	0.97 0.29	0.97 0.23	0.64 0.20		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.07	0.04 0.04	0.02 0.02	0.84 0.59	0.14 0.07	
CV.min	0.58 0.37	0.28 0.16	0.10 0.06	0.91 0.66	0.54 0.34	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.57 0.33	0.18 0.12	0.93 0.37	0.77 0.49	ı	$\rho = 0$
AIC	0.94 0.70	0.94 0.56	0.95 0.39	0.93 0.67		,
BIC	0.94 0.69	0.94 0.56	0.94 0.39	0.93 0.67		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.04 0.01	0.03 0.01	0.02 0.01	0.91 0.26	0.25 0.02	
CV.min	0.47 0.09	0.30 0.05	0.13 0.02	0.95 0.34	0.56 0.09	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.57 0.10	0.11 0.02	0.96 0.19	0.88 0.20	0.00	$\rho = 0.5$
AIC	0.96 0.40	0.97 0.34	0.97 0.21	0.96 0.37		,
BIC	0.96 0.40	0.97 0.33	0.97 0.21	0.96 0.37		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.09 0.02	0.10 0.02	0.05 0.03	0.70 0.13	0.22 0.05	
CV.rise CV.min	0.59 0.11	0.53 0.09	0.25 0.06	0.92 0.20	0.54 0.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.68 0.12	0.17 0.04	0.56 0.12	0.88 0.16	0.51 0.11	$\rho = 0.9$
AIC	0.97 0.28	0.98 0.24	0.98 0.12	0.96 0.31		$\rho = 0.3$
BIC	0.97 0.28	0.98 0.24	0.98 0.19	0.69 0.18		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.01	0.02 0.00	0.02 0.00	0.93 0.25	0.26 0.01	
CV.13C CV.min	0.42 0.06	0.02 0.00	0.10 0.01	0.96 0.32	0.57 0.06	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.56 0.07	0.56 0.10	0.97 0.14	0.90 0.17	0.57 0.00	$\rho = 0$
AIC	0.97 0.36	0.97 0.25	0.98 0.14	0.96 0.34		$\rho = 0$
BIC	0.97 0.36	0.97 0.23	0.98 0.15	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.93 0.12	0.30 0.00	
CV.1se CV.min	'	0.02 0.00	0.01 0.00		0.61 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.43 0.03 0.56 0.03	0.25 0.01		$0.97 \mid 0.18$	0.01 0.03	$\rho = 0.5$
		,	$0.98 \mid 0.10$	$0.93 \mid 0.08$		$\rho = 0.5$
AIC	$0.98 \mid 0.23$	0.98 0.18	0.98 0.12	$0.98 \mid 0.21$		$\bar{s}_{Oracle} = 10.0$
BIC	0.98 0.23	0.98 0.18	0.98 0.11	0.98 0.21	0.20 0.01	
CV.1se	$0.02 \mid 0.00$	$0.02 \mid 0.00$	0.02 0.00	0.62 0.05	0.28 0.01	ad()/= 0.5
CV.min	0.45 0.03	0.33 0.02	$0.14 \mid 0.01$	0.94 0.11	0.59 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.60 0.03	$0.07 \mid 0.00$	0.97 0.11	$0.91 \mid 0.07$		$\rho = 0.9$
AIC	0.98 0.21	0.98 0.17	0.98 0.13	0.98 0.20		$\bar{s}_{Oracle} = 10.0$
BIC	0.98 0.21	0.98 0.17	0.98 0.13	0.83 0.13		

Table 122: FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.41 0.65	0.21 0.61	0.04 0.25	0.73 0.91	0.29 0.72	
CV.min	0.79 0.94	0.58 0.90	0.16 0.54	$0.84 \mid 0.95$	0.61 0.91	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.87	0.32 0.84	$0.79 \mid 0.90$	$0.69 \mid 0.89$		$\rho = 0$
AIC	0.91 0.98	$0.90 \mid 0.97$	$0.87 \mid 0.91$	$0.89 \mid 0.95$		ā - 100
BIC	0.91 0.97	$0.89 \mid 0.97$	$0.87 \mid 0.91$	$0.86 \mid 0.95$		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.07 0.04	0.06 0.04	0.02 0.03	0.86 0.39	0.16 0.06	
CV.min	0.59 0.23	0.42 0.16	0.14 0.07	0.93 0.50	0.49 0.21	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.62 0.22	0.14 0.09	0.91 0.35	0.83 0.33		$\rho = 0.5$
AIC	0.95 0.60	0.94 0.55	0.95 0.38	0.94 0.54		= 10.0
BIC	0.95 0.60	0.94 0.54	0.95 0.38	0.92 0.52		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.28 0.10	0.24 0.11	0.13 0.11	0.69 0.20	0.14 0.14	
CV.min	0.79 0.20	0.72 0.17	0.33 0.15	0.89 0.26	0.37 0.18	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.77 0.20	0.34 0.14	0.23 0.15	0.84 0.22	'	$\rho = 0.9$
AIC	0.97 0.32	0.97 0.29	0.97 0.23	0.95 0.41		
BIC	0.97 0.32	0.97 0.29	0.97 0.23	0.64 0.21		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.10 0.07	0.04 0.04	0.01 0.02	0.84 0.59	0.15 0.07	
CV.min	0.58 0.38	0.28 0.16	0.11 0.06	0.91 0.66	0.53 0.35	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.33	0.19 0.13	0.93 0.37	0.77 0.49	ı	$\rho = 0$
AIC	0.94 0.70	0.94 0.56	0.95 0.39	0.93 0.67		,
BIC	0.94 0.70	0.94 0.56	0.94 0.38	0.92 0.67		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.04 0.01	0.03 0.01	0.02 0.01	0.90 0.26	0.23 0.02	
CV.min	0.48 0.10	0.30 0.05	0.13 0.02	0.95 0.34	0.56 0.09	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58 0.10	0.10 0.02	0.96 0.19	0.88 0.20	0.00	$\rho = 0.5$
AIC	0.96 0.41	0.97 0.34	0.97 0.21	0.96 0.37		,
BIC	0.96 0.40	0.97 0.33	0.97 0.21	0.96 0.37		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.09 0.02	0.09 0.02	0.05 0.03	0.70 0.13	0.22 0.05	
CV.min	0.59 0.11	0.53 0.10	0.25 0.06	0.92 0.20	0.53 0.11	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.68 0.12	0.17 0.04	0.58 0.12	0.88 0.17	0.00	$\rho = 0.9$
AIC	0.97 0.28	0.98 0.24	0.98 0.20	0.96 0.31		,
BIC	0.97 0.28	0.98 0.24	0.97 0.20	0.72 0.18		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.01	0.02 0.00	0.01 0.00	0.93 0.25	0.25 0.01	
CV.min	0.42 0.06	0.20 0.02	0.10 0.01	0.96 0.32	0.56 0.06	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.55 0.07	0.58 0.11	0.97 0.14	0.90 0.17	0.00	$\rho = 0$
AIC	0.97 0.36	0.97 0.24	0.98 0.15	0.96 0.34		,
BIC	0.97 0.36	0.97 0.24	0.98 0.15	0.96 0.34		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.02 0.00	0.02 0.00	0.01 0.00	0.93 0.12	0.30 0.00	
CV.min	0.43 0.03	0.25 0.01	0.13 0.00	0.97 0.18	0.62 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.56 0.03	0.16 0.01	0.98 0.10	0.93 0.08	0.02 0.03	$\rho = 0.5$
AIC	0.98 0.23	0.98 0.18	0.98 0.11	0.98 0.21		
BIC	0.98 0.23	0.98 0.17	0.98 0.11	0.98 0.21		$\bar{s}_{Oracle} = 10.0$
CV.1se	0.03 0.00	0.02 0.00	0.01 0.00	0.61 0.05	0.28 0.01	
CV.1se CV.min	0.05 0.00	0.02 0.00	0.01 0.00	0.01 0.03	0.60 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.43 0.03	0.08 0.00	0.13 0.01	0.93 0.10	0.00 0.03	$\rho = 0.9$
AICC	0.00 0.03	0.08 0.00	0.97 0.11	0.91 0.07		
	0.98 0.20	0.98 0.17	0.98 0.13	0.98 0.20		$\bar{s}_{Oracle} = 10.0$
BIC	0.90 0.20	0.90 0.17	0.90 0.12	0.63 0.12		

Table 123: FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 10.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.36 0.74	0.20 0.71	0.01 0.60	0.23 0.65	0.01 0.57	
CV.min	$0.72 \mid 0.85$	0.64 0.82	$0.22 \mid 0.73$	0.54 0.72	0.20 0.71	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.70 \mid 0.84$	0.63 0.82	0.36 0.76	0.52 0.72		$\rho = 0$
AIC	0.95 0.95	0.95 0.95	0.95 0.94	0.53 0.72		<u></u>
BIC	0.22 0.71	0.14 0.69	$0.01 \mid 0.61$	0.17 0.63		$\bar{s}_{Oracle} = 33.3$
CV.1se	0.41 0.74	0.25 0.71	0.02 0.60	0.28 0.65	0.01 0.57	
CV.min	0.74 0.84	0.66 0.82	0.25 0.72	0.56 0.72	0.21 0.71	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.72 0.84	0.65 0.82	0.39 0.77	0.54 0.71		$\rho = 0.5$
AIC	0.95 0.96	0.95 0.95	0.95 0.94	0.55 0.71		- 22.2
BIC	0.24 0.70	0.15 0.68	0.01 0.60	0.20 0.62		$\bar{s}_{Oracle} = 33.3$
CV.1se	0.45 0.74	0.28 0.71	0.03 0.60	0.30 0.64	0.01 0.58	
CV.min	0.75 0.84	0.68 0.82	0.28 0.72	0.57 0.71	0.23 0.71	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.73 0.83	0.66 0.81	0.40 0.76	0.55 0.70	'	$\rho = 0.9$
AIC	0.95 0.96	0.95 0.96	0.95 0.94	0.56 0.71		
BIC	0.27 0.69	0.17 0.68	0.02 0.60	0.22 0.61		$\bar{s}_{Oracle} = 33.1$
CV.1se	0.27 0.64	0.13 0.59	0.01 0.47	0.45 0.67	0.01 0.46	
CV.min	0.72 0.79	0.61 0.76	0.14 0.61	0.81 0.81	0.26 0.65	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.72 0.79	0.63 0.77	0.34 0.67	$0.77 \mid 0.79$	'	$\rho = 0$
AIC	0.97 0.95	0.97 0.95	0.97 0.93	0.85 0.83		,
BIC	0.19 0.61	0.10 0.58	0.00 0.45	0.16 0.57		$\bar{s}_{Oracle} = 26.3$
CV.1se	0.31 0.62	0.16 0.58	0.01 0.47	0.50 0.67	0.01 0.46	
CV.min	0.74 0.78	0.64 0.74	0.15 0.60	0.82 0.80	0.24 0.62	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.73 0.78	0.65 0.75	0.37 0.67	0.78 0.77		$\rho = 0.5$
AIC	0.97 0.95	0.97 0.95	0.96 0.93	0.86 0.82		,
BIC	0.21 0.59	0.12 0.56	0.01 0.45	0.19 0.56		$\bar{s}_{Oracle} = 26.4$
CV.1se	0.35 0.63	0.19 0.58	0.02 0.47	0.51 0.66	0.01 0.46	
CV.min	0.75 0.79	0.66 0.75	0.18 0.60	0.81 0.79	0.27 0.63	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.74 0.79	0.67 0.76	0.39 0.68	0.79 0.77	0.27 0.00	$\rho = 0.9$
AIC	0.97 0.95	0.97 0.95	0.96 0.93	0.85 0.82		,
BIC	0.23 0.59	0.13 0.56	0.01 0.45	0.21 0.56		$\bar{s}_{Oracle} = 26.1$
CV.1se	0.12 0.38	0.06 0.34	0.01 0.26	0.62 0.62	0.01 0.27	
CV.min	0.70 0.66	0.54 0.59	0.14 0.43	0.88 0.79	0.38 0.53	$sd(\mu)/\sigma = 0.5$
AICc	0.73 0.69	0.60 0.63	0.22 0.43	0.85 0.76	0.00 0.00	$\rho = 0$
AIC	0.98 0.94	0.98 0.94	0.98 0.91	0.94 0.88		,
BIC	0.13 0.40	0.06 0.36	0.00 0.18	0.17 0.44		$\bar{s}_{Oracle} = 19.7$
CV.1se	0.14 0.36	0.08 0.33	0.01 0.26	0.66 0.62	0.01 0.26	
CV.min	0.72 0.66	0.59 0.59	0.14 0.42	0.89 0.79	0.36 0.51	$sd(\mu)/\sigma = 0.5$
AICc	0.75 0.68	0.64 0.63	0.26 0.45	0.85 0.75	0.50 0.51	$\rho = 0.5$
AIC	0.98 0.95	0.98 0.94	0.98 0.92	0.95 0.88		
BIC	0.13 0.37	0.07 0.34	0.00 0.18	0.19 0.41		$\bar{s}_{Oracle} = 19.4$
CV.1se	0.16 0.36	0.09 0.32	0.02 0.24	0.65 0.60	0.02 0.26	
CV.min	0.74 0.65	0.61 0.58	0.16 0.40	$0.89 \mid 0.77$	0.37 0.50	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.74 0.03	0.66 0.62	0.10 0.40	0.86 0.73	0.57 0.50	$\rho = 0.9$
AIC	0.76 0.06	0.00 0.02	0.28 0.44	0.86 0.75		,
BIC	0.98 0.93	0.98 0.94	0.98 0.92	0.21 0.40		$\bar{s}_{Oracle} = 19.7$
Біс	0.14 0.33	0.07 0.32	0.00 0.17	0.21 0.40		

Table 124: FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.49 0.76	0.36 0.71	0.07 0.56	0.43 0.66	0.15 0.61	
CV.min	0.64 0.83	0.56 0.80	0.19 0.65	0.57 0.74	0.39 0.74	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.55 0.79	0.48 0.77	0.43 0.75	0.53 0.71		$\rho = 0$
AIC	0.84 0.94	0.84 0.94	0.84 0.91	0.63 0.77		124.2
BIC	0.22 0.59	0.13 0.56	0.02 0.47	0.22 0.54		$\bar{s}_{Oracle} = 124.2$
CV.1se	0.52 0.76	0.39 0.71	0.08 0.56	0.47 0.66	0.13 0.60	
CV.min	0.66 0.84	0.58 0.80	0.21 0.65	0.59 0.73	0.38 0.73	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.57 0.78	0.50 0.77	0.44 0.76	0.55 0.71	,	$\rho = 0.5$
AIC	0.84 0.94	0.84 0.94	0.84 0.92	0.65 0.77		,
BIC	0.23 0.57	0.15 0.55	0.02 0.47	0.25 0.53		$\bar{s}_{Oracle} = 123.8$
CV.1se	0.54 0.76	0.41 0.71	0.10 0.56	0.48 0.65	0.16 0.60	
CV.min	0.67 0.84	0.59 0.80	0.24 0.65	0.60 0.73	0.39 0.73	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 0.78	0.51 0.77	0.45 0.75	0.56 0.70		$\rho = 0.9$
AIC	0.84 0.94	0.84 0.94	0.84 0.91	0.65 0.76		,
BIC	0.25 0.56	0.16 0.55	0.03 0.47	0.27 0.52		$\bar{s}_{Oracle} = 123.6$
CV.1se	0.43 0.58	0.27 0.50	0.07 0.34	0.52 0.62	0.26 0.50	
CV.min	0.66 0.73	0.54 0.66	0.20 0.46	0.68 0.73	0.57 0.68	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.60 0.69	0.55 0.67	0.62 0.69	0.62 0.69	0.07 0.00	$\rho = 0$
AIC	0.90 0.94	0.90 0.92	0.90 0.90	0.79 0.82		
BIC	0.08 0.24	0.06 0.29	0.01 0.12	0.17 0.38		$\bar{s}_{Oracle} = 90.2$
CV.1se	0.46 0.57	0.31 0.49	0.08 0.34	0.55 0.61	0.23 0.46	
CV.nin	0.67 0.73	0.56 0.66	0.21 0.46	0.69 0.72	0.55 0.66	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.61 0.68	0.56 0.66	0.62 0.69	0.64 0.68	0.55 0.00	$\rho = 0.5$
AIC	0.90 0.94	0.90 0.93	0.90 0.90	0.80 0.82		,
BIC	0.06 0.17	0.07 0.26	0.01 0.12	0.18 0.35		$\bar{s}_{Oracle} = 90.2$
CV.1se	0.48 0.57	0.34 0.50	0.10 0.33	0.56 0.61	0.26 0.47	
CV.rise CV.min	0.48 0.37	0.58 0.67	0.24 0.46	0.69 0.71	0.56 0.66	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.62 0.69	0.57 0.67	0.63 0.69	0.65 0.68	0.50 0.00	$\rho = 0.9$
AIC	0.90 0.94	0.90 0.93	0.90 0.90	0.80 0.81		$\rho = 0.3$
BIC	0.06 0.16	0.08 0.24	0.01 0.10	0.20 0.34		$\bar{s}_{Oracle} = 89.2$
CV.1se	0.08 0.06	0.03 0.24	0.01 0.10	0.65 0.44	0.09 0.04	
CV.1sc CV.min	0.61 0.41	0.03 0.02	0.00 0.01	0.80 0.64	0.59 0.40	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.64 0.43	0.63 0.43	0.07 0.03	0.76 0.57	0.57 0.40	$\rho = 0$
AIC	0.94 0.92	0.94 0.90	0.23 0.10	0.90 0.81		,
BIC	0.01 0.01	0.00 0.01	0.00 0.00	0.06 0.04		$\bar{s}_{Oracle} = 56.2$
CV.1se	0.07 0.04	0.03 0.02	0.00 0.00	0.67 0.42	0.08 0.03	
					0.08 0.03	$ad(u)/\sigma = 0.5$
CV.min	0.60 0.36	0.34 0.19	0.08 0.04 0.29 0.20	$0.81 \mid 0.61$	0.57 0.55	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.64 0.39	0.63 0.41		0.77 0.55		$\rho = 0.5$
AIC	0.94 0.92	0.94 0.91	0.94 0.90	0.90 0.81		$\bar{s}_{Oracle} = 56.2$
BIC	0.01 0.01	0.01 0.01	0.00 0.00	0.06 0.03	0.07 0.02	
CV.1se	0.07 0.03	0.03 0.01	$0.00 \mid 0.00$	0.67 0.41	0.07 0.03	1/)/ 0.5
CV.min	0.61 0.36	0.37 0.18	$0.09 \mid 0.04$	0.81 0.60	0.58 0.34	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.66 0.40	0.64 0.41	0.27 0.19	0.77 0.54		$\rho = 0.9$
AIC	0.94 0.92	0.94 0.91	0.94 0.90	0.90 0.80		$\bar{s}_{Oracle} = 56.5$
BIC	0.01 0.01	0.01 0.01	0.00 0.00	0.07 0.03		

Table 125: FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\;\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	$0.47 \mid 0.74$	$0.36 \mid 0.68$	0.15 0.52	$0.41 \mid 0.64$	0.38 0.70	
CV.min	$0.58 \mid 0.82$	$0.50 \mid 0.78$	0.26 0.62	$0.51 \mid 0.71$	$0.54 \mid 0.80$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.46 0.73	$0.41 \mid 0.71$	$0.41 \mid 0.71$	$0.45 \mid 0.67$		$\rho = 0$
AIC	0.75 0.93	$0.75 \mid 0.92$	$0.75 \mid 0.89$	$0.57 \mid 0.76$		$\bar{s}_{Oracle} = 208.7$
BIC	0.06 0.20	0.09 0.38	0.08 0.43	0.18 0.42		Oracle - 200.7
CV.1se	$0.49 \mid 0.74$	$0.39 \mid 0.68$	0.16 0.52	$0.44 \mid 0.63$	0.36 0.68	
CV.min	$0.59 \mid 0.82$	$0.52 \mid 0.78$	0.27 0.62	$0.52 \mid 0.71$	$0.52 \mid 0.79$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.48 \mid 0.72$	$0.42 \mid 0.71$	$0.40 \mid 0.71$	$0.47 \mid 0.66$		$\rho = 0.5$
AIC	$0.75 \mid 0.93$	$0.75 \mid 0.93$	$0.75 \mid 0.90$	$0.58 \mid 0.76$		$\bar{s}_{Oracle} = 208.8$
BIC	0.03 0.10	0.10 0.35	0.09 0.43	0.20 0.39		Stracle - 200.0
CV.1se	0.50 0.74	$0.40 \mid 0.68$	0.18 0.52	0.44 0.62	0.38 0.68	
CV.min	0.60 0.82	$0.52 \mid 0.78$	0.29 0.62	$0.53 \mid 0.70$	$0.53 \mid 0.79$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.48 0.72	0.43 0.71	0.41 0.70	$0.47 \mid 0.65$		$\rho = 0.9$
AIC	0.75 0.93	0.75 0.93	0.75 0.90	$0.59 \mid 0.75$		$\bar{s}_{Oracle} = 209.4$
BIC	0.03 0.08	0.11 0.33	0.11 0.43	0.21 0.38		SOracle - 209.4
CV.1se	0.41 0.47	0.25 0.33	0.06 0.10	0.51 0.56	0.40 0.47	
CV.min	0.60 0.67	0.47 0.54	0.18 0.24	0.62 0.67	0.60 0.67	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.53 0.59	0.51 0.58	0.61 0.61	0.56 0.61		$\rho = 0$
AIC	0.84 0.92	0.84 0.91	0.85 0.89	0.74 0.80		142.2
BIC	0.00 0.01	0.01 0.02	0.00 0.00	0.05 0.09		$\bar{s}_{Oracle} = 143.3$
CV.1se	0.42 0.45	0.27 0.32	0.06 0.09	0.53 0.54	0.41 0.44	
CV.min	0.62 0.66	0.49 0.54	0.17 0.22	0.63 0.66	0.61 0.66	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.54 0.57	0.52 0.57	0.61 0.61	0.58 0.60	·	$\rho = 0.5$
AIC	0.84 0.93	0.84 0.91	0.85 0.89	0.75 0.79		_ 144.0
BIC	0.00 0.01	0.01 0.01	0.00 0.00	0.05 0.06		$\bar{s}_{Oracle} = 144.0$
CV.1se	0.44 0.45	0.30 0.32	0.06 0.07	0.54 0.53	0.42 0.43	
CV.min	0.62 0.66	0.51 0.54	0.19 0.22	0.63 0.65	0.62 0.66	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.55 0.56	0.53 0.57	0.61 0.61	0.59 0.59	'	$\rho = 0.9$
AIC	0.84 0.93	0.84 0.91	0.85 0.89	0.75 0.79		
BIC	0.00 0.00	0.00 0.01	0.00 0.00	0.05 0.06		$\bar{s}_{Oracle} = 143.6$
CV.1se	0.04 0.01	0.01 0.00	0.00 0.00	0.67 0.33	0.14 0.01	
CV.min	0.54 0.23	0.20 0.05	0.06 0.01	0.79 0.53	0.54 0.23	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.60 0.27	0.64 0.33	0.15 0.09	0.75 0.44	·	$\rho = 0$
AIC	0.92 0.91	0.92 0.89	0.92 0.90	0.88 0.76		′
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.05 0.01		$\bar{s}_{Oracle} = 77.9$
CV.1se	0.03 0.01	0.00 0.00	0.00 0.00	0.68 0.31	0.15 0.01	
CV.min	0.51 0.18	0.19 0.04	0.06 0.01	0.80 0.51	0.51 0.17	$sd(\mu)/\sigma = 0.5$
AICc	0.59 0.23	0.61 0.30	0.17 0.10	0.76 0.43		$\rho = 0.5$
AIC	0.92 0.92	0.92 0.90	0.92 0.90	0.89 0.77		
BIC	0.00 0.00	0.00 0.00	0.00 0.00	0.06 0.01		$\bar{s}_{Oracle} = 78.0$
CV.1se	0.02 0.01	0.01 0.00	0.00 0.00	0.69 0.29	0.14 0.01	
CV.rise CV.min	0.50 0.17	0.19 0.04	0.07 0.01	0.80 0.49	0.52 0.17	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.60 0.23	0.62 0.29	0.16 0.09	0.76 0.41	0.02 0.17	$\rho = 0.9$
AIC	0.92 0.91	0.92 0.89	0.92 0.90	0.89 0.76		
BIC	0.01 0.00	0.00 0.00	$0.02 \mid 0.00$	0.07 0.01		$\bar{s}_{Oracle} = 77.5$
DIC	0.01 0.00	0.00 0.00	0.00 0.00	0.07 0.01		

Table 126: FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 200.

	las	so	$GL \gamma$	$\gamma = 1$	GL γ	= 10	margii	nal AL	sparsenet MCP	
CV.1se	0.44	0.72	0.35	0.62	0.22	0.39	0.39	0.62	0.46 0.75	
CV.min	0.53	0.82	0.46	0.75	0.33	0.55	0.46	0.70	0.55 0.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.39	0.65	0.37	0.64	0.42	0.66	0.39	0.62		$\rho = 0$
AIC	0.67	0.93	0.67	0.92	0.67	0.88	0.52	0.77		202.1
BIC	0.00	0.00	0.00	0.01	0.13	0.23	0.03	0.04		$\bar{s}_{Oracle} = 293.1$
CV.1se	0.45	0.71	0.37	0.61	0.22	0.38	0.41	0.60	0.46 0.74	
CV.min	0.54	0.82	0.47	0.75	0.33	0.54	0.47	0.69	0.55 0.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.40	0.63	0.38	0.64	0.42	0.66	0.41	0.61	·	$\rho = 0.5$
AIC	0.67	0.93	0.67	0.92	0.67	0.89	0.53	0.76		- 202.7
BIC	0.00	0.00	0.00	0.00	0.11	0.19	0.02	0.03		$\bar{s}_{Oracle} = 293.7$
CV.1se	0.46	0.72	0.38	<u> </u>	0.23	0.36		0.59	0.47 0.74	
CV.min	0.54			0.75	0.34			0.68	0.56 0.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.40			0.63	0.42			0.59		$\rho = 0.9$
AIC	0.67			0.92	0.67	0.89		0.76		, , , , , , , , , , , , , , , , , , ,
BIC	0.00			0.00	0.11	0.17		0.02		$\bar{s}_{Oracle} = 293.3$
CV.1se	0.35			0.08	0.00	0.00		0.44	0.36 0.29	
CV.min	0.54			0.28	0.05	0.02		0.57	0.55 0.55	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.46			0.45	0.60	0.51		0.48	0.55 0.55	$\rho = 0$
AIC	0.77			0.89	0.78	0.88		0.75		,
BIC				0.00	0.00	0.00	0.02			$\bar{s}_{Oracle} = 217.0$
CV.1se	0.33			0.05	0.00	0.00		0.43	0.34 0.24	
CV.13C CV.min	0.55			0.03	0.04	0.00		0.56	$0.54 \mid 0.24$ $0.55 \mid 0.52$	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.47			0.44	0.60	0.52		0.30	0.55 0.52	$\rho = 0.5$
AIC	0.47			0.44	0.78	0.32		0.47		, , , , , , , , , , , , , , , , , , ,
BIC				0.00	0.00	0.00	0.02			$\bar{s}_{Oracle} = 214.8$
CV.1se	0.34			0.05	0.00	0.00		0.01	0.35 0.23	
CV.1se CV.min	0.54			0.03	0.00	0.00		0.42	0.55 0.52	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.33			0.24	0.60	0.51		0.35	0.33 0.32	$\rho = 0.9$
AICC	0.46			0.43	0.00	0.88		0.74		,
BIC		0.00		0.00	0.78	0.00	0.09			$\bar{s}_{Oracle} = 215.0$
									0.22 0.01	
CV.1se CV.min	0.03	0.00	0.00	0.00	0.00	0.00		0.24	0.22 0.01	$\operatorname{sd}(\mu)/\sigma = 0.5$
					0.07			0.43	0.34 0.12	
AICc				0.27	0.07	0.04		0.35		$\rho = 0$
AIC	0.91			0.89	0.91	0.91	0.88			$\bar{s}_{Oracle} = 90.7$
BIC	0.01	0.00		0.00	0.02	0.02		0.00	0.24 0.00	
CV.1se	0.02			0.00		0.00	0.73		0.24 0.00	1/)/ 0.5
CV.min	0.47		0.15		0.07		0.81		0.52 0.09	$sd(\mu)/\sigma = 0.5$
AICc	0.59			0.24	0.07	0.04		0.33		$\rho = 0.5$
AIC	0.91			0.89	0.91	0.91	0.88			$\bar{s}_{Oracle} = 91.4$
BIC	0.01			0.00	0.01	0.01		0.00	0.24 0.00	0.4000
CV.1se	0.01			0.00	0.00	0.00	0.72		0.24 0.00	1/)/
CV.min	0.47		0.16		0.06	0.00		0.40	0.51 0.08	$sd(\mu)/\sigma = 0.5$
AICc	0.58			0.24	0.07	0.04		0.32		$\rho = 0.9$
AIC	0.91			0.89	0.91	0.90	0.88			$\bar{s}_{Oracle} = 89.5$
BIC	0.01	0.00	0.00	0.00	0.01	0.01	0.09	0.00		-01466 57.5

Table 127: FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 10.

	lasso	$GL \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.36 0.74	0.21 0.71	0.02 0.60	0.24 0.65	0.00 0.57	
CV.min	$0.72 \mid 0.85$	0.64 0.83	$0.22 \mid 0.72$	0.55 0.73	0.20 0.71	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.70 \mid 0.84$	0.60 0.82	0.10 0.67	0.52 0.72		$\rho = 0$
AIC	0.95 0.95	0.95 0.95	0.95 0.94	0.53 0.72		<u></u>
BIC	0.22 0.70	0.12 0.68	0.00 0.57	0.18 0.63		$\bar{s}_{Oracle} = 33.2$
CV.1se	0.72 0.70	0.61 0.66	0.17 0.56	0.51 0.51	0.04 0.55	
CV.min	0.85 0.81	$0.81 \mid 0.77$	$0.53 \mid 0.67$	$0.60 \mid 0.55$	0.25 0.63	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.82 0.78	0.78 0.75	0.44 0.65	0.60 0.55		$\rho = 0.5$
AIC	0.94 0.95	0.94 0.95	0.94 0.94	0.60 0.55		_ 22.0
BIC	0.49 0.59	0.36 0.57	0.05 0.49	0.49 0.51		$\bar{s}_{Oracle} = 32.9$
CV.1se	0.87 0.65	0.85 0.60	0.73 0.50	0.04 0.37	0.48 0.50	
CV.min	0.90 0.76	0.89 0.73	0.81 0.60	0.06 0.39	0.66 0.57	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.89 0.72	0.87 0.68	$0.78 \mid 0.57$	0.06 0.39	,	$\rho = 0.9$
AIC	0.90 0.79	0.90 0.79	0.88 0.77	0.06 0.39		- 20.4
BIC	0.80 0.43	0.78 0.40	0.49 0.31	0.06 0.39		$\bar{s}_{Oracle} = 30.4$
CV.1se	0.27 0.64	0.13 0.59	0.01 0.48	0.47 0.68	0.01 0.47	
CV.min	0.72 0.79	0.61 0.76	0.15 0.61	0.81 0.81	0.26 0.65	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.72 0.79	0.57 0.75	0.03 0.52	$0.77 \mid 0.79$	1	$\rho = 0$
AIC	0.97 0.95	0.97 0.95	0.97 0.93	0.85 0.83		,
BIC	0.19 0.61	0.07 0.57	0.00 0.40	0.16 0.58		$\bar{s}_{Oracle} = 26.2$
CV.1se	0.66 0.55	0.53 0.51	0.12 0.42	0.76 0.57	0.07 0.44	
CV.min	0.85 0.72	0.81 0.68	0.43 0.54	0.86 0.67	0.33 0.55	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.84 0.70	0.79 0.66	0.31 0.51	0.85 0.65		$\rho = 0.5$
AIC	0.96 0.96	0.96 0.95	0.96 0.94	0.87 0.67		,
BIC	0.41 0.44	0.29 0.41	0.02 0.32	0.51 0.43		$\bar{s}_{Oracle} = 25.8$
CV.1se	0.68 0.31	0.80 0.34	0.77 0.33	0.32 0.44	0.61 0.35	
CV.min	0.90 0.59	0.90 0.56	0.84 0.45	0.53 0.54	0.76 0.45	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.91 0.56	0.89 0.51	0.77 0.39	0.53 0.54	0.70 0.10	$\rho = 0.9$
AIC	0.95 0.86	0.95 0.88	0.94 0.88	0.53 0.54		,
BIC	0.08 0.05	0.01 0.04	0.01 0.05	0.34 0.45		$\bar{s}_{Oracle} = 23.3$
CV.1se	0.12 0.38	0.06 0.34	0.01 0.26	0.63 0.64	0.01 0.27	
CV.nin	0.70 0.67	0.55 0.60	0.14 0.43	0.89 0.81	0.37 0.54	$sd(\mu)/\sigma = 0.5$
AICc	0.73 0.69	0.43 0.57	0.01 0.22	0.85 0.77	0.07 0.0 .	$\rho = 0$
AIC	0.98 0.95	0.98 0.94	0.98 0.91	0.94 0.88		,
BIC	0.13 0.41	0.03 0.33	0.00 0.09	0.17 0.44		$\bar{s}_{Oracle} = 19.2$
CV.1se	0.16 0.11	0.19 0.15	0.07 0.14	0.80 0.42	0.10 0.22	
CV.min	0.81 0.46	0.78 0.44	0.35 0.30	0.92 0.61	0.44 0.37	$sd(\mu)/\sigma = 0.5$
AICc	0.84 0.50	0.71 0.41	0.04 0.13	0.90 0.57	0.11 0.57	$\rho = 0.5$
AIC	0.98 0.95	0.98 0.95	0.98 0.93	0.94 0.74		·
BIC	0.10 0.11	0.04 0.09	0.00 0.05	0.17 0.12		$\bar{s}_{Oracle} = 19.0$
CV.1se	0.00 0.07	0.00 0.07	0.00 0.07	0.45 0.28	0.01 0.07	
CV.rise CV.min	0.57 0.09	0.45 0.08	0.16 0.07	0.82 0.64	0.35 0.12	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.70 0.10	0.43 0.08	0.10 0.07	0.82 0.04	0.55 0.12	$\rho = 0.9$
AIC	0.76 0.16	0.20 0.07	0.00 0.07	0.81 0.04		,
BIC	0.90 0.80	0.97 0.90	$0.97 \mid 0.88$ $0.00 \mid 0.07$	0.83 0.08		$\bar{s}_{Oracle} = 16.4$
Біс	0.09 0.07	0.01 0.07	0.00 0.07	0.13 0.12		

Table 128: FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.50 0.76	0.36 0.71	0.07 0.56	0.44 0.67	0.15 0.62	
CV.min	$0.65 \mid 0.84$	$0.56 \mid 0.81$	$0.19 \mid 0.65$	$0.58 \mid 0.74$	0.39 0.74	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.55 0.79	$0.47 \mid 0.77$	$0.29 \mid 0.70$	$0.53 \mid 0.72$		$\rho = 0$
AIC	$0.84 \mid 0.94$	$0.84 \mid 0.94$	$0.84 \mid 0.91$	$0.63 \mid 0.77$		$\bar{s}_{Oracle} = 122.8$
BIC	0.21 0.59	$0.11 \mid 0.55$	0.01 0.43	$0.22 \mid 0.55$		SOracle - 122.6
CV.1se	0.68 0.74	0.62 0.70	0.33 0.56	0.65 0.58	0.24 0.55	
CV.min	$0.74 \mid 0.84$	$0.70 \mid 0.80$	$0.47 \mid 0.66$	$0.69 \mid 0.65$	$0.42 \mid 0.64$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.68 \mid 0.74$	0.63 0.72	$0.48 \mid 0.68$	$0.67 \mid 0.62$		$\rho = 0.5$
AIC	$0.84 \mid 0.95$	0.84 0.94	$0.83 \mid 0.93$	$0.70 \mid 0.67$		_ 122.5
BIC	0.25 0.23	0.35 0.39	$0.15 \mid 0.41$	0.46 0.35		$\bar{s}_{Oracle} = 122.5$
CV.1se	0.74 0.74	0.71 0.70	0.60 0.58	0.56 0.17	0.54 0.54	
CV.min	0.77 0.83	0.75 0.80	0.64 0.67	0.61 0.21	0.59 0.61	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.73 0.72	0.71 0.70	0.62 0.65	0.61 0.20		$\rho = 0.9$
AIC	0.77 0.83	0.77 0.84	0.74 0.84	0.61 0.21		110.5
BIC	0.05 0.01	0.01 0.01	0.00 0.01	0.47 0.14		$\bar{s}_{Oracle} = 119.5$
CV.1se	0.43 0.58	0.27 0.50	0.07 0.33	0.52 0.62	0.26 0.49	
CV.min	0.66 0.73	0.54 0.66	0.19 0.45	0.68 0.73	0.57 0.68	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.60 0.69	0.50 0.65	0.32 0.51	0.62 0.69	'	$\rho = 0$
AIC	0.90 0.93	0.90 0.92	0.90 0.90	0.79 0.82		,
BIC	0.07 0.24	0.03 0.23	0.00 0.01	0.17 0.38		$\bar{s}_{Oracle} = 90.2$
CV.1se	0.62 0.41	0.60 0.41	0.33 0.28	0.71 0.48	0.38 0.37	
CV.min	0.76 0.66	0.72 0.62	0.48 0.42	0.77 0.60	0.54 0.49	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.72 0.57	0.69 0.57	0.59 0.56	0.75 0.55	1	$\rho = 0.5$
AIC	0.90 0.95	0.90 0.94	0.90 0.92	0.82 0.75		,
BIC	0.01 0.01	0.00 0.01	0.00 0.00	0.09 0.04		$\bar{s}_{Oracle} = 89.7$
CV.1se	0.06 0.04	0.18 0.10	0.18 0.10	0.65 0.18	0.61 0.30	
CV.min	0.59 0.20	0.63 0.35	0.43 0.24	0.73 0.29	0.72 0.43	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.67 0.16	0.32 0.14	0.21 0.16	0.73 0.28	***- ****	$\rho = 0.9$
AIC	0.87 0.88	0.86 0.88	0.86 0.85	0.73 0.29		,
BIC	0.06 0.01	0.01 0.01	0.00 0.01	0.11 0.03		$\bar{s}_{Oracle} = 86.2$
CV.1se	0.09 0.06	0.03 0.02	0.00 0.00	0.65 0.45	0.07 0.05	
CV.min	0.61 0.41	0.36 0.23	0.07 0.05	0.81 0.64	0.59 0.40	$sd(\mu)/\sigma = 0.5$
AICc	0.63 0.43	0.30 0.21	0.00 0.00	0.76 0.57		$\rho = 0$
AIC	0.94 0.92	0.94 0.90	0.94 0.90	0.90 0.81		,
BIC	0.01 0.01	0.00 0.00	0.00 0.00	0.06 0.04		$\bar{s}_{Oracle} = 55.9$
CV.1se	0.01 0.00	0.00 0.00	0.00 0.00	0.68 0.16	0.16 0.01	
CV.min	0.44 0.07	0.31 0.04	0.10 0.01	0.85 0.38	0.47 0.07	$sd(\mu)/\sigma = 0.5$
AICc	0.63 0.13	0.11 0.02	0.00 0.00	0.84 0.32	0.17 0.07	$\rho = 0.5$
AIC	0.94 0.94	0.94 0.93	0.94 0.91	0.91 0.74		,
BIC	0.02 0.00	0.00 0.00	0.00 0.00	0.09 0.01		$\bar{s}_{Oracle} = 55.6$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.14 0.03	0.00 0.01	
CV.1sc CV.min	0.54 0.04	0.44 0.03	0.00 0.01	0.14 0.03	0.00 0.01	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.66 0.05	0.12 0.02	0.00 0.02	0.82 0.10	0.17 0.02	$\rho = 0.9$
AIC	0.00 0.03	0.12 0.02	0.00 0.02	0.84 0.29		,
BIC	0.95 0.88	0.93 0.87	0.94 0.83	0.04 0.29		$\bar{s}_{Oracle} = 52.3$
БІС	0.00 0.02	0.01 0.02	0.00 0.01	0.03 0.03		

Table 129: FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.47 0.74	0.36 0.68	0.15 0.52	0.41 0.64	0.38 0.70	
CV.min	0.58 0.82	0.50 0.77	0.26 0.61	$0.51 \mid 0.71$	$0.54 \mid 0.80$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.46 0.73	0.40 0.70	0.35 0.67	$0.45 \mid 0.67$		$\rho = 0$
AIC	0.75 0.93	0.75 0.92	0.75 0.89	$0.57 \mid 0.76$		$\bar{s}_{Oracle} = 209.8$
BIC	0.06 0.21	0.08 0.34	0.08 0.41	0.19 0.42		SOracle - 209.6
CV.1se	0.60 0.72	0.55 0.67	0.38 0.55	0.58 0.52	0.37 0.55	
CV.min	0.66 0.82	0.61 0.79	0.46 0.65	0.62 0.62	0.44 0.62	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 0.66	0.54 0.66	0.44 0.65	0.59 0.56		$\rho = 0.5$
AIC	0.75 0.94	0.75 0.94	0.74 0.92	0.65 0.69		200.4
BIC	0.01 0.00	0.00 0.00	0.07 0.12	0.05 0.02		$\bar{s}_{Oracle} = 209.4$
CV.1se	0.65 0.72	0.62 0.68	0.53 0.57	0.57 0.13	0.50 0.51	
CV.min	0.68 0.83	0.66 0.80	0.56 0.68	0.61 0.21	0.53 0.59	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.63 0.62	0.61 0.65	0.54 0.65	0.61 0.20	,	$\rho = 0.9$
AIC	0.69 0.84		0.65 0.83	0.61 0.22		- 205.7
BIC	0.05 0.01	0.01 0.01	0.00 0.01	0.06 0.01		$\bar{s}_{Oracle} = 205.7$
CV.1se	0.41 0.47		0.06 0.11	0.51 0.56	0.40 0.47	
CV.min	0.61 0.67		0.18 0.25	0.62 0.67	0.61 0.67	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.53 0.58		0.48 0.49	0.56 0.61		$\rho = 0$
AIC	0.84 0.92		0.85 0.89	0.74 0.80		,
BIC	0.00 0.01	0.00 0.00	0.00 0.00	0.06 0.09		$\bar{s}_{Oracle} = 143.5$
CV.1se	0.17 0.06		0.01 0.00	0.65 0.34	0.23 0.09	
CV.rise CV.min	0.61 0.39		0.11 0.03	0.71 0.49	0.55 0.33	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.61 0.31	0.52 0.34	0.53 0.45	0.69 0.42	0.55 0.55	$\rho = 0.5$
AIC	0.84 0.94		0.84 0.90	0.78 0.74		,
BIC	0.01 0.00		0.00 0.00	0.06 0.01		$\bar{s}_{Oracle} = 143.5$
CV.1se	0.00 0.00		0.00 0.00	0.38 0.05	0.01 0.01	
CV.13C	0.48 0.02		0.08 0.01	0.71 0.19	0.21 0.04	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58 0.03		0.00 0.01	0.71 0.19	0.21 0.04	$\rho = 0.9$
AIC	0.81 0.87		0.81 0.83	0.71 0.20		·
BIC	0.06 0.01	0.01 0.00	0.00 0.01	0.07 0.01		$\bar{s}_{Oracle} = 139.4$
CV.1se	0.04 0.01	0.01 0.01	0.00 0.01	0.67 0.34	0.09 0.01	
CV.1se CV.min	0.53 0.23		0.06 0.00	0.79 0.53	0.54 0.23	$sd(\mu)/\sigma = 0.5$
AICc	0.55 0.25		0.00 0.01	0.79 0.33	0.34 0.23	$\begin{array}{c c} \operatorname{sd}(\mu)/\sigma = 0.3 \\ \rho = 0 \end{array}$
AICC	0.00 0.27	0.14 0.07	0.92 0.90	$0.73 \mid 0.43$ $0.88 \mid 0.77$		$\rho = 0$
BIC				0.05 0.01		$\bar{s}_{Oracle} = 77.7$
	0.01 0.00	<u> </u>	0.08 0.07	<u> </u>	0.25 0.00	
CV.1se			$0.00 \mid 0.00$	0.64 0.09	0.25 0.00	-1()/- 0.5
CV.min	0.38 0.03		0.08 0.00	0.84 0.28	0.48 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.57 0.06		0.00 0.00	0.83 0.23		$\rho = 0.5$
AIC	0.92 0.92		0.92 0.90	0.89 0.70		$\bar{s}_{Oracle} = 77.7$
BIC	0.02 0.00		0.00 0.00	0.10 0.00	0.05 0.01	
CV.1se	0.00 0.00		0.00 0.00	0.07 0.01	0.05 0.01	1/)/
CV.min	0.49 0.03		0.14 0.01	0.81 0.07	0.32 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.64 0.04		0.01 0.01	0.82 0.08		$\rho = 0.9$
AIC	0.92 0.87		0.92 0.82	0.85 0.18		$\bar{s}_{Oracle} = 73.5$
BIC	0.04 0.01	0.01 0.01	0.00 0.00	0.11 0.01		J. Wester 1. 1. 1.

Table 130: FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.45 0.73	0.35 0.62	0.22 0.38	0.39 0.62	0.46 0.74	
CV.min	0.53 0.82	0.46 0.75	0.33 0.54	$0.46 \mid 0.70$	$0.55 \mid 0.84$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.39 0.64	0.36 0.63	$0.40 \mid 0.64$	0.39 0.62		$\rho = 0$
AIC	0.67 0.93	0.67 0.91	$0.67 \mid 0.88$	0.52 0.77		ā 203 2
BIC	$0.00 \mid 0.00$	$0.00 \mid 0.00$	0.28 0.43	0.02 0.04		$\bar{s}_{Oracle} = 293.2$
CV.1se	0.51 0.58	0.44 0.48	0.04 0.05	0.51 0.40	0.49 0.57	
CV.min	0.57 0.79	0.53 0.71	0.16 0.15	0.54 0.53	0.58 0.80	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47 0.36	0.47 0.52	0.46 0.63	0.51 0.43		$\rho = 0.5$
AIC	0.67 0.94	0.66 0.93	0.66 0.91	0.59 0.70		= 202.1
BIC	0.00 0.00	0.00 0.00	0.01 0.02	0.04 0.00		$\bar{s}_{Oracle} = 293.1$
CV.1se	0.19 0.20	0.17 0.18	0.00 0.00	0.30 0.04	0.10 0.09	
CV.min	0.53 0.50	0.47 0.44	0.08 0.02	0.57 0.16	0.34 0.31	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.47 0.03	0.16 0.08	0.51 0.63	0.56 0.16	,	$\rho = 0.9$
AIC	0.62 0.86	0.61 0.85	0.59 0.83	0.57 0.30		- 202.2
BIC	0.05 0.00	0.01 0.00	0.00 0.00	0.06 0.01		$\bar{s}_{Oracle} = 292.2$
CV.1se	0.35 0.28	0.12 0.07	0.00 0.00	0.48 0.45	0.36 0.29	
CV.min	0.55 0.55	0.34 0.27	0.04 0.02	0.57 0.57	0.55 0.55	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.46 0.41	0.47 0.42	0.37 0.32	0.51 0.48	1	$\rho = 0$
AIC	0.77 0.91	0.77 0.88	0.78 0.88	0.69 0.75		'
BIC	0.00 0.00	0.00 0.00	0.06 0.06	0.02 0.01		$\bar{s}_{Oracle} = 215.4$
CV.1se	0.02 0.00	0.01 0.00	0.00 0.00	0.58 0.19	0.14 0.00	
CV.min	0.39 0.08	0.21 0.03	0.06 0.00	0.65 0.36	0.40 0.09	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.48 0.10	0.12 0.04	0.21 0.16	0.63 0.27	01.10 0107	$\rho = 0.5$
AIC	0.77 0.92	0.77 0.90	0.77 0.89	0.72 0.70		,
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.05 0.00		$\bar{s}_{Oracle} = 215.2$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.10 0.01	0.01 0.00	
CV.min	0.44 0.02	0.36 0.01	0.10 0.01	0.66 0.07	0.24 0.01	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.53 0.03	0.10 0.01	0.00 0.00	0.67 0.09	0.2. 0.01	$\rho = 0.9$
AIC	0.75 0.85	0.75 0.84	0.75 0.80	0.69 0.33		,
BIC	0.04 0.00	0.01 0.00	0.00 0.00	0.09 0.01		$\bar{s}_{Oracle} = 211.7$
CV.1se	0.02 0.00	0.00 0.00	0.00 0.00	0.72 0.25	0.16 0.00	
CV.min	0.50 0.12	0.14 0.01	0.07 0.00	0.81 0.43	0.52 0.12	$sd(\mu)/\sigma = 0.5$
AICc	0.60 0.15	0.09 0.03	0.00 0.00	0.77 0.35	0.02 0.12	$\rho = 0$
AIC	0.91 0.90	0.91 0.89	0.91 0.91	0.88 0.72		'
BIC	0.01 0.00	0.00 0.00	0.65 0.64	0.07 0.00		$\bar{s}_{Oracle} = 91.3$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.64 0.06	0.28 0.00	
CV.rise CV.min	0.38 0.02	0.20 0.00	0.08 0.00	0.84 0.22	0.50 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.58 0.04	0.03 0.00	0.00 0.00	0.83 0.18	0.50 0.02	$\rho = 0.5$
AIC	0.91 0.91	0.91 0.89	0.91 0.90	0.89 0.66		
BIC	0.02 0.00	$0.01 \mid 0.00$	0.02 0.02	0.11 0.00		$\bar{s}_{Oracle} = 90.9$
CV.1se	0.02 0.00	0.00 0.00	0.02 0.02	0.07 0.00	0.19 0.00	
CV.1sc CV.min	0.42 0.02	0.00 0.00	0.00 0.00	0.82 0.05	0.19 0.00	$sd(\mu)/\sigma = 0.5$
AICc	0.59 0.03	0.07 0.00	$0.13 \mid 0.01$ $0.00 \mid 0.00$	0.82 0.03	0.77 0.01	$\rho = 0.9$
AIC	0.91 0.85	0.07 0.00	0.00 0.00	0.85 0.00		
BIC	0.91 0.83	0.91 0.82	$0.91 \mid 0.82$ $0.00 \mid 0.00$	0.83 0.13		$\bar{s}_{Oracle} = 87.0$
БІС	0.02 0.00	0.01 0.00	0.00 0.00	0.10 0.01		

Table 131: FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.33 0.26	0.19 0.24	0.01 0.20	0.22 0.22	0.01 0.19	
CV.min	0.67 0.33	0.59 0.31	0.20 0.24	0.51 0.26	0.19 0.24	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.65 0.33	0.58 0.31	0.34 0.27	0.48 0.26		$\rho = 0$
AIC	0.88 0.72	0.88 0.72	$0.88 \mid 0.69$	0.49 0.26		$\bar{s}_{Oracle} = 100.0$
BIC	0.20 0.24	0.13 0.23	0.01 0.20	0.16 0.21		<i>SOracle</i> – 100.0
CV.1se	0.38 0.26	0.23 0.24	0.02 0.20	0.26 0.22	0.01 0.19	
CV.min	0.69 0.34	0.62 0.31	0.23 0.24	0.53 0.26	0.19 0.24	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.67 0.33	0.60 0.31	0.37 0.27	0.51 0.25	•	$\rho = 0.5$
AIC	0.88 0.72	0.88 0.72	0.88 0.69	0.51 0.25		- 100.0
BIC	0.23 0.23	0.14 0.23	0.01 0.20	0.19 0.20		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.41 0.26	0.26 0.24	0.03 0.20	0.28 0.21	0.01 0.19	
CV.min	0.70 0.34	0.63 0.31	0.26 0.24	0.53 0.25	0.21 0.24	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.68 0.33	0.61 0.30	0.38 0.27	0.51 0.25	'	$\rho = 0.9$
AIC	0.88 0.71	0.88 0.71	0.88 0.69	0.52 0.25		,
BIC	0.25 0.23	0.16 0.22	0.02 0.20	0.21 0.20		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.25 0.17	0.12 0.15	0.01 0.12	0.42 0.19	0.01 0.12	
CV.min	0.66 0.25	0.56 0.22	0.14 0.16	0.74 0.28	0.24 0.17	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.66 0.25	0.59 0.23	0.32 0.20	0.71 0.26	0.21 0.17	$\rho = 0$
AIC	0.89 0.79	0.89 0.79	0.89 0.76	$0.71 \mid 0.20$ $0.79 \mid 0.32$,
BIC	0.18 0.16	0.09 0.15	0.00 0.12	0.15 0.15		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.10 0.10	0.05 0.15	0.00 0.12	0.46 0.19	0.01 0.12	
CV.1sc CV.min	0.29 0.17	0.13 0.13	0.01 0.12	0.76 0.28	0.01 0.12	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.68 0.25	0.60 0.23	0.14 0.10	0.70 0.26	0.22 0.17	$\rho = 0.5$
AIC	0.89 0.23	0.89 0.79	0.34 0.20	0.72 0.20		$\rho = 0.5$
BIC		0.89 0.79	0.00 0.12	,		$\bar{s}_{Oracle} = 100.0$
	0.20 0.15	<u> </u>	<u>'</u>	0.17 0.15	0.01 0.12	
CV.1se	0.33 0.17	0.17 0.15	0.02 0.12	0.47 0.19	0.01 0.12	_1()/_ 1
CV.min	0.69 0.25	0.61 0.22	0.17 0.16	0.75 0.28	0.25 0.17	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.69 0.25	0.62 0.23	0.36 0.20	0.72 0.26		$\rho = 0.9$
AIC	0.89 0.79	0.89 0.78	0.89 0.76	0.79 0.31		$\bar{s}_{Oracle} = 100.0$
BIC	0.21 0.15	0.12 0.14	0.01 0.11	0.19 0.14	0.04 0.07	
CV.1se	0.11 0.07	0.05 0.06	0.01 0.05	0.56 0.14	0.01 0.05	1/)/
CV.min	0.64 0.15	0.50 0.13	0.13 0.08	0.81 0.26	0.35 0.11	$sd(\mu)/\sigma = 0.5$
AICc	0.67 0.17	0.55 0.14	0.20 0.11	0.78 0.22		$\rho = 0$
AIC	0.90 0.85	0.90 0.84	0.90 0.83	0.87 0.42		$\bar{s}_{Oracle} = 100.0$
BIC	0.12 0.08	0.05 0.07	0.00 0.03	0.16 0.08		-Oracle
CV.1se	0.13 0.07	0.07 0.06	0.01 0.05	0.61 0.14	0.01 0.05	
CV.min	0.67 0.15	0.54 0.13	0.14 0.08	0.82 0.25	0.33 0.10	$\int \operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.69 0.17	0.59 0.14	0.23 0.11	$0.78 \mid 0.22$		$\rho = 0.5$
AIC	$0.90 \mid 0.85$	$0.90 \mid 0.84$	$0.90 \mid 0.83$	$0.87 \mid 0.42$		$\bar{s}_{Oracle} = 100.0$
BIC	0.12 0.07	$0.06 \mid 0.06$	$0.00 \mid 0.03$	0.18 0.08		SUracle = 100.0
CV.1se	0.15 0.07	0.08 0.06	0.02 0.04	0.60 0.14	0.02 0.05	
CV.min	0.68 0.15	0.56 0.13	0.15 0.08	0.81 0.25	0.34 0.10	$sd(\mu)/\sigma = 0.5$
AICc	$0.70 \mid 0.17$	0.60 0.14	0.26 0.11	0.79 0.21		$\rho = 0.9$
AIC	0.90 0.85	0.90 0.84	0.90 0.83	0.86 0.41		ē – 100 0
BIC	0.13 0.07	0.06 0.06	0.00 0.03	0.19 0.08		$\bar{s}_{Oracle} = 100.0$
	<u> </u>	<u> </u>	· · · · · · · · · · · · · · · · · · ·	<u> </u>		

Table 132: FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.50 0.86	0.36 0.82	0.07 0.69	0.44 0.77	0.11 0.72	
CV.min	0.66 0.92	$0.57 \mid 0.89$	0.19 0.78	$0.59 \mid 0.83$	0.36 0.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 0.89	0.50 0.88	0.40 0.85	0.55 0.81		$\rho = 0$
AIC	$0.87 \mid 0.97$	$0.87 \mid 0.96$	0.87 0.94	$0.64 \mid 0.85$		_ 100.0
BIC	0.24 0.72	0.14 0.70	0.02 0.60	0.23 0.66		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.54 0.86	0.40 0.82	0.07 0.68	0.47 0.76	0.10 0.71	
CV.min	0.68 0.92	0.59 0.90	0.20 0.78	0.61 0.82	0.34 0.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.59 0.88	0.53 0.87	0.42 0.86	0.57 0.81		$\rho = 0.5$
AIC	0.87 0.97	0.87 0.97	0.87 0.95	0.67 0.85		100.0
BIC	0.26 0.70	0.16 0.69	0.03 0.60	0.26 0.64		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.55 0.86	0.42 0.82	0.09 0.69	0.48 0.75	0.13 0.72	
CV.min	0.69 0.92	0.60 0.90	0.23 0.78	0.61 0.82	0.36 0.83	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.60 0.88	0.53 0.87	0.42 0.85	0.57 0.80	,	$\rho = 0.9$
AIC	0.87 0.97	0.87 0.97	0.87 0.95	0.67 0.85		- 100.0
BIC	0.28 0.70	0.18 0.68	0.04 0.60	0.28 0.64		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.41 0.53	0.26 0.45	0.07 0.31	0.50 0.56	0.24 0.44	
CV.min	0.64 0.67	0.52 0.60	0.19 0.42	0.66 0.67	0.54 0.62	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58 0.64	0.53 0.61	0.60 0.63	0.61 0.63	1	$\rho = 0$
AIC	0.89 0.92	0.89 0.91	0.89 0.89	0.78 0.77		,
BIC	0.08 0.24	0.06 0.27	0.01 0.12	0.17 0.35		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.45 0.52	0.30 0.45	0.08 0.31	0.54 0.56	0.21 0.41	
CV.min	0.66 0.67	0.55 0.60	0.20 0.42	0.68 0.66	0.52 0.59	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.60 0.63	0.55 0.60	0.60 0.63	0.63 0.63	1	$\rho = 0.5$
AIC	0.89 0.92	0.89 0.92	0.89 0.89	0.79 0.77		,
BIC	0.06 0.18	0.07 0.24	0.01 0.12	0.18 0.32		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.47 0.52	0.33 0.45	0.10 0.30	0.54 0.55	0.24 0.42	
CV.min	0.66 0.67	0.56 0.60	0.22 0.41	0.68 0.65	0.53 0.59	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.61 0.62	0.56 0.60	0.59 0.62	0.63 0.62	0.00 0.00	$\rho = 0.9$
AIC	0.89 0.93	0.89 0.91	0.89 0.89	0.79 0.76		,
BIC	0.07 0.16	0.08 0.23	0.01 0.11	0.20 0.31		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.08 0.03	0.03 0.01	0.00 0.00	0.59 0.28	0.07 0.03	
CV.min	0.56 0.26	0.31 0.13	0.07 0.03	0.75 0.44	0.55 0.25	$sd(\mu)/\sigma = 0.5$
AICc	0.59 0.27	0.58 0.28	0.21 0.12	0.71 0.38	*****	$\rho = 0$
AIC	0.90 0.90	0.90 0.89	0.90 0.89	0.85 0.67		,
BIC	0.01 0.00	0.01 0.01	0.00 0.00	0.05 0.03		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.07 0.02	0.03 0.01	0.00 0.00	0.62 0.27	0.08 0.02	
CV.min	0.56 0.23	0.33 0.12	0.07 0.02	0.76 0.43	0.54 0.22	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.59 0.25	0.58 0.26	0.27 0.15	0.72 0.37	0.51 0.22	$\rho = 0.5$
AIC	0.90 0.90	0.90 0.89	0.90 0.89	0.86 0.68		,
BIC	0.00 0.00	0.00 0.00	0.00 0.00	0.05 0.02		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.07 0.02	0.03 0.01	0.00 0.00	0.62 0.26	0.08 0.01	
CV.1sc CV.min	0.58 0.23	0.05 0.01	0.00 0.00	0.02 0.20	0.55 0.22	$sd(\mu)/\sigma = 0.5$
AICc	0.56 0.25	0.60 0.26	0.09 0.02	0.70 0.42	0.55 0.22	$\rho = 0.9$
AIC	0.01 0.23	0.90 0.89	0.20 0.14	0.72 0.30		,
BIC	0.90 0.90	0.90 0.89	0.90 0.89	0.06 0.02		$\bar{s}_{Oracle} = 100.0$
ыс	0.01 0.00	0.01 0.00	0.00 0.00	0.00 0.02		

Table 133: FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 100.

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AICc
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BIC 0.30 0.93 0.19 0.93 0.03 0.87 0.29 0.87 Soracle = 100.0 CV.1se 0.57 0.98 0.41 0.98 0.09 0.94 0.49 0.93 0.08 0.94 CV.min 0.69 0.99 0.59 0.99 0.19 0.97 0.61 0.96 0.21 0.97 AICc 0.60 0.99 0.51 0.99 0.28 0.98 0.56 0.95 AIC 0.87 1.00 0.87 1.00 0.87 0.99 0.69 0.97 BIC 0.33 0.92 0.22 0.93 0.04 0.88 0.32 0.86 CV.1se 0.58 0.99 0.43 0.98 0.11 0.94 0.50 0.93 0.11 0.95 CV.min 0.70 0.99 0.59 0.99 0.21 0.97 0.61 0.95 0.23 0.97 BIC 0.34 0.92 0.24 0.93 0.05 0.88 0.34 0.85 CV.1se 0.43 0.66 0.28 0.55 0.09 0.31 0.51 0.71 0.38 0.65 CV.min 0.64 0.82 0.51 0.74 0.22 0.49 0.64 0.81 0.62 0.81 AICc 0.89 0.95 0.89 0.93 0.89 0.91 0.78 0.89 BIC 0.00 0.02 0.02 0.09 0.00 0.01 0.10 0.27 CV.lse 0.46 0.65 0.82 0.55 0.10 0.30 0.54 0.70 0.40 0.63 CV.min 0.66 0.82 0.55 0.74 0.23 0.49 0.66 0.80 0.63 0.81 AICc 0.58 0.76 0.54 0.75 0.59 0.75 0.59 0.75 AIC 0.89 0.95 0.89 0.93 0.89 0.91 0.78 0.89 BIC 0.00 0.01 0.01 0.05 0.00 0.01 0.10 0.27 CV.lse 0.48 0.65 0.34 0.75 0.59 0.75 0.59 0.75 AIC 0.89 0.95 0.89 0.93 0.89 0.91 0.79 0.89 BIC 0.00 0.01 0.01 0.05 0.00 0.01 0.09 0.20 CV.lse 0.48 0.65 0.34 0.55 0.74 0.25 0.47 0.66 0.80 0.63 0.81 AICc 0.59 0.76 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 AICc 0.59 0.76 0.55 0.75 0.60 0.75 0.61 0.75 0.61 0.75 AICc 0.59 0.76 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 AICc 0.55 0.76 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 AICc 0.55 0.76 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 AICc 0.55 0.26 0.59 0.30 0.01 0.00 0.00 0.00 0.00 0.00 0.00 CV.lse 0.44 0.02 0.01 0.01 0.04 0.00 0.05
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BIC 0.33 0.92 0.22 0.93 0.04 0.88 0.32 0.86 Soracle = 100.0 CV.Ise 0.58 0.99 0.43 0.98 0.11 0.94 0.50 0.93 0.11 0.95 CV.min 0.70 0.99 0.59 0.99 0.21 0.97 0.61 0.95 0.23 0.97 sd(μ)/σ = 2 AICc 0.60 0.99 0.52 0.99 0.29 0.97 0.57 0.94 ρ = 0.9 AIC 0.87 1.00 0.87 1.00 0.87 0.99 0.69 0.97 BIC 0.34 0.92 0.24 0.93 0.05 0.88 0.34 0.85 CV.Ise 0.43 0.66 0.28 0.55 0.09 0.31 0.51 0.71 0.38 0.65 CV.min 0.64 0.82 0.51 0.74 0.22 0.49 0.64 0.81 0.62 0.81 sd(μ)/σ = 1 AICc 0.57 0.77 0.52 0.75 0.59 0.75 0.59 0.77 ρ = 0 AIC 0.89 0.95 0.89 0.93 0.89 0.91 0.78 0.89 BIC 0.00 0.02 0.02 0.09 0.00 0.01 0.10 0.27 CV.Ise 0.46 0.65 0.31 0.55 0.10 0.30 0.54 0.70 0.40 0.63 CV.min 0.65 0.82 0.53 0.74 0.23 0.49 0.66 0.80 0.63 0.81 sd(μ)/σ = 1 AICc 0.58 0.76 0.54 0.75 0.59 0.76 0.60 0.76 AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.89 BIC 0.00 0.01 0.01 0.05 0.00 0.01 0.09 0.20 CV.Ise 0.48 0.65 0.34 0.54 0.12 0.29 0.55 0.69 0.41 0.62 CV.min 0.66 0.82 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 sd(μ)/σ = 1 AICc 0.59 0.76 0.55 0.75 0.60 0.75 0.61 0.75 AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 BIC 0.00 0.01 0.01 0.04 0.00 0.01 0.09 0.17 CV.Ise 0.48 0.65 0.34 0.54 0.12 0.29 0.55 0.69 0.41 0.62 CV.min 0.66 0.82 0.55 0.75 0.60 0.75 0.61 0.75 AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 BIC 0.00 0.01 0.01 0.04 0.00 0.01 0.09 0.17 CV.Ise 0.04 0.02 0.01 0.00 0.00 0.00 0.09 0.17 CV.Ise 0.04 0.02 0.01 0.00 0.00 0.00 0.09 0.17 CV.Ise 0.04 0.02 0.01 0.00 0.00 0.00 0.09 0.17 CV.Ise 0.04 0.02 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.00
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AIC 0.87 1.00 0.87 1.00 0.87 0.99 0.69 0.97 BIC 0.34 0.92 0.24 0.93 0.05 0.88 0.34 0.85 0.34 0.85 0.34 0.85 0.06 0.28 0.55 0.09 0.31 0.51 0.71 0.38 0.65 0.62 0.81 $sd(\mu)/\sigma = 1$ AICc 0.57 0.77 0.52 0.75 0.59 0.75 0.59 0.77 0.77 0.52 0.75 0.59 0.75 0.59 0.77 0.70 0.40 0.63 0.81 0.65 0.80 0.93 0.89 0.91 0.78 0.89 0.81 0.65 0.80 0.81 0.65 0.80 0.93 0.89 0.91 0.78 0.89 0.80 0.64 0.81 0.65 0.82 0.53 0.74 0.23 0.49 0.66 0.80 0.63 0.81 $sd(\mu)/\sigma = 1$ AICc 0.58 0.76 0.54 0.75 0.59 0.76 0.60 0.76 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.60 0.75 0.61 0.75 0.60 0.75 0
BIC 0.34 0.92 0.24 0.93 0.05 0.88 0.34 0.85 Soracle = 100.0 CV.1se 0.43 0.66 0.28 0.55 0.09 0.31 0.51 0.71 0.38 0.65 CV.min 0.64 0.82 0.51 0.74 0.22 0.49 0.64 0.81 0.62 0.81 sd(μ)/σ = 1 AICc 0.57 0.77 0.52 0.75 0.59 0.75 0.59 0.77 ρ = 0 AIC 0.89 0.95 0.89 0.93 0.89 0.91 0.78 0.89 BIC 0.00 0.02 0.02 0.09 0.00 0.01 0.10 0.27 CV.1se 0.46 0.65 0.31 0.55 0.10 0.30 0.54 0.70 0.40 0.63 CV.min 0.65 0.82 0.53 0.74 0.23 0.49 0.66 0.80 0.63 0.81 sd(μ)/σ = 1 AICc 0.58 0.76 0.54 0.75 0.59 0.76 0.60 0.76 ρ = 0.5 AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.89 BIC 0.00 0.01 0.01 0.05 0.00 0.01 0.09 0.20 CV.1se 0.48 0.65 0.34 0.54 0.12 0.29 0.55 0.69 0.41 0.62 CV.min 0.66 0.82 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 sd(μ)/σ = 1 AICc 0.59 0.76 0.55 0.75 0.60 0.75 0.61 0.75 ρ = 0.9 AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 BIC 0.00 0.01 0.01 0.04 0.00 0.01 0.09 0.17 CV.1se 0.04 0.02 0.01 0.00 0.00 0.00 0.59 0.30 0.08 0.01 CV.1se 0.04 0.02 0.01 0.00 0.00 0.00 0.59 0.30 0.08 0.01 CV.1se 0.04 0.02 0.01 0.00 0.00 0.00 0.59 0.30 0.08 0.01 CV.nin 0.51 0.24 0.20 0.06 0.05 0.01 0.74 0.49 0.50 0.23 sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 0.49 0.50 0.23 sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 0.69 0.55 0.59 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.50 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.55 0.
CV.1se 0.43 0.66 0.28 0.55 0.09 0.31 0.51 0.71 0.38 0.65 0.62 0.81 Sd(μ)/σ = 1 AICc 0.57 0.77 0.52 0.75 0.59 0.75 0.59 0.77 0.52 0.76 0.89 0.91 0.78 0.89 0.91 0.78 0.89 0.91 0.78 0.89 0.91 0.78 0.89 0.91 0.65 0.82 0.53 0.74 0.23 0.49 0.66 0.80 0.63 0.81 Sd(μ)/σ = 1 AICc 0.58 0.76 0.54 0.75 0.59 0.76 0.60 0.76 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.89 0.89 0.81 Sd(μ)/σ = 1 AICc 0.58 0.76 0.54 0.75 0.59 0.76 0.60 0.76 0.63 0.81 Sd(μ)/σ = 1 AICc 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.89 BIC 0.00 0.01 0.01 0.05 0.00 0.01 0.09 0.20 Soracle = 100.0 Soracle = 100.0 CV.1se 0.48 0.65 0.34 0.54 0.12 0.29 0.55 0.69 0.41 0.62 CV.min 0.66 0.82 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 Sd(μ)/σ = 1 AICc 0.59 0.76 0.55 0.75 0.60 0.75 0.61 0.75 0.64 0.80 Soracle = 100.0 AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 BIC 0.00 0.01 0.01 0.04 0.00 0.01 0.09 0.17 Soracle = 100.0 Soracle = 100.0 CV.1se 0.04 0.02 0.01 0.04 0.00 0.01 0.09 0.17 Soracle = 100.0 Soracle = 100.0 AIC 0.55 0.26 0.59 0.30 0.14 0.09 0.41 0.49 0.50 0.23 Sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 0.49 0.50 0.23 Sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 0.49 0.50 0.23 Sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 0.49 0.50 0.23 Sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 0.49 0.50 0.23 Sd(μ)/σ = 0.5 AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.85 0.73 Soracle = 100.0 AICc 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73 Soracle = 100.0 AICc 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73 Soracle = 100.0 AICc 0.90
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BIC 0.00 0.02 0.09 0.00 0.01 0.10 0.27 $s_{Oracle} = 100.0$ CV.1se 0.46 0.65 0.31 0.55 0.10 0.30 0.54 0.70 0.40 0.63 0.81 $sd(\mu)/\sigma = 1$ AICc 0.58 0.76 0.54 0.75 0.59 0.76 0.60 0.76 0.63 0.81 $sd(\mu)/\sigma = 1$ AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.89 0.20 $s_{Oracle} = 100.0$ CV.1se 0.48 0.65 0.34 0.54 0.12 0.29 0.55 0.69 0.41 0.62 $s_{Oracle} = 100.0$ CV.min 0.66 0.82 0.55 0.74 0.25 0.47 0.66 0.79 0.64 0.80 $sd(\mu)/\sigma = 1$ AICc 0.59 0.76 0.55 0.75 0.60 0.75 0.61 0.75 0.64 0.80 $sd(\mu)/\sigma = 1$ AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 $so(\mu)/\sigma = 1$ AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 $so(\mu)/\sigma = 1$ AIC 0.89 0.95 0.89 0.94 0.89 0.91 0.79 0.88 $so(\mu)/\sigma = 1$ AIC 0.80 0.01 0.04 0.00 0.01 0.09 0.17 $so(\mu)/\sigma = 1$ CV.1se 0.04 0.02 0.01 0.04 0.00 0.01 0.09 0.17 $so(\mu)/\sigma = 1$ AIC 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 $so(\mu)/\sigma = 0.5$ AIC 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 $so(\mu)/\sigma = 0.5$ AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73 $so(\mu)/\sigma = 0.5$
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BIC $0.00 \mid 0.01$ $0.01 \mid 0.05$ $0.00 \mid 0.01$ $0.09 \mid 0.20$ $s_{Oracle} = 100.0$ CV.1se $0.48 \mid 0.65$ $0.34 \mid 0.54$ $0.12 \mid 0.29$ $0.55 \mid 0.69$ $0.41 \mid 0.62$ CV.min $0.66 \mid 0.82$ $0.55 \mid 0.74$ $0.25 \mid 0.47$ $0.66 \mid 0.79$ $0.64 \mid 0.80$ $sd(\mu)/\sigma = 1$ AICc $0.59 \mid 0.76$ $0.55 \mid 0.75$ $0.60 \mid 0.75$ $0.61 \mid 0.75$ $\rho = 0.9$ AIC $0.89 \mid 0.95$ $0.89 \mid 0.94$ $0.89 \mid 0.91$ $0.79 \mid 0.88$ $s_{Oracle} = 100.0$ BIC $0.00 \mid 0.01$ $0.01 \mid 0.04$ $0.00 \mid 0.01$ $0.09 \mid 0.17$ $s_{Oracle} = 100.0$ CV.1se $0.04 \mid 0.02$ $0.01 \mid 0.00$ $0.00 \mid 0.01$ $0.09 \mid 0.17$ $s_{Oracle} = 100.0$ CV.min $0.51 \mid 0.24$ $0.20 \mid 0.06$ $0.05 \mid 0.01$ $0.74 \mid 0.49$ $0.50 \mid 0.23$ $sd(\mu)/\sigma = 0.5$ AICc $0.55 \mid 0.26$ $0.59 \mid 0.30$ $0.14 \mid 0.09$ $0.69 \mid 0.41$ $\rho = 0$ AIC $0.90 \mid 0.91$ $0.90 \mid 0.89$ $0.90 \mid 0.90$ $0.85 \mid 0.73$ $0.85 \mid 0.73$
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BIC 0.00 0.01 0.04 0.04 0.00 0.01 0.09 0.17 $s_{Oracle} = 100.0$ CV.1se 0.04 0.02 0.01 0.00 0.00 0.00 0.59 0.30 0.08 0.01 CV.min 0.51 0.24 0.20 0.06 0.05 0.01 0.74 0.49 0.50 0.23 $sd(\mu)/\sigma = 0.5$ AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 $\rho = 0$ AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73 $\bar{\rho} = 0$
CV.1se 0.04 0.02 0.01 0.00 0.00 0.00 0.59 0.30 0.08 0.01 CV.min 0.51 0.24 0.20 0.06 0.05 0.01 0.74 0.49 0.50 0.23 $sd(\mu)/\sigma = 0.5$ AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 $\rho = 0$ AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73
CV.min 0.51 0.24 0.20 0.06 0.05 0.01 0.74 0.49 0.50 0.23 $sd(\mu)/\sigma = 0.5$ AICc 0.55 0.26 0.59 0.30 0.14 0.09 0.69 0.41 $\rho = 0$ AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73 $\bar{\rho} = 0$
AICc $0.55 \mid 0.26 0.59 \mid 0.30 0.14 \mid 0.09 0.69 \mid 0.41$ AIC $0.90 \mid 0.91 0.90 \mid 0.89 0.90 \mid 0.90 0.85 \mid 0.73$
AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73
210 0.00 0.00 0.00 0.00 0.00 0.00
CV.1se 0.04 0.01 0.00 0.00 0.00 0.00 0.62 0.29 0.08 0.01
CV.min 0.48 0.20 0.19 0.05 0.04 0.01 0.75 0.47 0.48 0.19 $\operatorname{sd}(\mu)/\sigma = 0.5$
AICc $0.55 \mid 0.23 0.58 \mid 0.28 0.17 \mid 0.10 0.71 \mid 0.40$
AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.73
BIC $0.00 \mid 0.00 \mid 0.0$
CV.1se 0.03 0.01 0.01 0.00 0.00 0.02 0.27 0.10 0.01
CV.min 0.51 0.19 0.21 0.05 0.06 0.01 0.75 0.46 0.50 0.19 $\operatorname{sd}(\mu)/\sigma = 0.5$
AICc $0.57 \mid 0.23 0.59 \mid 0.28 0.16 \mid 0.09 0.71 \mid 0.39$ $\rho = 0.9$
AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.72
BIC $0.90 \mid 0.90 \mid 0.89 \mid 0.90 \mid 0.9$

Table 134: FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 200.

$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\;\gamma=10$	marginal AL	sparsenet MCP	
AICC	CV.1se		0.35 1.00	0.06 0.99	0.46 0.98	0.04 0.98	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	CV.min		0.54 1.00	0.13 1.00	$0.58 \mid 0.99$	0.13 0.99	$\operatorname{sd}(\mu)/\sigma = 2$
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	AICc	0.58 1.00	0.46 1.00	0.11 0.99	$0.53 \mid 0.98$		$\rho = 0$
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	AIC	0.87 1.00	0.87 1.00	$0.87 \mid 0.99$	$0.68 \mid 0.99$		ā - · - 100 0
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	BIC	0.34 0.99	0.20 0.99	0.03 0.96	0.33 0.95		<i>SOracle</i> – 100.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	0.58 1.00	0.39 1.00	0.06 0.99	0.49 0.97	0.04 0.99	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	0.70 1.00	0.56 1.00	0.13 1.00	$0.60 \mid 0.98$	0.13 1.00	$\operatorname{sd}(\mu)/\sigma = 2$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	AICc	0.60 1.00	0.48 1.00	0.11 0.99	$0.56 \mid 0.98$		$\rho = 0.5$
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	AIC	0.87 1.00	0.87 1.00	$0.87 \mid 0.99$	$0.70 \mid 0.99$		= -100.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	$0.37 \mid 0.98$	0.23 0.99	$0.03 \mid 0.97$	0.36 0.94		$s_{Oracle} = 100.0$
AICC 0.61 1.00 0.49 1.00 0.12 0.99 0.57 0.98 $\rho = 0.9$ AIC 0.87 1.00 0.87 1.00 0.87 0.99 0.70 0.99 $\bar{s}_{Oracle} = 100.0$ $\bar{s}_{Oracle} = 100.0$	CV.1se	0.59 1.00	0.41 1.00	0.09 0.99	0.51 0.97	0.07 0.99	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	0.70 1.00	0.57 1.00	0.16 1.00	0.61 0.98	0.15 1.00	$\operatorname{sd}(\mu)/\sigma = 2$
BIC 0.39 0.98 0.25 0.99 0.04 0.97 0.38 0.94 Soracle = 100.0 CV.1se	AICc	0.61 1.00	0.49 1.00	0.12 0.99	0.57 0.98		$\rho = 0.9$
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	AIC	0.87 1.00	0.87 1.00	$0.87 \mid 0.99$	$0.70 \mid 0.99$		= -100.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	BIC	0.39 0.98	0.25 0.99	0.04 0.97	0.38 0.94		$s_{Oracle} = 100.0$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	0.43 0.72	0.27 0.57	0.09 0.25	0.51 0.77	0.41 0.72	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	0.63 0.87	0.49 0.79	0.21 0.48	0.64 0.86	0.63 0.87	$\operatorname{sd}(\mu)/\sigma = 1$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	AICc	0.56 0.82	0.52 0.81	$0.60 \mid 0.80$	0.58 0.82	,	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	AIC	0.89 0.96	0.89 0.94	0.89 0.91	,		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	BIC	0.00 0.00	0.01 0.04	0.00 0.01	,		$s_{Oracle} = 100.0$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	0.46 0.70	0.30 0.57	0.09 0.22		0.43 0.70	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min			'			$\operatorname{sd}(\mu)/\sigma = 1$
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	AICc	0.58 0.81	0.54 0.81	0.59 0.81	0.60 0.81	,	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	AIC	0.89 0.96	0.89 0.95	0.89 0.92	,		- 100.0
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	BIC	0.00 0.00	0.00 0.02	0.00 0.00	0.04 0.09		$s_{Oracle} = 100.0$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	0.48 0.70	0.33 0.56	0.09 0.20	0.55 0.74	0.45 0.69	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.min	0.66 0.87	0.53 0.79	0.23 0.43	,		$\operatorname{sd}(\mu)/\sigma = 1$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$,	'	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	AIC	0.89 0.96	0.89 0.94	0.89 0.92	,		_ 100.0
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		'			,		$s_{Oracle} = 100.0$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$				<u>'</u>		0.09 0.01	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$				'			$\operatorname{sd}(\mu)/\sigma = 0.5$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	AICc	0.54 0.25	0.60 0.32	0.09 0.06	,	'	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		0.90 0.91	0.90 0.89	0.90 0.90	,		- 100.0
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		0.00 0.00	0.00 0.00	0.00 0.00	,		$s_{Oracle} = 100.0$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	CV.1se	0.03 0.01	0.00 0.00	0.00 0.00	0.62 0.29	0.10 0.01	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		'		'	'	0.45 0.17	$\operatorname{sd}(\mu)/\sigma = 0.5$
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$,	,		'	
BIC 0.00 0.00 0.00 0.00 0.00 0.00 0.05 0.01 $s_{Oracle} = 100.0$ CV.1se 0.03 0.01 0.00 0.00 0.00 0.00 0.63 0.27 0.12 0.01 CV.min 0.47 0.17 0.17 0.03 0.05 0.01 0.75 0.47 0.47 0.16 $sd(\mu)/\sigma = 0.5$,	,			
			,	'			$\bar{s}_{Oracle} = 100.0$
CV.min $0.47 \mid 0.17 \mid 0.03 0.05 \mid 0.01 0.75 \mid 0.47 0.47 \mid 0.16 sd(\mu)/\sigma = 0.5$						0.12 0.01	
			,	,			$\operatorname{sd}(\mu)/\sigma = 0.5$
r viv				,		1	
AIC 0.90 0.91 0.90 0.89 0.90 0.90 0.85 0.74		'		,			
BIC 0.01 0.00 0.00 0.00 0.00 0.00 0.00 0.01 $\bar{s}_{Oracle} = 100.0$,			$s_{Oracle} = 100.0$

Table 135: FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 10.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.33 0.26	0.20 0.24	0.02 0.20	0.22 0.22	0.00 0.19	
CV.min	0.67 0.33	0.59 0.31	0.20 0.24	0.51 0.26	0.19 0.24	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.65 \mid 0.33$	$0.56 \mid 0.30$	$0.09 \mid 0.22$	$0.48 \mid 0.26$		$\rho = 0$
AIC	$0.88 \mid 0.72$	$0.88 \mid 0.72$	$0.88 \mid 0.69$	0.49 0.26		$\bar{s}_{Oracle} = 100.0$
BIC	0.21 0.23	0.11 0.22	0.00 0.18	0.17 0.21		SOracle = 100.0
CV.1se	0.68 0.27	0.57 0.24	0.16 0.18	0.47 0.18	0.04 0.18	
CV.min	0.79 0.36	0.75 0.32	0.49 0.24	0.56 0.20	0.23 0.21	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.77 0.34	$0.72 \mid 0.30$	0.41 0.23	0.56 0.20		$\rho = 0.5$
AIC	$0.88 \mid 0.66$	$0.88 \mid 0.66$	$0.87 \mid 0.65$	0.56 0.20		ā - · - 100 0
BIC	0.46 0.20	0.34 0.19	0.04 0.16	0.46 0.18		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.81 0.28	0.79 0.25	0.68 0.18	0.03 0.11	0.45 0.16	
CV.min	0.83 0.37	0.82 0.34	0.75 0.24	0.06 0.12	0.61 0.20	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.82 0.33	0.81 0.30	0.72 0.22	0.06 0.12		$\rho = 0.9$
AIC	0.84 0.39	0.84 0.39	0.81 0.35	0.06 0.12		- 100 O
BIC	0.74 0.17	0.72 0.15	0.45 0.10	0.05 0.12		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.25 0.17	0.12 0.15	0.01 0.12	0.43 0.19	0.01 0.12	
CV.min	0.66 0.25	0.56 0.22	0.14 0.16	0.75 0.28	0.23 0.17	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.66 0.25	0.52 0.21	0.03 0.13	0.71 0.26	,	$\rho = 0$
AIC	0.89 0.79	0.89 0.79	0.89 0.76	0.79 0.32		100.0
BIC	0.18 0.16	0.07 0.14	0.00 0.10	0.15 0.15		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.61 0.16	0.49 0.14	0.11 0.11	0.70 0.18	0.06 0.11	
CV.min	0.79 0.26	0.75 0.23	0.40 0.15	0.80 0.25	0.30 0.14	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.78 0.25	0.73 0.21	0.28 0.14	0.79 0.24	,	$\rho = 0.5$
AIC	0.89 0.75	0.89 0.75	0.89 0.72	0.80 0.26		_ 100.0
BIC	0.38 0.12	0.27 0.11	0.02 0.08	0.47 0.12		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.63 0.11	0.74 0.12	0.71 0.10	0.30 0.10	0.57 0.09	
CV.min	0.83 0.24	0.83 0.22	0.77 0.14	0.49 0.13	0.70 0.13	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.84 0.23	0.82 0.19	0.71 0.12	0.49 0.13	1	$\rho = 0.9$
AIC	0.87 0.48	0.87 0.49	0.87 0.47	0.49 0.13		,
BIC	0.08 0.01	0.01 0.01	0.01 0.01	0.32 0.10		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.11 0.07	0.05 0.06	0.01 0.05	0.57 0.15	0.01 0.05	
CV.min	0.64 0.16	0.50 0.13	0.12 0.08	0.81 0.26	0.34 0.11	$sd(\mu)/\sigma = 0.5$
AICc	0.67 0.17	0.40 0.12	0.00 0.04	0.78 0.22	'	$\rho = 0$
AIC	0.90 0.85	0.90 0.84	0.90 0.83	0.87 0.41		,
BIC	0.12 0.08	0.03 0.06	0.00 0.02	0.15 0.08		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.14 0.02	0.17 0.03	0.06 0.03	0.73 0.11	0.09 0.04	
CV.min	0.74 0.12	0.71 0.11	0.33 0.06	0.84 0.22	0.41 0.07	$sd(\mu)/\sigma = 0.5$
AICc	0.77 0.14	0.65 0.10	0.04 0.02	0.83 0.19	1	$\rho = 0.5$
AIC	0.90 0.83	0.90 0.82	0.90 0.80	0.87 0.33		
BIC	0.09 0.02	0.04 0.02	0.00 0.01	0.16 0.02		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.00 0.01	0.00 0.01	0.00 0.01	0.41 0.05	0.01 0.01	
CV.min	0.52 0.02	0.41 0.01	0.14 0.01	0.75 0.14	0.32 0.03	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.64 0.03	0.18 0.01	0.00 0.01	0.74 0.14	0.02 0.03	$\rho = 0.9$
AIC	0.88 0.58	0.89 0.60	0.89 0.57	0.76 0.15		
BIC	0.08 0.01	0.01 0.01	0.00 0.01	0.12 0.02		$\bar{s}_{Oracle} = 100.0$
	0.00 0.01	0.01 0.01	0.00 0.01	0.12 0.02		

Table 136: FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 50.

	lasso	$\operatorname{GL} \gamma = 1$	$\mathrm{GL}\;\gamma=10$	marginal AL	sparsenet MCP	
CV.1se	0.51 0.86	0.36 0.82	0.07 0.69	0.44 0.77	0.11 0.72	
CV.min	0.67 0.91	$0.57 \mid 0.89$	$0.19 \mid 0.78$	$0.59 \mid 0.83$	0.36 0.84	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 0.89	$0.49 \mid 0.87$	$0.23 \mid 0.78$	$0.55 \mid 0.81$		$\rho = 0$
AIC	$0.87 \mid 0.97$	$0.87 \mid 0.96$	$0.87 \mid 0.94$	$0.64 \mid 0.85$		$\bar{s}_{Oracle} = 100.0$
BIC	0.24 0.72	0.12 0.68	0.01 0.54	$0.24 \mid 0.66$		SOracle = 100.0
CV.1se	0.70 0.84	0.63 0.80	0.33 0.68	0.67 0.67	0.24 0.67	
CV.min	$0.77 \mid 0.91$	$0.72 \mid 0.89$	$0.48 \mid 0.78$	0.71 0.73	0.42 0.76	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.70 \mid 0.84$	$0.66 \mid 0.83$	$0.47 \mid 0.79$	$0.69 \mid 0.71$		$\rho = 0.5$
AIC	$0.86 \mid 0.97$	$0.86 \mid 0.97$	$0.86 \mid 0.96$	$0.72 \mid 0.74$		- 100 O
BIC	0.32 0.35	0.38 0.50	0.16 0.51	$0.49 \mid 0.44$		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.76 0.82	0.73 0.78	0.61 0.67	0.57 0.20	0.54 0.63	
CV.min	0.79 0.89	0.77 0.88	0.66 0.77	0.61 0.24	0.60 0.70	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.75 0.80	0.73 0.79	0.64 0.74	0.61 0.24	•	$\rho = 0.9$
AIC	0.79 0.89	0.78 0.90	0.76 0.91	0.61 0.24		100.0
BIC	0.06 0.01	0.01 0.01	0.02 0.03	0.48 0.17		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.41 0.53	0.26 0.45	0.07 0.30	0.50 0.56	0.24 0.44	
CV.min	0.64 0.67	0.52 0.60	0.18 0.41	0.66 0.67	0.54 0.62	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.58 0.63	0.49 0.59	0.28 0.46	0.60 0.63	'	$\rho = 0$
AIC	0.89 0.92	0.89 0.91	0.89 0.89	0.78 0.77		,
BIC	0.08 0.23	0.04 0.22	0.00 0.02	0.17 0.34		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.63 0.39	0.59 0.39	0.33 0.26	0.70 0.44	0.36 0.34	
CV.min	0.75 0.61	0.71 0.57	0.47 0.39	0.76 0.55	0.53 0.45	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.71 0.53	0.68 0.52	0.57 0.51	0.74 0.51	'	$\rho = 0.5$
AIC	0.89 0.93	0.89 0.93	0.89 0.90	0.81 0.70		,
BIC	0.01 0.01	0.00 0.01	0.00 0.00	0.09 0.04		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.07 0.04	0.22 0.12	0.22 0.11	0.64 0.16	0.63 0.28	
CV.min	0.61 0.23	0.64 0.35	0.48 0.26	0.72 0.25	0.71 0.40	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.67 0.17	0.35 0.15	0.26 0.18	0.72 0.25		$\rho = 0.9$
AIC	0.85 0.83	0.85 0.83	0.84 0.80	0.72 0.26		,
BIC	0.06 0.01	0.01 0.01	0.00 0.01	0.12 0.02		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.08 0.03	0.03 0.01	0.00 0.00	0.60 0.29	0.07 0.03	
CV.min	0.56 0.26	0.33 0.14	0.07 0.03	0.75 0.44	0.55 0.25	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.59 0.27	0.28 0.13	0.00 0.00	0.71 0.38		$\rho = 0$
AIC	0.90 0.90	0.90 0.89	0.90 0.89	0.85 0.67		,
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.05 0.02		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.65 0.11	0.16 0.00	
CV.min	0.42 0.04	0.30 0.03	0.10 0.01	0.81 0.28	0.45 0.04	$sd(\mu)/\sigma = 0.5$
AICc	0.59 0.08	0.10 0.01	0.00 0.00	0.79 0.23	0.15 0.01	$\rho = 0.5$
AIC	0.90 0.91	0.90 0.90	0.90 0.89	0.87 0.63		
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.08 0.01		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.13 0.01	0.00 0.00	
CV.rise CV.min	0.52 0.02	0.40 0.02	0.10 0.01	0.77 0.11	0.16 0.01	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.62 0.02	0.40 0.02	0.00 0.01	0.77 0.11	0.10 0.01	$\rho = 0.9$
AIC	0.89 0.80	0.88 0.78	0.89 0.75	0.79 0.12		
BIC	0.05 0.00	0.01 0.01	0.00 0.01	0.00 0.20		$\bar{s}_{Oracle} = 100.0$
DIC	0.05 0.01	0.01 0.01	0.00 0.01	0.09 0.01		

Table 137: FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 100.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.54 0.98	0.38 0.98	0.08 0.93	0.46 0.94	0.07 0.93	
CV.min	$0.68 \mid 0.99$	$0.56 \mid 0.99$	$0.17 \mid 0.97$	$0.58 \mid 0.96$	0.23 0.97	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 0.99	$0.47 \mid 0.99$	$0.10 \mid 0.94$	$0.54 \mid 0.95$		$\rho = 0$
AIC	0.87 1.00	$0.87 \mid 0.99$	$0.87 \mid 0.98$	$0.67 \mid 0.97$		$\bar{s}_{Oracle} = 100.0$
BIC	0.31 0.93	0.17 0.93	$0.03 \mid 0.85$	$0.29 \mid 0.88$		SOracle = 100.0
CV.1se	0.72 0.98	0.65 0.98	0.36 0.96	0.68 0.84	0.28 0.96	
CV.min	0.78 1.00	0.72 0.99	$0.48 \mid 0.99$	$0.72 \mid 0.90$	$0.41 \mid 0.98$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	$0.70 \mid 0.98$	$0.65 \mid 0.98$	$0.38 \mid 0.97$	$0.70 \mid 0.87$		$\rho = 0.5$
AIC	0.87 1.00	0.87 1.00	0.86 1.00	$0.74 \mid 0.91$		$\bar{s}_{Oracle} = 100.0$
BIC	0.01 0.01	0.02 0.04	$0.26 \mid 0.89$	0.10 0.09		<i>SOracle</i> – 100.0
CV.1se	0.76 0.98	0.72 0.97	0.58 0.95	0.63 0.25	0.52 0.94	
CV.min	$0.80 \mid 0.99$	$0.77 \mid 0.99$	$0.63 \mid 0.98$	$0.67 \mid 0.35$	$0.57 \mid 0.97$	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.74 0.96	$0.71 \mid 0.97$	$0.57 \mid 0.96$	$0.66 \mid 0.34$		$\rho = 0.9$
AIC	$0.80 \mid 0.99$	$0.79 \mid 1.00$	$0.77 \mid 1.00$	$0.66 \mid 0.35$		- 100 O
BIC	$0.09 \mid 0.02$	0.03 0.01	$0.01 \mid 0.02$	0.14 0.03		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.43 0.66	0.28 0.55	0.09 0.31	0.51 0.71	0.38 0.64	
CV.min	0.64 0.82	0.51 0.74	0.22 0.49	0.65 0.81	0.62 0.81	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.77	0.48 0.72	0.42 0.64	0.59 0.77		$\rho = 0$
AIC	0.89 0.95	0.89 0.93	0.89 0.90	0.78 0.89		
BIC	0.00 0.02	0.00 0.03	0.00 0.00	0.10 0.27		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.41 0.27	0.42 0.30	0.06 0.05	0.69 0.49	0.43 0.35	
CV.min	0.71 0.67	0.67 0.64	0.25 0.20	0.74 0.64	0.60 0.58	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.68 0.54	0.65 0.60	0.60 0.66	0.72 0.57	·	$\rho = 0.5$
AIC	0.89 0.96	0.88 0.96	0.89 0.93	0.82 0.83		- 100.0
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.05 0.01		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.01 0.01	0.02 0.01	0.00 0.01	0.52 0.11	0.11 0.07	
CV.min	0.55 0.05	0.48 0.09	0.14 0.02	0.73 0.26	0.41 0.21	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.63 0.05	0.17 0.03	0.04 0.04	0.73 0.28	·	$\rho = 0.9$
AIC	0.85 0.93	0.85 0.93	0.84 0.90	0.74 0.36		_ 100.0
BIC	0.07 0.01	0.02 0.01	0.00 0.01	0.08 0.01		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.05 0.01	0.01 0.00	0.00 0.00	0.60 0.30	0.07 0.01	
CV.min	0.51 0.24	0.20 0.07	0.04 0.01	0.74 0.49	0.51 0.24	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.56 0.26	0.18 0.09	0.00 0.00	0.69 0.41	,	$\rho = 0$
AIC	0.90 0.91	0.90 0.89	0.90 0.90	0.85 0.73		
BIC	0.00 0.00	0.00 0.00	0.02 0.02	0.04 0.01		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.62 0.09	0.22 0.00	
CV.min	0.36 0.03	0.21 0.01	0.07 0.00	0.81 0.27	0.45 0.03	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.54 0.06	0.05 0.00	0.00 0.00	0.79 0.21	1	$\rho = 0.5$
AIC	0.90 0.92	0.90 0.90	0.90 0.90	0.87 0.68		
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.07 0.00		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.08 0.01	0.04 0.00	
CV.min	0.51 0.02	0.41 0.02	0.13 0.01	0.78 0.07	0.31 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.63 0.03	0.11 0.01	0.01 0.01	0.79 0.08	1	$\rho = 0.9$
AIC	0.89 0.84	0.89 0.82	0.89 0.80	0.81 0.17		
BIC	0.04 0.01	0.01 0.01	0.00 0.00	0.10 0.01		$\bar{s}_{Oracle} = 100.0$
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2.22 0.01	2.22 0.00	2.22 0.02		

Table 138: FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 200.

	lasso	$\operatorname{GL} \gamma = 1$	$\operatorname{GL} \gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.55 1.00	0.35 1.00	0.06 0.99	0.46 0.98	0.04 0.98	
CV.min	0.68 1.00	0.54 1.00	0.13 1.00	$0.58 \mid 0.99$	0.14 0.99	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.58 1.00	0.44 1.00	$0.03 \mid 0.98$	$0.53 \mid 0.98$		$\rho = 0$
AIC	0.87 1.00	0.87 1.00	$0.87 \mid 0.99$	$0.68 \mid 0.99$		= - 100.0
BIC	0.34 0.98	0.18 0.98	0.02 0.96	0.33 0.95		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.73 1.00	0.64 1.00	0.31 1.00	0.68 0.90	0.11 1.00	
CV.min	0.78 1.00	0.71 1.00	0.38 1.00	0.73 0.94	0.19 1.00	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.71 1.00	0.63 1.00	0.22 1.00	0.70 0.92		$\rho = 0.5$
AIC	0.87 1.00	0.87 1.00	0.87 1.00	0.76 0.95		= 100.0
BIC	0.00 0.01	0.04 0.08	0.20 0.99	0.05 0.03		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.77 1.00	0.72 1.00	0.56 1.00	0.63 0.30	0.46 1.00	
CV.min	0.81 1.00	0.77 1.00	0.60 1.00	0.67 0.47	0.52 1.00	$\operatorname{sd}(\mu)/\sigma = 2$
AICc	0.74 0.99	0.70 1.00	0.51 0.99	0.67 0.46	'	$\rho = 0.9$
AIC	0.81 1.00	0.80 1.00	0.79 1.00	0.67 0.48		1000
BIC	0.14 0.02	0.06 0.02	0.14 0.28	0.13 0.02		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.44 0.72	0.27 0.57	0.09 0.25	0.51 0.77	0.42 0.72	
CV.min	0.64 0.87	0.49 0.79	0.22 0.48	0.64 0.86	0.64 0.87	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.56 0.83	0.48 0.78	0.43 0.67	0.58 0.82	1	$\rho = 0$
AIC	0.89 0.96	0.89 0.94	0.89 0.91	0.78 0.93		,
BIC	0.00 0.01	0.00 0.00	0.00 0.00	0.05 0.14		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.24 0.14	0.22 0.15	0.01 0.01	0.68 0.49	0.28 0.18	
CV.min	0.65 0.60	0.56 0.53	0.10 0.04	0.74 0.66	0.61 0.57	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.63 0.46	0.61 0.62	0.60 0.73	0.71 0.59	0.00 0.00	$\rho = 0.5$
AIC	0.88 0.97	0.88 0.97	0.89 0.94	0.82 0.88		· '
BIC	0.01 0.00	0.00 0.00	0.00 0.00	0.05 0.01		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.01 0.01	0.01 0.01	0.01 0.01	0.32 0.06	0.02 0.01	
CV.min	0.57 0.05	0.50 0.04	0.16 0.02	0.73 0.24	0.29 0.05	$\operatorname{sd}(\mu)/\sigma = 1$
AICc	0.64 0.05	0.20 0.02	0.04 0.04	0.73 0.26	0.25 0.05	$\rho = 0.9$
AIC	0.85 0.96	0.85 0.96	0.85 0.94	0.75 0.47		,
BIC	0.11 0.02	0.04 0.01	0.01 0.01	0.14 0.02		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.04 0.01	0.01 0.00	0.00 0.00	0.60 0.31	0.07 0.01	
CV.rise CV.min	0.48 0.22	0.15 0.04	0.04 0.01	0.73 0.50	0.49 0.22	$\operatorname{sd}(\mu)/\sigma = 0.5$
AICc	0.54 0.25	0.13 0.07	0.00 0.00	0.69 0.42	0.15 0.22	$\rho = 0$
AIC	0.90 0.91	0.90 0.89	0.90 0.90	0.85 0.75		,
BIC	0.00 0.00	0.00 0.00	0.18 0.17	0.04 0.01		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.00 0.00	0.00 0.00	0.00 0.00	0.60 0.08	0.24 0.00	
CV.13C	0.34 0.03	0.18 0.01	0.00 0.00	0.81 0.26	0.45 0.03	$sd(\mu)/\sigma = 0.5$
AICc	0.53 0.06	0.03 0.00	$0.00 \mid 0.00$	0.79 0.21	0.43 0.03	$\rho = 0.5$
AIC	0.90 0.92	0.90 0.90	0.90 0.90	0.86 0.69		ĺ ,
BIC	0.02 0.00	0.00 0.00	0.00 0.00	0.07 0.00		$\bar{s}_{Oracle} = 100.0$
CV.1se	0.02 0.00	0.00 0.00	0.00 0.00	0.09 0.01	0.08 0.00	
CV.1se CV.min	0.00 0.00	0.38 0.01	0.00 0.00	0.09 0.01	0.39 0.02	$sd(\mu)/\sigma = 0.5$
AICc	0.49 0.02	0.38 0.01	0.14 0.01	0.79 0.00	0.37 0.02	$\rho = 0.9$
AICC	0.82 0.03	'	0.01 0.00	0.79 0.07		,
		0.89 0.83	'			$\bar{s}_{Oracle} = 100.0$
BIC	0.04 0.01	0.01 0.00	0.00 0.00	0.11 0.01		