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 $\hat{\boldsymbol{\beta}}$, the Newton-Raphson update for maximum likelihood estimation is $\boldsymbol{\beta} = \hat{\boldsymbol{\beta}} - \mathbf{H}^{-1}\mathbf{g}$, where $\mathbf{H}$ is the information matrix with elements $h_{jk} = \partial^2 l/\partial\beta_j\partial\beta_k|_{\hat{\boldsymbol{\beta}}}$ 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 $\boldsymbol{\beta} = (\mathbf{X}'\mathbf{V}\mathbf{X})^{-1}\mathbf{X}'\mathbf{V}\mathbf{z}$, such that the Newton update solves a weighted-least-squares problem. Adding ℓ_1 costs, the minimization objective from (3) becomes

$$\underset{\alpha,\beta_1\dots\beta_p\in\mathbb{R}}{\mathrm{argmin}} \sum_i \frac{v_i}{2}(\alpha + \mathbf{x}_i'\boldsymbol{\beta} - z_i)^2 + n\sum_j \omega_j\lambda|\beta_j|. \tag{21}$$

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 $\texttt{vh}_\texttt{j} = \sum_i v_i(x_{ij} - \bar{x}_j)^2$ and $\texttt{vx}_\texttt{j} = \sum_i v_i x_{ij}$ for $j = 1 \ldots p$.

while $\max\limits_{j=1\ldots p} \texttt{vh}_\texttt{j}\Delta_j^2 > \texttt{thresh}$:

  for j=1...p:

    set $\texttt{vg}_\texttt{j} = -\sum_i x_{ij} v_i(z_i - \hat{\eta}_i)$ and $\texttt{ghb} = \texttt{vg}_\texttt{j} - \texttt{vh}_\texttt{j}\hat{\beta}_j$

    if $|\texttt{ghb}| < n\lambda^t\omega_j^t$: $\Delta_j = -\hat{\beta}_j$

    else: $\Delta_j = -(\texttt{vg}_\texttt{j} - \text{sign}(\texttt{ghb})n\lambda^t\omega_j^t)/\texttt{vh}_\texttt{j}$.

    update $\hat{\beta}_j \stackrel{+}{=} \Delta_j$, $\hat{\alpha} \stackrel{+}{=} -\texttt{vx}_\texttt{j}\Delta_j$, 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 $\boldsymbol{\theta} = [\alpha, \boldsymbol{\beta}]$, 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 $\partial M/\partial\hat{\theta}_l \approx \mathrm{v}_l/\mathrm{u}_l$. An approximate Newton-Raphson step to solve for the root of $\hat{\boldsymbol{\theta}} - M(\hat{\boldsymbol{\theta}})$ updates each coordinate $\hat{\theta}_l \leftarrow \hat{\theta}_l^{(-1)} - (\hat{\theta}_l^{(-1)} - \hat{\theta}_l^{(0)})/(1 - \mathrm{v}_l/\mathrm{u}_l)$ which can be re-written as $\hat{\theta}_l = (1 - \mathrm{w}_l)\hat{\theta}_l^{(-1)} + \mathrm{w}_l\hat{\theta}_l^{(0)}$ where $\mathrm{w}_l = \mathrm{u}_l/(\mathrm{u}_l - \mathrm{v}_l)$.

8 Gradient, curvature, and path starts

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

For ℓ_1 costs $c_j(|\beta_j|) = |\beta_j|$, the infimum λ such that $\hat{\boldsymbol{\beta}} = \mathbf{0}$ is available analytically as $\lambda^1 = n^{-1} \max\{|g_j(\mathbf{0})|,\ j = 1 \ldots p\}$, the maximum mean absolute gradient for the null model with $\hat{\boldsymbol{\beta}} = \mathbf{0}$. 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 $\{j : \hat{\beta}_j \neq 0\} = \{j : \beta_j \neq 0\}$ for some 'true' $\boldsymbol{\beta}$. For standard lasso estimated $\hat{\boldsymbol{\beta}}$, 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* $(\theta, S, \mathbf{v})$*-irrepresentable condition for* $\theta \in [0,1]$ *and* $\mathbf{v} \in \mathbb{R}^s$ *holds that,*

$$|\boldsymbol{x}_j' \mathbf{X}_S (\mathbf{X}_S' \mathbf{X}_S)^{-1} \mathbf{v}| \leq \theta \ \ \forall\, j \notin S \tag{22}$$

This is often presented with $\mathbf{v} = \mathbf{1}$.[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 $\hat{\boldsymbol{\beta}}$ from weighted-ℓ_1 penalized estimation, and $S = \{j : \beta_j^\nu \neq 0\}$ for $\boldsymbol{\beta}^\nu$ 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 $\beta_j^\nu = 0$.

[1] Wainwright (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*

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

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 $|\boldsymbol{x}_j'\mathbf{X}_S(\mathbf{X}_S'\mathbf{X}_S)^{-1}\boldsymbol{\omega}_S| \leq \frac{\|\boldsymbol{\omega}_S\|}{\sqrt{s}}\theta_{\text{adap}}(S)$ where $\theta_{\text{adap}}(S)$ is their 'adaptive restricted regression' coefficient. Of interest here, they show that $\theta_{\text{adap}}(S) \leq \sqrt{s}/\Lambda_{\min}(S)$ 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 $n\lambda\omega_j = |\boldsymbol{x}_j'(\mathbf{X}\hat{\boldsymbol{\beta}} - \mathbf{y})| \leq |\boldsymbol{x}_j'\mathbf{X}(\hat{\boldsymbol{\beta}} - \boldsymbol{\beta}^\nu)| + |\boldsymbol{x}_j'\mathbf{e}^S| \leq n\left(2\|\boldsymbol{\omega}_S\|/\phi(L,S) + \sqrt{2\nu}/\lambda\right)$ $\forall\, j$. Dividing by $n\lambda\omega_j$ and counting yields

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

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*

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

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* $\text{sgn}(\hat{\boldsymbol{\beta}}) = \text{sgn}(\boldsymbol{\beta}^\nu)$.

Proof. The Karush-Kuhn-Tucker (KKT) conditions at weighted-ℓ_1 minimization convergence imply that

$$\mathbf{x}_j'\mathbf{X}(\hat{\boldsymbol{\beta}} - \boldsymbol{\beta}^\nu) + \mathbf{x}_j'\mathbf{e}^S = -n\lambda\zeta_j \;\text{ for }\; j = 1\ldots p \tag{26}$$

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), $\hat{S} \cap S^c = \varnothing$ occurs if and only if these KKT conditions hold for projections restricted to S,

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

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

$$\boldsymbol{x}_j'\mathbf{X}_S(\hat{\boldsymbol{\beta}}_S - \boldsymbol{\beta}_S^\nu) - \boldsymbol{x}_j'\mathbf{e}^S \leq n\lambda\zeta_j \;\;\Leftarrow\;\; 1 - \frac{|x_j'\mathbf{e}^S|}{n} \geq 1 - \frac{\sqrt{2\nu}}{\lambda\omega_j} \geq |\boldsymbol{x}_j'\mathbf{X}_S(\mathbf{X}_S'\mathbf{X}_S)^{-1}\boldsymbol{\omega}_S|. \tag{28}$$

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 $\boldsymbol{\beta^\nu}_S = (\mathbf{X}_S'\mathbf{X}_S)^{-1}\mathbf{X}_S'\mathbf{y}$ and $\boldsymbol{\beta^\nu}_S - \hat{\boldsymbol{\beta}}_S = n\lambda(\mathbf{X}_S'\mathbf{X}_S)^{-1}\boldsymbol{\zeta}_S$. □

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

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

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

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

where $\tilde{\beta}_j = \boldsymbol{x}_j'\mathbf{e}^S/(\boldsymbol{x}_j'\boldsymbol{x}_j)$ is the stagewise coefficient estimate. Since $\mathrm{var}(\boldsymbol{x}_j) = 1$, multiplying everything by $\mathrm{var}(\mathbf{e}^S)$ yields $\mathrm{cov}^2(\boldsymbol{x}_j, \mathbf{e}^S) = \mathrm{var}(\mathbf{e}^S) - \mathrm{var}(\mathbf{e}^S - \tilde{\beta}_j\boldsymbol{x}_j) \leq \mathrm{var}(\mathbf{e}^S) - \mathrm{var}(\mathbf{e}^{S\cup j})$. 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 $\mathrm{var}(\mathbf{e}^S) = \mathrm{MSE}_S$, etc, we are done. □

10.2 Bayesian MAP

PROPOSITION 10.1. $\hat{\boldsymbol{\beta}}$ *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 $[\hat{\boldsymbol{\beta}}, \hat{\boldsymbol{\tau}}]$ 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 $\boldsymbol{\tau}$ 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 $\pi(\beta_j) = 0.5s\,(1+\gamma|\beta_j|)^{-(s+1)}$. 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 $\boldsymbol{\beta}$ under $\mathrm{Ga}(s-1, 1/\gamma)$ 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 $\lambda\gamma^2$.[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 $\mathrm{var}(\tau_j) < n/4$, 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 $\|\hat{\mathbf{y}}(\mathbf{y}_1) - \hat{\mathbf{y}}(\mathbf{y}_2)| \le L\|\mathbf{y}_1 - \mathbf{y}_2\|$ 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

[2] 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.

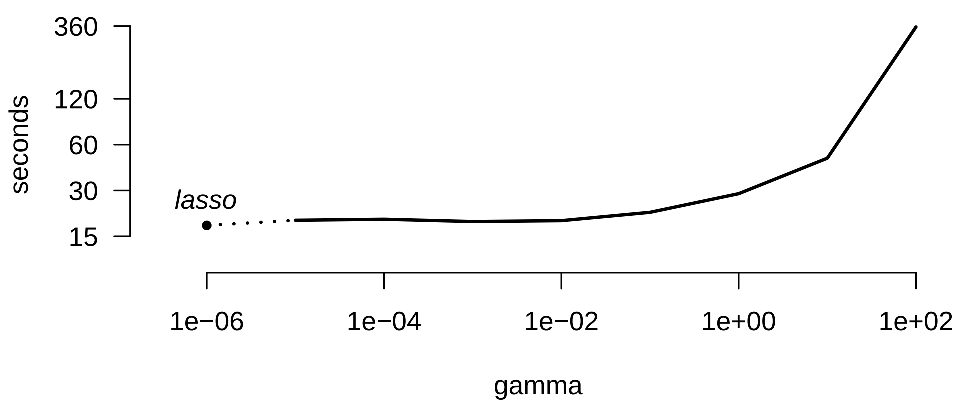

Figure 4: Timings for the hockey data path fits of Section 6 on a length-100 grid with $\lambda^{100} = 0.01\lambda^1$.

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

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

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 $[\boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}}]$, functions of random sample $\mathbf{y} \sim g$, then $Q(\boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}})$ 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 $\boldsymbol{\eta}_{\mathbf{y}}, \phi_{\mathbf{y}}$ are calculated, and $\tilde{\mathbf{y}}$ for validation.

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

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

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

Consider a Gaussian regression model where $\boldsymbol{\eta}_{\mathbf{y}}$ is an estimate for $\boldsymbol{\eta} = \mathbb{E}\mathbf{y}$ using df degrees of freedom, and set $\phi_{\mathbf{y}} = \sigma^2_{\mathbf{y}} = \sum_i (y_i - \eta_{\mathbf{y}i})^2/n$. 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

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

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 $n\sigma^2_{\mathbf{y}} + 2\sigma^2 df$ 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

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

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

[3]Not 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

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

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

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

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 $\mathbf{z}_i \sim \mathrm{N}(\mathbf{0}, \boldsymbol{\Sigma})$ for $i = 1\dots n$, the regression inputs $\mathbf{x}_i$ are generated as either *continuous* $x_{ij} = z_{ij}$ or *binary* $x_{ij} \overset{ind}{\sim} \mathrm{Bern}\left(1/(1+e^{-z_{ij}})\right)$.

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.

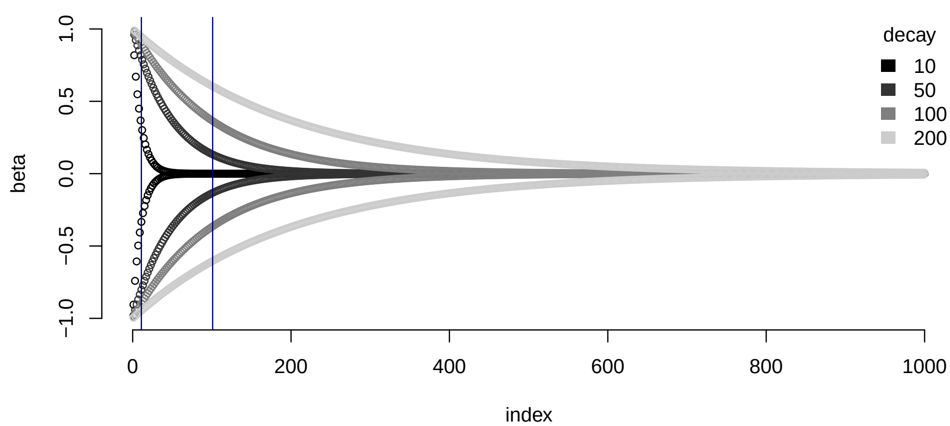

Figure 5: The linear model coefficients for our simulation in 36. Vertical lines mark thresholding points for the *sparse* model simulations, at $J = 10$ for $n = 100$ and at $J = 100$ for $n = 1000$.

References

Armagan, A., D. B. Dunson, and J. Lee (2013). Generalized Double Pareto Shrinkage. *Statistica Sinica 23*, 119–143.

Buhlmann, P. and S. van de Geer (2011). *Statistics for High-Dimensional Data*. Springer.

Efron, B., T. Hastie, I. Johnstone, and R. Tibshirani (2004). Least Angle Regression. *Annals of Statistics 32*, 407–499.

Fan, J. and R. Li (2001). Variable Selection via Nonconcave Penalized Likelihood and its Oracle Properties. *Journal of the American Statistical Association 96*, 1348–1360.

Fan, J., L. Xue, and H. Zou (2014). Strong oracle optimality of folded concave penalized estimation. *The Annals of Statistics 42*(3), 819–849.

Friedman, J., T. Hastie, H. Hofling, and R. Tibshirani (2007). Pathwise coordinate optimization. *The Annals of Applied Statistics 1*, 302–332.

Friedman, J., T. Hastie, and R. Tibshirani (2010). Regularization paths for generalized linear models via coordinate descent. *Journal of Statistical Software 33*, 1–22.

Goldberger, A. S. (1961). Stepwise Least Squares: Residual analysis and specification error. *Journal of the American Statistical Association 56*, 998.

Green, P. J. (1984). Iteratively Reweighted Least Squares for Maximum Likelihood Estimation, and some Robust and Resistant Alternatives. *Journal of the Royal Statistical Society, Series B 46*, 149–192.

Kass, R. E. and A. E. Raftery (1995). Bayes factors. *Journal of the American Statistical Association 90*, 773–795.

Lange, K. (2010). *Numerical Analysis for Statisticians* (2nd ed.). Springer.

Lee, J., Y. Sun, and M. Saunders (2014). Proximal newton-type methods for minimizing convex objective functions in composite form. *SIAM Journal on Optimization 24*, 1420–1443.

Luenberger, D. G. and Y. Ye (2008). *Linear and Nonlinear Programming* (3rd ed.). Springer.

Mallows, C. L. (1973). Some comments on CP. *Technometrics 15*, 661–675.

Schwarz, G. (1978). Estimating the dimension of a model. *The Annals of Statistics 6*, 461–464.

Tseng, P. (2001). Convergence of a block coordinate descent method for nondifferentiable minimization. *Journal of Optimization Theory and Applications 109*, 475–494.

Wainwright, M. J. (2006). Sharp thresholds for high-dimensional and noisy recovery of sparsity. *UC Berkeley Technical Report*.

Wainwright, M. J. (2009). Sharp thresholds for high-dimensional and noisy sparsity recovery using L1-constrained quadratic programming (Lasso). *IEEE Transactions on Information Theory 55*, 2183–2202.

Wu, T. T. and K. Lange (2008). Coordinate descent algorithms for lasso penalized regression. *The Annals of Applied Statistics 2*, 1–21.

Zhou, S. (2009). Thresholding procedures for high-dimensional variable selection and statistical estimation. *Advances in Neural Information Processing Systems 22*.

Zhou, S., S. van de Geer, and P. Bühlmann (2009). Adaptive lasso for high dimensional regression and Gaussian graphical modeling. *arXiv:0903.2515*.

Zou, H. (2006). The adaptive lasso and its oracle properties. *Journal of the American Statistical Association 101*, 1418–1429.

Zou, H., T. Hastie, and R. Tibshirani (2007). On the degrees of freedom of the lasso. *The Annals of Statistics 35*, 2173–2192.

Zou, H. and R. Li (2008). One-step sparse estimates in nonconcave penalized likelihood models. *The Annals of Statistics 36*, 1509–1533.

Detailed simulation results

Table 3 is a summary of estimation error across various configurations of our simulation model, analogous to the predictive RMSE table in the main draft. This is followed by detailed tabulation of prediction MSE (Tables 4-35), estimation MSE (36-67), estimated model dimension (68-99), and sensitivity/FDR across (100-131) all simulation models and selection methods.

Table 3: Summary of estimation RMSE against the true coefficients, averaged over 1000 samples from our simulation model under different designs and ρ. The Oracle is MLE fit either on C_p-optimal support for the dense model or on the true sparse support. The best results are bolded.

	$\frac{\mathrm{sd}(\boldsymbol{\eta})}{\sigma}$	**RMSE** lasso *AICc*	lasso *CV*	GL $\gamma=1$ *AICc*	GL $\gamma=1$ *CV*	GL $\gamma=10$ *AICc*	GL $\gamma=10$ *CV*	adapt. lasso *AICc*	adapt. lasso *CV*	MCP	*Oracle*
dense model, fast decay											
	2	0.012	0.001	0.005	**0**	0.001	**0**	1.16	1.156	**0**	*0.00*
n=1000	*1*	0.054	0.053	0.053	0.052	0.058	0.053	2.189	2.193	**0.05**	*0.00*
	0.5	**0.071**	**0.071**	0.072	**0.071**	0.087	0.072	4.245	4.286	**0.071**	*0.05*
	2	**0.073**	**0.073**	0.084	0.074	0.115	0.074	1.581	1.359	0.075	*0.06*
n=100	*1*	**0.076**	0.077	0.103	0.077	0.17	0.077	2.485	2.619	0.079	*0.08*
	0.5	0.09	0.087	0.174	0.084	0.26	**0.082**	4.473	5.165	0.09	*0.09*
dense model, slow decay											
	2	0.184	**0.154**	0.172	0.157	0.165	0.183	3.23	3.136	0.155	*0.07*
n=1000	*1*	0.239	**0.234**	0.241	0.244	0.287	0.263	5.646	5.621	**0.234**	*0.15*
	0.5	**0.267**	0.268	0.294	0.271	0.29	0.271	10.312	10.419	0.268	*0.23*
	2	**0.27**	0.272	0.331	0.272	0.383	0.272	3.998	3.281	0.273	*3.13*
n=100	*1*	**0.272**	0.274	0.384	0.274	0.452	0.273	6.009	6.27	0.276	*0.45*
	0.5	0.278	0.279	0.556	**0.277**	0.656	**0.277**	10.65	12.305	0.282	*0.32*
sparse model, fast decay											
	2	0.007	**0**	0.002	**0**	**0**	**0**	1.142	1.14	**0**	*0.00*
n=1000	*1*	0.053	0.052	0.052	0.051	0.057	0.052	2.172	2.177	**0.05**	*0.00*
	0.5	**0.071**	**0.071**	0.072	**0.071**	0.087	0.072	4.23	4.272	**0.071**	*0.05*
	2	0.027	0.024	**0.021**	0.023	0.027	0.037	0.941	0.901	0.023	*0.00*
n=100	*1*	**0.05**	**0.05**	0.052	**0.05**	0.103	0.051	1.668	1.786	**0.05**	*0.00*
	0.5	**0.053**	0.054	0.094	0.055	0.172	0.054	3.095	3.575	0.056	*0.01*
sparse model, slow decay											
	2	0.099	0.092	0.072	0.054	0.013	0.004	2.42	2.404	**0.003**	*0.00*
n=1000	*1*	0.177	0.173	0.172	0.173	0.198	0.197	4.645	4.643	**0.17**	*0.05*
	0.5	**0.221**	**0.221**	0.236	0.224	0.243	0.224	8.711	8.799	**0.221**	*0.14*
	2	0.065	0.056	**0.045**	0.051	0.059	0.079	1.191	1.136	0.051	*0.00*
n=100	*1*	**0.1**	**0.1**	0.104	**0.1**	0.139	**0.1**	2.109	2.251	**0.1**	*0.00*
	0.5	**0.1**	0.101	0.156	0.102	0.223	0.102	3.882	4.486	0.103	*0.03*

Table 4: **Prediction MSE for n=1000, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.28	0.27	**0.26**	0.27			0.26	$\rho = 0.9$
AIC	0.35	0.35	0.37	0.27				$Oracle$: 0.25
BIC	0.30	0.29	0.27	0.28				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.26	1.25	1.27	1.27			1.26	$\rho = 0$
AIC	1.85	1.87	2.00	1.31				$Oracle$: 1.17
BIC	1.35	1.31	1.28	1.27				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.14	1.12	1.13	1.13			1.13	$\rho = 0.5$
AIC	1.65	1.67	1.78	1.18				$Oracle$: 1.05
BIC	1.22	1.18	1.15	1.14				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.08	1.06	1.07	1.08			1.07	$\rho = 0.9$
AIC	1.55	1.57	1.68	1.11				$Oracle$: 0.99
BIC	1.16	1.12	1.09	1.09				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.92	**4.89**	5.17	5.08			4.97	$\rho = 0$
AIC	7.90	8.06	8.55	6.07				$Oracle$: 4.66
BIC	5.13	5.09	5.21	4.95				
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**		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.41	4.38	4.62	4.55			4.47	$\rho = 0.5$
AIC	7.06	7.19	7.62	5.44				$Oracle$: 4.16
BIC	4.62	4.57	4.64	4.46				
CV.1se	4.43	4.38	4.33	4.17	4.28			
CV.min	4.18	4.15	4.16	4.40	**4.14**	**4.15**		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.18	4.15	4.38	4.31			4.23	$\rho = 0.9$
AIC	6.66	6.78	7.20	5.08				$Oracle$: 3.93
BIC	4.39	4.34	4.41	4.23				

Table 5: **Prediction MSE for n=1000, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	2.22	2.18	2.18	2.15	2.10			
CV.min	2.07	2.03	2.05	2.07	**2.01**	2.04		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	2.14	2.06	2.04	2.09			2.04	$\rho = 0$
AIC	2.52	2.56	2.73	2.07				$Oracle$: 1.77
BIC	2.82	2.60	2.38	2.47				
CV.1se	1.99	1.96	1.95	1.95	1.88			
CV.min	1.85	1.82	1.83	1.87	**1.79**	**1.82**		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.93	1.85	1.82	1.89			**1.82**	$\rho = 0.5$
AIC	2.25	2.28	2.43	1.87				$Oracle$: 1.57
BIC	2.63	2.38	2.13	2.27				
CV.1se	1.87	1.84	1.83	1.85	1.77			
CV.min	1.75	1.71	1.72	1.77	**1.69**	1.72		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.82	1.75	1.71	1.79			**1.71**	$\rho = 0.9$
AIC	2.11	2.14	2.28	1.77				$Oracle$: 1.48
BIC	2.50	2.27	2.00	2.16				
CV.1se	8.48	8.43	8.71	7.83	8.19			
CV.min	7.81	7.79	8.13	7.85	7.79	7.81		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	7.91	**7.76**	8.54	7.80			8.32	$\rho = 0$
AIC	10.67	10.91	11.60	8.52				$Oracle$: 6.88
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.72	**6.56**	7.11	6.64			7.05	$\rho = 0.9$
AIC	8.92	9.11	9.68	7.18				$Oracle$: 5.75
BIC	9.29	8.44	9.08	7.77				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**28.81**	29.04	32.33	29.50			29.02	$\rho = 0$
AIC	44.19	45.58	47.69	36.58				$Oracle$: 26.71
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**24.32**	24.42	27.06	24.91			24.43	$\rho = 0.9$
AIC	36.90	38.04	39.80	30.65				$Oracle$: 22.33
BIC	25.60	25.59	25.63	25.45				

Table 6: **Prediction MSE for n=1000, binary design, dense covariates, and decay 100**.

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

Table 7: **Prediction MSE for n=1000, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	11.14	11.67	14.02	11.52	10.67			
CV.min	10.01	10.28	11.57	10.65	**9.96**	10.02		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	12.40	11.26	10.74	11.43			10.74	$\rho = 0$
AIC	10.87	11.12	11.75	10.29				
BIC	31.02	30.70	22.48	28.59				$Oracle$: 8.99
CV.1se	10.11	10.55	13.01	10.54	9.67			
CV.min	8.99	9.22	10.54	9.69	**8.93**	9.00		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	11.39	10.18	9.56	10.45			9.56	$\rho = 0.5$
AIC	9.65	9.86	10.40	9.29				
BIC	27.48	27.38	21.35	26.13				$Oracle$: 7.97
CV.1se	9.46	9.91	12.60	10.08	9.07			
CV.min	8.46	8.67	9.98	9.21	**8.41**	8.47		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	10.75	9.61	9.01	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				$Oracle$: 7.51
CV.1se	42.32	46.60	49.69	37.25	41.22			
CV.min	36.36	40.66	48.78	36.41	**36.32**	36.42		$\mathrm{sd}(\mu)/\sigma = 1$
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				$Oracle$: 32.78
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	35.14	33.13	36.23	33.10			33.62	$\rho = 0.5$
AIC	39.44	40.71	42.68	34.60				
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	31.14		$\mathrm{sd}(\mu)/\sigma = 1$
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				$Oracle$: 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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				$Oracle$: 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	109.19		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				$Oracle$: 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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**102.27**	106.26	106.53	104.36			104.97	$\rho = 0.9$
AIC	150.74	157.29	162.82	129.44				
BIC	103.90	103.92	104.37	103.84				$Oracle$: 99.15

Table 8: **Prediction MSE for n=1000, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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**		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.08	5.02	5.06	5.08			5.05	$\rho = 0$
AIC	7.41	7.50	8.01	5.27				$Oracle$: 4.70
BIC	5.41	5.32	5.32	5.09				
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**		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	2.04	1.99	1.94	2.06			1.94	$\rho = 0.5$
AIC	2.69	2.72	2.89	2.07				$Oracle$: 1.77
BIC	2.34	2.25	2.12	2.23				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58	0.57	0.55	**0.52**			0.57	$\rho = 0.9$
AIC	0.61	0.61	0.65	**0.52**				$Oracle$: 0.48
BIC	0.69	0.68	0.68	0.54				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	19.76	19.76	20.60	20.41			19.76	$\rho = 0$
AIC	31.66	32.29	34.25	24.31				$Oracle$: 18.68
BIC	20.61	20.65	21.70	19.92				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	7.78	7.73	7.97	8.10			7.78	$\rho = 0.5$
AIC	11.66	11.85	12.62	8.89				$Oracle$: 7.04
BIC	8.21	8.20	8.22	8.11				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	2.09	2.09	2.08	2.03			2.08	$\rho = 0.9$
AIC	2.66	2.74	3.05	2.03				$Oracle$: 1.91
BIC	2.10	2.09	2.08	2.07				

Table 9: **Prediction MSE for n=1000, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	31.83	31.40	33.52	31.27			31.50	$\rho = 0$
AIC	42.77	43.75	46.49	34.15				$Oracle$: 27.62
BIC	42.03	40.64	48.29	35.76				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	12.25	11.78	11.53	12.34			11.74	$\rho = 0.5$
AIC	14.53	14.78	15.67	12.45				$Oracle$: 9.45
BIC	16.62	16.65	16.79	16.24				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	2.67	2.67	2.62	2.35			2.56	$\rho = 0.9$
AIC	2.29	2.32	2.52	2.34				$Oracle$: 1.72
BIC	2.84	2.84	2.82	2.79				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**115.83**	118.96	123.27	118.51			115.82	$\rho = 0$
AIC	177.17	182.78	191.21	146.86				$Oracle$: 107.15
BIC	123.05	123.19	123.26	121.93				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**41.56**	42.03	42.18	42.51			41.59	$\rho = 0.5$
AIC	60.25	61.81	64.90	50.74				$Oracle$: 36.65
BIC	42.13	42.15	42.17	42.06				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	7.49	7.51	7.49	7.52			7.48	$\rho = 0.9$
AIC	9.77	10.11	11.15	7.60				$Oracle$: 6.68
BIC	7.53	7.54	7.54	7.48				

Table 10: **Prediction MSE for n=1000, continuous design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	19.75	19.76	20.62	19.85	19.04			
CV.min	18.30	18.24	19.12	18.83	**18.2**	18.27		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	19.91	19.17	18.81	19.30			18.89	$\rho = 0$
AIC	21.09	21.49	22.88	18.63				$Oracle$: 15.73
BIC	46.55	33.24	24.57	27.18				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	8.11	7.40	6.65	8.66			6.65	$\rho = 0.5$
AIC	7.16	7.24	7.62	7.58				$Oracle$: 5.31
BIC	20.78	20.81	17.61	20.27				
CV.1se	1.32	1.28	1.23	2.70	1.26			
CV.min	1.18	1.16	1.15	2.39	1.19	**1.15**		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.51	1.32	1.16	2.40			1.16	$\rho = 0.9$
AIC	1.18	**1.14**	1.15	2.36				$Oracle$: 0.90
BIC	3.33	3.33	3.31	3.28				
CV.1se	75.68	78.22	89.56	69.05	73.29			
CV.min	**67.78**	69.59	80.16	68.33	67.80	67.97		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	70.19	69.24	77.65	68.32			69.41	$\rho = 0$
AIC	87.75	90.22	95.25	73.65				$Oracle$: 59.71
BIC	98.91	98.92	99.42	91.76				
CV.1se	32.61	32.35	33.50	27.99	31.66			
CV.min	27.83	28.32	32.85	26.47	27.79	27.43		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	28.71	27.60	27.00	27.01			27.97	$\rho = 0.5$
AIC	29.61	30.23	31.88	**26.46**				$Oracle$: 20.16
BIC	33.51	33.54	33.58	33.30				
CV.1se	5.69	5.68	5.64	5.37	5.66			
CV.min	5.46	5.44	5.46	4.96	5.37	5.43		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.41	5.49	5.47	4.92			5.42	$\rho = 0.9$
AIC	**4.51**	4.59	5.00	4.75				$Oracle$: 3.43
BIC	5.51	5.51	5.48	5.47				
CV.1se	248.48	248.75	248.83	240.83	248.64			
CV.min	241.25	246.89	248.80	251.00	241.20	241.96		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**239.87**	247.57	248.98	244.78			239.94	$\rho = 0$
AIC	359.81	373.33	388.16	305.32				$Oracle$: 225.74
BIC	248.75	248.83	260.38	248.16				
CV.1se	84.04	84.04	84.04	83.70	84.04			
CV.min	83.75	83.95	84.07	86.35	83.78	83.79		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**83.45**	84.01	84.08	85.29			83.43	$\rho = 0.5$
AIC	120.66	124.51	130.20	103.48				$Oracle$: 76.23
BIC	84.03	84.04	84.04	83.99				
CV.1se	14.33	14.33	14.33	14.29	14.34			
CV.min	14.17	14.16	14.17	14.21	14.15	**14.15**		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**14.13**	14.20	14.25	14.25			14.14	$\rho = 0.9$
AIC	18.82	19.62	21.33	14.53				$Oracle$: 12.97
BIC	14.23	14.25	14.31	14.17				

Table 11: **Prediction MSE for n=1000, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma=1$	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		$\mathrm{sd}(\mu)/\sigma=2$
AICc	49.74	45.58	43.24	45.76			44.27	$\rho=0$
AIC	43.49	44.52	47.03	41.20				$Oracle$: 36.05
BIC	124.28	124.46	72.81	114.38				
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		$\mathrm{sd}(\mu)/\sigma=2$
AICc	26.86	19.33	15.30	22.13			15.30	$\rho=0.5$
AIC	**14.76**	14.97	15.68	16.30				$Oracle$: 12.09
BIC	41.76	41.80	41.06	41.46				
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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	155.35	149.68	176.34	147.26			151.51	$\rho=0$
AIC	178.00	184.00	193.01	154.99				$Oracle$: 131.43
BIC	199.52	199.72	199.19	197.28				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	63.18	65.26	63.30	57.33			63.14	$\rho=0.5$
AIC	59.68	61.25	64.28	**54.73**				$Oracle$: 44.09
BIC	66.99	67.02	67.02	66.86				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	10.65	10.82	10.84	10.27			10.65	$\rho=0.9$
AIC	**9.05**	9.31	10.04	9.44				$Oracle$: 7.22
BIC	10.86	10.87	10.92	10.78				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**488.97**	501.61	499.93	498.68			488.93	$\rho=0$
AIC	725.13	757.08	782.66	623.41				$Oracle$: 476.83
BIC	499.85	499.93	702.82	499.40				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**166.89**	167.74	167.73	170.57			166.89	$\rho=0.5$
AIC	241.13	250.55	260.98	208.44				$Oracle$: 159.94
BIC	167.72	167.73	169.58	167.68				
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**		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**27.39**	27.50	27.54	27.60			27.39	$\rho=0.9$
AIC	36.95	38.80	41.67	28.31				$Oracle$: 26.20
BIC	27.52	27.53	27.55	27.47				

Table 12: **Prediction MSE for n=1000, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.41	4.38	4.62	4.55			4.46	$\rho = 0.5$
AIC	7.06	7.19	7.62	5.44				$Oracle$: 4.44
BIC	4.62	4.57	4.64	4.46				
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**		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				

Table 13: **Prediction MSE for n=1000, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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**		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	2.03	1.95	1.93	1.98			1.93	$\rho = 0$
AIC	2.47	2.50	2.68	1.98				
BIC	2.59	2.38	2.18	2.29				$Oracle$: 1.66
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**		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.83	1.76	1.71	1.79			1.72	$\rho = 0.5$
AIC	2.20	2.23	2.38	1.79				
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**	1.62		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.73	1.66	1.62	1.70			1.62	$\rho = 0.9$
AIC	2.07	2.09	2.23	1.69				
BIC	2.28	2.08	1.84	2.02				$Oracle$: 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		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.92	**6.76**	7.35	6.82			7.26	$\rho = 0.5$
AIC	9.31	9.51	10.10	7.46				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				$Oracle$: 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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**23.85**	23.94	26.63	24.43			**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

Table 14: **Prediction MSE for n=1000, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma=1$	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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	14.24	13.96	15.45	14.00			14.51	$\rho=0$
AIC	18.83	19.34	20.48	15.33				$Oracle$: 11.78
BIC	21.17	19.98	21.18	17.90				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	12.85	**12.52**	13.71	12.65			13.25	$\rho=0.5$
AIC	16.74	17.18	18.16	13.77				$Oracle$: 10.46
BIC	18.86	18.33	18.89	16.72				
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**		$\mathrm{sd}(\mu)/\sigma=1$
AICc	12.15	**11.82**	12.94	11.98			12.53	$\rho=0.9$
AIC	15.75	16.16	17.10	12.95				$Oracle$: 9.86
BIC	17.80	17.37	17.79	16.04				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**51.14**	52.09	55.86	52.29			51.95	$\rho=0$
AIC	77.50	80.32	83.64	65.12				$Oracle$: 47.14
BIC	53.49	53.50	53.52	53.31				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**45.75**	46.41	50.02	46.73			46.29	$\rho=0.5$
AIC	68.81	71.22	74.17	58.32				$Oracle$: 41.82
BIC	47.49	47.49	47.51	47.37				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**43.18**	43.79	46.92	44.14			43.66	$\rho=0.9$
AIC	64.73	67.04	69.87	54.55				$Oracle$: 39.43
BIC	44.79	44.79	44.81	44.69				

Table 15: **Prediction MSE for n=1000, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	4.85	4.51	4.20	4.69			4.20	$\rho = 0.5$
AIC	5.89	6.00	6.43	4.73				$Oracle$: 3.84
BIC	5.94	5.10	4.38	5.31				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	4.59	4.26	3.97	4.46			3.98	$\rho = 0.9$
AIC	5.54	5.65	6.05	4.49				$Oracle$: 3.62
BIC	5.65	4.82	4.15	5.08				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				
CV.1se	65.81	65.86	65.86	64.21	65.85			
CV.min	64.32	65.58	65.89	66.75	64.36	64.49		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				

Table 16: **Prediction MSE for n=1000, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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**		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.15	0.15	0.14	0.17			**0.14**	$\rho = 0.9$
AIC	0.15	0.14	0.14	0.17				$Oracle$: 0.13
BIC	0.20	0.19	0.17	0.17				
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**		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.08	5.02	5.06	5.08			5.05	$\rho = 0$
AIC	7.41	7.50	8.01	5.27				$Oracle$: 4.99
BIC	5.42	5.32	5.32	5.09				
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**		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	2.04	1.99	1.94	2.06			1.94	$\rho = 0.5$
AIC	2.69	2.72	2.89	2.07				$Oracle$: 1.88
BIC	2.34	2.25	2.12	2.23				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58	0.57	0.55	**0.52**			0.57	$\rho = 0.9$
AIC	0.61	0.61	0.65	**0.52**				$Oracle$: 0.51
BIC	0.69	0.68	0.68	0.54				
CV.1se	20.93	20.70	20.50	19.70	20.35			
CV.min	19.78	19.65	19.69	20.92	**19.64**	19.66		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	19.76	19.76	20.60	20.41			19.76	$\rho = 0$
AIC	31.66	32.29	34.25	24.31				$Oracle$: 19.97
BIC	20.61	20.65	21.70	19.91				
CV.1se	8.31	8.18	8.01	7.93	7.74			
CV.min	7.82	7.71	7.66	8.19	**7.48**	7.65		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	7.78	7.74	7.98	8.10			7.78	$\rho = 0.5$
AIC	11.66	11.85	12.62	8.89				$Oracle$: 7.53
BIC	8.22	8.21	8.22	8.12				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	2.09	2.09	2.08	2.03			2.08	$\rho = 0.9$
AIC	2.66	2.74	3.05	2.03				$Oracle$: 2.04
BIC	2.10	2.09	2.08	2.07				

Table 17: **Prediction MSE for n=1000, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.62	0.58	0.53	1.08			**0.53**	$\rho = 0.9$
AIC	0.57	0.55	0.54	1.08				$Oracle$: 0.42
BIC	1.64	1.64	1.59	1.21				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	30.93	30.49	32.44	30.41			30.59	$\rho = 0$
AIC	41.93	42.89	45.60	33.25				$Oracle$: 26.59
BIC	40.50	39.02	47.09	34.53				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.92	11.46	11.22	12.03			11.40	$\rho = 0.5$
AIC	14.26	14.50	15.38	12.16				$Oracle$: 9.11
BIC	16.31	16.34	16.49	15.92				
CV.1se	2.86	2.70	2.63	2.46	2.21			
CV.min	2.56	2.37	2.38	2.31	**2.09**	2.31		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	2.60	2.59	2.53	2.31			2.48	$\rho = 0.9$
AIC	2.26	2.28	2.48	2.30				$Oracle$: 1.68
BIC	2.80	2.80	2.78	2.75				
CV.1se	119.93	120.31	120.82	113.86	120.03			
CV.min	113.81	115.93	119.70	118.93	113.89	114.14		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**113.42**	116.46	120.93	116.06			113.39	$\rho = 0$
AIC	173.78	179.27	187.58	144.00				$Oracle$: 106.35
BIC	120.69	120.84	120.92	119.52				
CV.1se	41.42	41.42	41.42	40.99	41.42			
CV.min	41.07	41.14	41.36	42.25	41.06	41.08		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				
CV.1se	7.60	7.59	7.57	7.50	7.60			
CV.min	7.40	7.39	7.37	7.40	**7.36**	7.37		$\mathrm{sd}(\mu)/\sigma = 0.5$
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 18: **Prediction MSE for n=1000, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	22.98	21.55	21.26	22.50			21.78	$\rho = 0.5$
AIC	25.54	26.06	27.54	22.37				$Oracle$: 16.04
BIC	29.05	29.08	29.14	28.80				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	4.74	4.81	4.76	4.23			4.70	$\rho = 0.9$
AIC	**3.92**	3.98	4.36	4.11				$Oracle$: 2.80
BIC	4.86	4.86	4.83	4.81				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**205.31**	212.39	215.21	209.69			205.37	$\rho = 0$
AIC	310.41	321.76	335.07	261.14				$Oracle$: 189.14
BIC	214.89	215.00	217.26	214.16				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**72.32**	72.89	72.96	73.92			72.31	$\rho = 0.5$
AIC	104.61	107.80	112.84	89.35				$Oracle$: 64.15
BIC	72.91	72.92	72.92	72.88				
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**		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**12.5**	12.58	12.60	12.60			12.50	$\rho = 0.9$
AIC	16.60	17.27	18.84	12.81				$Oracle$: 11.20
BIC	12.61	12.62	12.69	12.54				

Table 19: **Prediction MSE for n=1000, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	85.14	84.21	93.73	83.70			84.23	$\rho = 0$
AIC	111.39	114.82	121.21	91.72				$Oracle$: 69.47
BIC	125.83	125.78	126.15	116.17				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	35.81	32.73	**32.27**	33.80			33.55	$\rho = 0.5$
AIC	37.63	38.50	40.63	33.23				$Oracle$: 23.49
BIC	42.62	42.64	42.67	42.42				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.90	7.03	7.00	6.35			6.89	$\rho = 0.9$
AIC	**5.77**	5.89	6.45	5.97				$Oracle$: 4.03
BIC	7.09	7.11	7.11	7.01				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**303.58**	314.44	315.81	309.81			303.59	$\rho = 0$
AIC	456.70	475.12	493.35	386.66				$Oracle$: 277.88
BIC	315.72	315.81	351.65	314.97				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**106.08**	106.77	106.79	108.39			106.12	$\rho = 0.5$
AIC	153.36	158.62	165.71	131.58				$Oracle$: 93.96
BIC	106.77	106.78	106.79	106.75				
CV.1se	18.33	18.33	18.32	18.28	18.33			
CV.min	18.14	18.15	18.20	18.18	18.14	**18.14**		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**18.1**	18.22	18.29	18.23			18.10	$\rho = 0.9$
AIC	24.24	25.34	27.45	18.64				$Oracle$: 16.13
BIC	18.25	18.28	18.32	18.18				

Table 20: **Prediction MSE for n=100, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.67	0.63	0.46	0.50			0.46	$\rho = 0.9$
AIC	0.46	0.47	0.47	0.45				$Oracle$: 0.31
BIC	0.46	0.47	0.47	0.46				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.91	1.92	2.21	**1.73**			2.20	$\rho = 0$
AIC	2.21	2.22	2.24	2.15				$Oracle$: 1.40
BIC	2.20	2.21	2.24	2.15				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.74	1.76	1.97	**1.57**			1.97	$\rho = 0.5$
AIC	1.98	1.99	2.01	1.93				$Oracle$: 1.26
BIC	1.98	1.98	2.01	1.93				
CV.1se	1.88	1.87	1.88	1.54	1.86			
CV.min	1.66	1.72	1.82	1.72	1.67	1.67		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.66	1.67	1.86	**1.5**			1.86	$\rho = 0.9$
AIC	1.87	1.88	1.90	1.83				$Oracle$: 1.19
BIC	1.87	1.88	1.90	1.82				
CV.1se	5.67	5.67	5.68	6.91	5.67			
CV.min	5.68	5.70	5.71	8.23	5.72	5.72		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**5.61**	7.11	8.94	6.01			8.94	$\rho = 0$
AIC	8.88	8.93	9.00	8.74				$Oracle$: 5.30
BIC	8.87	8.92	9.00	8.73				
CV.1se	5.08	5.08	5.08	6.21	5.08			
CV.min	5.09	5.11	5.11	7.39	5.13	5.13		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**5.03**	6.20	7.98	5.41			7.99	$\rho = 0.5$
AIC	7.93	7.98	8.04	7.81				$Oracle$: 4.74
BIC	7.93	7.97	8.04	7.81				
CV.1se	4.82	4.83	4.83	5.84	4.83			
CV.min	4.84	4.85	4.86	6.96	4.86	4.89		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**4.77**	5.83	7.57	5.14			7.56	$\rho = 0.9$
AIC	7.53	7.57	7.63	7.41				$Oracle$: 4.52
BIC	7.52	7.56	7.63	7.40				

Table 21: **Prediction MSE for n=100, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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**				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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**				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	5.46	3.15	2.55	3.77			2.55	$\rho = 0.9$
AIC	2.52	2.54	2.56	**2.49**				$Oracle$: 2.31
BIC	2.52	2.54	2.56	**2.49**				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.31	11.06	12.10	**10.12**			12.09	$\rho = 0$
AIC	11.96	12.05	12.14	11.78				$Oracle$: 9.58
BIC	11.96	12.04	12.14	11.77				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	10.15	9.82	10.78	**9.06**			10.78	$\rho = 0.5$
AIC	10.66	10.73	10.82	10.49				$Oracle$: 8.54
BIC	10.65	10.72	10.82	10.49				
CV.1se	10.25	10.27	10.27	8.73	10.26			
CV.min	9.73	10.12	10.23	9.51	9.75	9.80		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	9.66	9.31	10.20	**8.66**			10.21	$\rho = 0.9$
AIC	10.09	10.16	10.24	9.93				$Oracle$: 8.05
BIC	10.08	10.15	10.24	9.93				
CV.1se	30.53	30.55	30.60	37.75	30.56			
CV.min	30.69	30.74	30.82	44.89	30.81	30.94		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**30.41**	45.69	48.52	32.65			48.53	$\rho = 0$
AIC	47.87	48.29	48.60	47.19				$Oracle$: 31.48
BIC	47.84	48.27	48.60	47.17				
CV.1se	27.31	27.33	27.33	33.73	27.33			
CV.min	27.44	27.49	27.51	39.84	27.55	27.71		$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				

Table 22: **Prediction MSE for n=100, binary design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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**				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	11.88	5.49	5.44	8.14			5.46	$\rho = 0.5$
AIC	5.37	5.41	5.45	5.31				$Oracle$: 5.45
BIC	5.37	5.41	5.45	**5.3**				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	11.29	5.27	5.17	7.86			5.16	$\rho = 0.9$
AIC	5.10	5.14	5.18	**5.04**				$Oracle$: 5.16
BIC	5.10	5.13	5.18	**5.04**				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	23.11	23.13	24.53	**20.63**			24.52	$\rho = 0$
AIC	24.21	24.42	24.58	23.85				$Oracle$: 21.34
BIC	24.20	24.41	24.58	23.84				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	19.53	19.34	20.61	**17.53**			20.58	$\rho = 0.9$
AIC	20.35	20.51	20.66	20.05				$Oracle$: 17.97
BIC	20.34	20.50	20.66	20.04				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				

Table 23: **Prediction MSE for n=100, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	27.01	12.04	12.33	18.27			12.32	$\rho = 0$
AIC	12.15	12.26	12.34	**12**				$Oracle$: 12.55
BIC	12.15	12.26	12.34	**12**				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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**				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	22.74	10.23	10.38	15.86			10.38	$\rho = 0.9$
AIC	10.24	10.33	10.39	**10.12**				$Oracle$: 10.60
BIC	10.23	10.32	10.39	**10.12**				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	46.69	47.26	49.34	**41.64**			49.49	$\rho = 0$
AIC	48.63	49.11	49.40	47.93				$Oracle$: 46.19
BIC	48.61	49.09	49.40	47.91				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	41.73	42.04	43.94	**37.24**			43.91	$\rho = 0.5$
AIC	43.31	43.73	43.99	42.68				$Oracle$: 41.04
BIC	43.29	43.72	43.99	42.67				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	39.23	39.74	41.49	**35.18**			41.47	$\rho = 0.9$
AIC	40.90	41.29	41.54	40.32				$Oracle$: 38.90
BIC	40.88	41.27	41.54	40.30				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**124.15**	193.36	198.18	133.05			198.35	$\rho = 0$
AIC	195.19	197.42	198.29	192.44				$Oracle$: 130.14
BIC	195.11	197.36	198.28	192.34				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**110.75**	171.44	176.10	118.55			175.96	$\rho = 0.5$
AIC	173.46	175.42	176.20	171.07				$Oracle$: 116.03
BIC	173.39	175.35	176.19	171.01				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**104.31**	161.77	166.42	112.41			166.20	$\rho = 0.9$
AIC	163.88	165.73	166.50	161.47				$Oracle$: 109.94
BIC	163.80	165.66	166.50	161.41				

Table 24: **Prediction MSE for n=100, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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**		$\mathrm{sd}(\mu)/\sigma = 1$
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				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**22.53**	24.53	35.87	24.03			33.38	$\rho = 0$
AIC	35.61	35.81	36.11	35.06				$Oracle$: 21.25
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	8.65		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**8.52**	8.61	13.38	9.09			11.49	$\rho = 0.5$
AIC	13.39	13.44	13.56	13.17				$Oracle$: 7.97
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	**2.26**		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				

Table 25: **Prediction MSE for n=100, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	25.41	22.67	12.22	17.14			14.70	$\rho = 0$
AIC	12.07	12.15	12.26	11.89				
BIC	12.07	12.14	12.26	**11.88**				$Oracle$: 11.08
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	9.31	10.16	4.16	6.64			5.91	$\rho = 0.5$
AIC	4.13	4.15	4.18	4.09				
BIC	4.13	4.14	4.18	**4.08**				$Oracle$: 3.78
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.55	1.78	1.31	1.26			1.53	$\rho = 0.9$
AIC	0.75	0.75	0.76	**0.74**				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**42.17**	50.84	66.80	45.06			59.79	$\rho = 0.5$
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.min	7.71	7.73	7.78	8.64	7.74	7.76		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**7.66**	7.72	12.06	8.10			7.97	$\rho = 0.9$
AIC	11.97	12.05	12.19	11.58				
BIC	11.96	12.05	12.18	10.18				$Oracle$: 7.75

Table 26: **Prediction MSE for n=100, continuous design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	53.49	32.73	24.78	36.31			29.58	$\rho = 0$
AIC	24.45	24.64	24.82	**24.13**				$Oracle$: 24.83
BIC	24.44	24.63	24.82	24.14				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	93.78	93.69	99.07	**83.67**			97.14	$\rho = 0$
AIC	97.75	98.62	99.27	96.27				$Oracle$: 86.46
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	32.68		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	32.08	32.43	33.36	28.83			33.03	$\rho = 0.5$
AIC	33.02	33.24	33.49	32.55				$Oracle$: 29.19
BIC	33.00	33.22	33.49	32.53				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.44	5.70	5.62	5.05			5.46	$\rho = 0.9$
AIC	5.58	5.61	5.68	5.42				$Oracle$: 4.90
BIC	5.58	5.61	5.68	5.44				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**249.33**	381.45	396.97	266.84			369.87	$\rho = 0$
AIC	391.16	395.18	397.28	385.61				$Oracle$: 260.93
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	85.82		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**84.43**	117.72	133.55	90.21			120.78	$\rho = 0.5$
AIC	131.83	132.94	133.82	129.89				$Oracle$: 87.87
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	14.53		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**14.39**	14.47	22.61	15.14			15.23	$\rho = 0.9$
AIC	22.32	22.50	22.75	21.62				$Oracle$: 14.79
BIC	22.31	22.50	22.74	18.94				

Table 27: **Prediction MSE for n=100, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	109.36	52.25	49.94	74.35			58.01	$\rho = 0$
AIC	49.18	49.63	49.96	48.59				
BIC	49.16	49.61	49.96	**48.58**				$Oracle$: 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	38.69		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	37.84	29.69	16.67	26.77			22.67	$\rho = 0.5$
AIC	16.46	16.57	16.70	16.31				
BIC	16.45	16.57	16.69	**16.3**				$Oracle$: 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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	6.19	6.79	2.75	4.94			5.95	$\rho = 0.9$
AIC	2.70	2.71	2.74	**2.67**				
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		$\mathrm{sd}(\mu)/\sigma = 1$
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				$Oracle$: 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	65.33		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 1$
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				$Oracle$: 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	171.26		$\mathrm{sd}(\mu)/\sigma = 0.5$
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				$Oracle$: 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	27.95		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**27.75**	28.33	43.63	29.27			29.04	$\rho = 0.9$
AIC	43.01	43.43	43.86	41.67				
BIC	42.99	43.41	43.84	36.55				$Oracle$: 28.81

Table 28: **Prediction MSE for n=100, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma=1$	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**		$\mathrm{sd}(\mu)/\sigma=2$
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				
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**		$\mathrm{sd}(\mu)/\sigma=2$
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				
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**		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=1$
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				
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		$\mathrm{sd}(\mu)/\sigma=1$
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				
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		$\mathrm{sd}(\mu)/\sigma=1$
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				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
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				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
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				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**4.13**	4.86	6.53	4.42			6.54	$\rho=0.9$
AIC	6.50	6.54	6.59	6.40				$Oracle$: 3.69
BIC	6.50	6.53	6.59	6.39				

Table 29: **Prediction MSE for n=100, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.05	0.79	0.81	0.82			0.82	$\rho = 0.9$
AIC	0.83	0.83	0.84	0.79				$Oracle$: 0.48
BIC	0.83	0.83	0.84	0.79				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	3.43	3.42	3.99	**3.09**			3.99	$\rho = 0$
AIC	3.97	3.99	4.03	3.87				$Oracle$: 2.25
BIC	3.96	3.99	4.03	3.86				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	3.13	3.09	3.55	**2.82**			3.56	$\rho = 0.5$
AIC	3.54	3.56	3.59	3.46				$Oracle$: 2.01
BIC	3.54	3.55	3.59	3.45				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	2.98	2.94	3.35	**2.68**			3.34	$\rho = 0.9$
AIC	3.34	3.35	3.39	3.26				$Oracle$: 1.90
BIC	3.33	3.35	3.39	3.26				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**10.09**	14.04	16.09	10.77			16.07	$\rho = 0$
AIC	15.93	16.04	16.16	15.68				$Oracle$: 9.00
BIC	15.92	16.03	16.16	15.66				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**9.02**	12.34	14.33	9.64			14.32	$\rho = 0.5$
AIC	14.20	14.29	14.40	13.98				$Oracle$: 8.05
BIC	14.19	14.29	14.40	13.97				
CV.1se	8.59	8.60	8.60	10.43	8.59			
CV.min	8.62	8.64	8.65	12.40	8.66	8.71		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**8.52**	11.58	13.53	9.14			13.53	$\rho = 0.9$
AIC	13.40	13.49	13.60	13.19				$Oracle$: 7.61
BIC	13.39	13.48	13.59	13.18				

Table 30: **Prediction MSE for n=100, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma=1$	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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=2$
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				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	3.81	3.81	4.44	**3.44**			4.44	$\rho=0$
AIC	4.41	4.43	4.48	4.30				$Oracle$: 2.50
BIC	4.40	4.43	4.48	4.29				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	3.48	3.43	3.95	**3.13**			3.95	$\rho=0.5$
AIC	3.93	3.95	3.99	3.84				$Oracle$: 2.23
BIC	3.93	3.95	3.99	3.84				
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		$\mathrm{sd}(\mu)/\sigma=1$
AICc	3.32	3.26	3.73	**2.98**			3.73	$\rho=0.9$
AIC	3.71	3.73	3.77	3.63				$Oracle$: 2.11
BIC	3.71	3.73	3.77	3.63				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**11.21**	15.81	17.90	11.99			17.88	$\rho=0$
AIC	17.71	17.84	17.97	17.43				$Oracle$: 9.99
BIC	17.70	17.83	17.97	17.42				
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		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**10**	13.91	15.92	10.71			15.95	$\rho=0.5$
AIC	15.76	15.87	15.99	15.52				$Oracle$: 8.94
BIC	15.76	15.86	15.99	15.51				
CV.1se	9.54	9.55	9.56	11.59	9.54			
CV.min	9.59	9.59	9.61	13.78	9.62	9.66		$\mathrm{sd}(\mu)/\sigma=0.5$
AICc	**9.46**	13.05	15.04	10.15			15.03	$\rho=0.9$
AIC	14.89	14.99	15.10	14.65				$Oracle$: 8.45
BIC	14.88	14.98	15.10	14.65				

Table 31: **Prediction MSE for n=100, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.24	0.90	0.96	0.95			0.96	$\rho = 0.9$
AIC	0.97	0.97	0.99	0.93				$Oracle$: 0.56
BIC	0.97	0.97	0.99	0.93				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	4.02	4.02	4.68	**3.62**			4.68	$\rho = 0$
AIC	4.64	4.67	4.72	4.53				$Oracle$: 2.63
BIC	4.64	4.67	4.72	4.52				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	3.68	3.62	4.18	**3.31**			4.18	$\rho = 0.5$
AIC	4.15	4.18	4.22	4.06				$Oracle$: 2.36
BIC	4.15	4.17	4.22	4.06				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	3.51	3.44	3.94	**3.14**			3.93	$\rho = 0.9$
AIC	3.91	3.94	3.97	3.83				$Oracle$: 2.23
BIC	3.91	3.93	3.97	3.82				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**11.84**	16.71	18.88	12.64			18.88	$\rho = 0$
AIC	18.67	18.80	18.95	18.38				$Oracle$: 10.54
BIC	18.66	18.80	18.95	18.37				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**10.57**	14.75	16.82	11.29			16.83	$\rho = 0.5$
AIC	16.65	16.76	16.89	16.39				$Oracle$: 9.44
BIC	16.64	16.75	16.89	16.38				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**9.97**	13.86	15.85	10.70			15.87	$\rho = 0.9$
AIC	15.69	15.79	15.92	15.44				$Oracle$: 8.92
BIC	15.68	15.79	15.91	15.43				

Table 32: **Prediction MSE for n=100, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	AL	MCP	CVbest	ICbest	
CV.1se	2.65	2.33	2.63	1.63	1.93			
CV.min	1.71	1.64	1.90	1.64	**1.61**	1.65		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.96	1.96	1.87	1.63			1.85	$\rho = 0$
AIC	1.89	1.89	1.92	1.77				$Oracle$: 1.09
BIC	1.89	1.89	1.92	1.77				
CV.1se	1.76	1.68	1.59	0.92	1.46			
CV.min	1.27	1.26	1.37	0.75	1.13	1.22		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	1.32	1.51	0.95	1.00			1.08	$\rho = 0.5$
AIC	0.75	0.75	0.76	**0.73**				$Oracle$: 0.43
BIC	0.75	0.75	0.76	0.85				
CV.1se	0.38	0.36	0.32	0.26	0.33			
CV.min	0.29	0.29	0.29	0.20	0.28	0.28		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.29	0.33	0.32	0.22			0.29	$\rho = 0.9$
AIC	0.19	0.19	0.20	**0.18**				$Oracle$: 0.11
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	6.47		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.35	7.08	7.66	**5.83**			7.24	$\rho = 0$
AIC	7.68	7.71	7.80	7.45				$Oracle$: 4.37
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		$\mathrm{sd}(\mu)/\sigma = 1$
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
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.64	0.68	0.66	**0.61**			0.64	$\rho = 0.9$
AIC	0.78	0.78	0.80	0.71				$Oracle$: 0.45
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
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
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**7.68**	7.76	12.06	8.19			10.37	$\rho = 0.5$
AIC	12.08	12.13	12.24	11.88				$Oracle$: 6.84
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	2.02	2.23	2.00	2.01		$\mathrm{sd}(\mu)/\sigma = 0.5$
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
BIC	3.16	3.17	3.21	2.43				

Table 33: **Prediction MSE for n=100, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	13.72	15.18	16.02	**12.39**			15.45	$\rho = 0$
AIC	15.92	16.01	16.18	15.51				$Oracle$: 9.05
BIC	15.91	16.00	16.18	15.49				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.67	6.04	6.02	**5.09**			5.91	$\rho = 0.5$
AIC	6.05	6.07	6.13	5.93				$Oracle$: 3.43
BIC	6.05	6.07	6.13	5.92				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.22	1.34	1.32	**1.13**			1.21	$\rho = 0.9$
AIC	1.36	1.37	1.38	1.30				$Oracle$: 0.78
BIC	1.36	1.36	1.38	1.25				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**40.65**	49.38	64.74	43.30			59.90	$\rho = 0$
AIC	64.05	64.49	65.00	63.04				$Oracle$: 36.24
BIC	64.02	64.47	64.99	63.01				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**15.41**	15.84	24.32	16.43			21.33	$\rho = 0.5$
AIC	24.20	24.32	24.53	23.82				$Oracle$: 13.70
BIC	24.18	24.31	24.52	23.81				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**3.49**	3.53	5.40	3.67			3.57	$\rho = 0.9$
AIC	5.47	5.49	5.56	5.28				$Oracle$: 3.12
BIC	5.46	5.49	5.56	4.57				

Table 34: **Prediction MSE for n=100, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	15.27	16.82	17.83	**13.78**			17.13	$\rho = 0$
AIC	17.69	17.80	17.98	17.24				$Oracle$: 10.05
BIC	17.68	17.79	17.98	17.21				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.30	6.72	6.70	**5.66**			6.54	$\rho = 0.5$
AIC	6.71	6.74	6.80	6.59				$Oracle$: 3.80
BIC	6.71	6.73	6.80	6.58				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.35	1.49	1.45	**1.25**			1.35	$\rho = 0.9$
AIC	1.50	1.51	1.53	1.44				$Oracle$: 0.86
BIC	1.50	1.51	1.53	1.40				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**45.06**	56.09	71.78	48.00			66.96	$\rho = 0$
AIC	70.97	71.48	72.03	69.85				$Oracle$: 40.18
BIC	70.94	71.46	72.01	69.82				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**17.13**	17.71	27.06	18.28			23.99	$\rho = 0.5$
AIC	26.90	27.05	27.27	26.48				$Oracle$: 15.23
BIC	26.89	27.04	27.27	26.47				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**3.86**	3.90	5.99	4.06			4.01	$\rho = 0.9$
AIC	6.03	6.06	6.14	5.83				$Oracle$: 3.44
BIC	6.03	6.06	6.13	5.05				

Table 35: **Prediction MSE for n=100, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
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				
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		$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.66	0.79	0.69	0.54			0.66	$\rho = 0.9$
AIC	0.39	0.40	0.40	**0.38**				$Oracle$: 0.23
BIC	0.39	0.40	0.40	0.62				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	16.16	17.75	18.84	**14.55**			18.25	$\rho = 0$
AIC	18.68	18.80	18.99	18.21				$Oracle$: 10.62
BIC	18.67	18.79	18.99	18.18				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.63	7.07	7.06	**5.96**			6.89	$\rho = 0.5$
AIC	7.07	7.10	7.17	6.94				$Oracle$: 4.01
BIC	7.07	7.10	7.17	6.93				
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		$\mathrm{sd}(\mu)/\sigma = 1$
AICc	1.42	1.57	1.53	**1.32**			1.43	$\rho = 0.9$
AIC	1.59	1.59	1.61	1.52				$Oracle$: 0.91
BIC	1.58	1.59	1.61	1.47				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**47.6**	59.96	75.78	50.67			70.76	$\rho = 0$
AIC	74.93	75.47	76.04	73.75				$Oracle$: 42.43
BIC	74.89	75.44	76.03	73.72				
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		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**18.08**	18.83	28.56	19.27			24.76	$\rho = 0.5$
AIC	28.38	28.53	28.78	27.94				$Oracle$: 16.07
BIC	28.36	28.52	28.77	27.92				
CV.1se	4.11	4.11	4.11	4.17	4.11			
CV.min	4.10	4.11	4.14	4.61	4.11	4.13		$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**4.07**	4.11	6.32	4.28			4.19	$\rho = 0.9$
AIC	6.36	6.39	6.47	6.14				$Oracle$: 3.62
BIC	6.36	6.39	6.47	5.28				

Table 36: **Estimation MSE for n=1000, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	0.327	**0**	
CV.min	**0**	**0**	**0**	0.317	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.317		$\rho = 0$
AIC	**0**	**0**	**0**	0.317		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.328		
CV.1se	**0**	**0**	**0**	0.295	**0**	
CV.min	**0**	**0**	**0**	0.286	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.286		$\rho = 0.5$
AIC	**0**	**0**	**0**	0.286		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.297		
CV.1se	**0**	**0**	**0**	0.281	**0**	
CV.min	**0**	**0**	**0**	0.272	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.272		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.272		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.283		
CV.1se	**0**	**0**	**0**	1.246	**0**	
CV.min	**0**	**0**	**0**	1.276	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	1.266		$\rho = 0$
AIC	0.010	0.010	0.013	1.313		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.267		
CV.1se	**0**	**0**	**0**	1.118	**0**	
CV.min	**0**	**0**	**0**	1.146	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	1.135		$\rho = 0.5$
AIC	0.009	0.010	0.011	1.180		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.142		
CV.1se	**0**	**0**	**0**	1.063	**0**	
CV.min	**0**	**0**	**0**	1.084	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	1.078		$\rho = 0.9$
AIC	0.008	0.009	0.010	1.114		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.086		
CV.1se	**0**	**0**	**0**	4.898	**0**	
CV.min	**0**	**0**	**0**	5.206	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.002	5.084		$\rho = 0$
AIC	0.049	0.060	0.124	6.069		$Oracle$: 0.000
BIC	**0**	**0**	**0**	4.955		
CV.1se	**0**	**0**	**0**	4.394	**0**	
CV.min	**0**	**0**	**0**	4.670	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.002	4.552		$\rho = 0.5$
AIC	0.044	0.052	0.106	5.443		$Oracle$: 0.000
BIC	**0**	**0**	**0**	4.459		
CV.1se	**0**	**0**	**0**	4.169	**0**	
CV.min	**0**	**0**	**0**	4.402	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.002	4.310		$\rho = 0.9$
AIC	0.038	0.046	0.093	5.079		$Oracle$: 0.000
BIC	**0**	**0**	**0**	4.234		

Table 37: **Estimation MSE for n=1000, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.001	**0**	0.001	2.152	**0**	
CV.min	**0**	**0**	**0**	2.073	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	0.001	2.086		$\rho = 0$
AIC	0.011	0.012	0.021	2.074		$Oracle$: 0.000
BIC	0.009	0.007	0.003	2.466		
CV.1se	0.001	**0**	**0**	1.950	**0**	
CV.min	**0**	**0**	**0**	1.872	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.886		$\rho = 0.5$
AIC	0.010	0.011	0.018	1.871		$Oracle$: 0.000
BIC	0.010	0.008	0.002	2.266		
CV.1se	**0**	**0**	**0**	1.853	**0**	
CV.min	**0**	**0**	**0**	1.775	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.789		$\rho = 0.9$
AIC	0.010	0.010	0.016	1.771		$Oracle$: 0.000
BIC	0.010	0.008	0.002	2.165		
CV.1se	**0.01**	**0.01**	0.012	7.835	0.011	
CV.min	**0.01**	**0.01**	0.011	7.853	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.018	7.797		$\rho = 0$
AIC	0.065	0.081	0.167	8.518		$Oracle$: 0.001
BIC	0.018	0.016	0.018	8.899		
CV.1se	**0.01**	**0.01**	0.011	7.048	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	7.049	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.015	7.009		$\rho = 0.5$
AIC	0.058	0.071	0.143	7.652		$Oracle$: 0.000
BIC	0.019	0.017	0.018	8.140		
CV.1se	**0.01**	**0.01**	0.012	6.691	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	6.666	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.014	6.640		$\rho = 0.9$
AIC	0.051	0.063	0.126	7.179		$Oracle$: 0.000
BIC	0.019	0.017	0.018	7.765		
CV.1se	**0.02**	**0.02**	**0.02**	28.909	**0.02**	
CV.min	**0.02**	0.021	0.022	30.228	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	0.023	0.042	29.490		$\rho = 0$
AIC	0.366	0.541	1.226	36.584		$Oracle$: 0.011
BIC	**0.02**	**0.02**	**0.02**	30.299		
CV.1se	**0.02**	**0.02**	**0.02**	25.851	**0.02**	
CV.min	**0.02**	**0.02**	0.021	26.996	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	0.022	0.044	26.364		$\rho = 0.5$
AIC	0.321	0.465	1.038	32.773		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	26.972		
CV.1se	**0.02**	**0.02**	**0.02**	24.469	**0.02**	
CV.min	**0.02**	**0.02**	0.021	25.451	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	0.021	0.037	24.912		$\rho = 0.9$
AIC	0.282	0.409	0.913	30.656		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	25.452		

Table 38: **Estimation MSE for n=1000, binary design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.012	0.012	0.014	4.956	**0.011**	
CV.min	**0.011**	**0.011**	0.012	4.695	**0.011**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.012	**0.011**	0.014	4.815		$\rho = 0$
AIC	0.028	0.033	0.060	4.645		$Oracle$: 0.004
BIC	0.038	0.024	0.018	6.801		
CV.1se	0.012	0.011	0.013	4.503	0.011	
CV.min	0.011	**0.01**	0.011	4.251	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.012	0.011	0.012	4.374		$\rho = 0.5$
AIC	0.025	0.029	0.051	4.189		$Oracle$: 0.003
BIC	0.044	0.026	0.016	6.478		
CV.1se	0.011	0.011	0.012	4.298	**0.01**	
CV.min	**0.01**	**0.01**	0.011	4.038	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.012	**0.01**	0.011	4.166		$\rho = 0.9$
AIC	0.022	0.026	0.045	3.966		$Oracle$: 0.001
BIC	0.045	0.027	0.016	6.314		
CV.1se	0.033	0.036	0.047	17.232	0.032	
CV.min	**0.029**	0.031	0.044	17.042	**0.029**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.030	0.031	0.058	17.035		$\rho = 0$
AIC	0.153	0.206	0.438	18.371		$Oracle$: 0.013
BIC	0.050	0.049	0.050	22.969		
CV.1se	0.034	0.036	0.047	15.520	0.033	
CV.min	**0.029**	0.030	0.042	15.309	**0.029**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.030	0.030	0.052	15.325		$\rho = 0.5$
AIC	0.135	0.178	0.371	16.446		$Oracle$: 0.012
BIC	0.050	0.050	0.050	20.830		
CV.1se	0.034	0.036	0.047	14.725	0.033	
CV.min	**0.029**	0.030	0.041	14.478	**0.029**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.030	**0.029**	0.048	14.519		$\rho = 0.9$
AIC	0.119	0.157	0.326	15.468		$Oracle$: 0.010
BIC	0.050	0.050	0.050	19.694		
CV.1se	0.050	0.050	0.050	59.962	0.050	
CV.min	0.048	0.050	0.051	62.566	0.048	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.047**	0.064	0.084	60.970		$\rho = 0$
AIC	0.787	1.298	2.923	76.055		$Oracle$: 0.035
BIC	0.050	0.050	0.050	61.780		
CV.1se	0.050	0.050	0.050	53.461	0.050	
CV.min	**0.048**	0.050	0.050	55.742	**0.048**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.048**	0.059	0.086	54.383		$\rho = 0.5$
AIC	0.685	1.102	2.446	67.971		$Oracle$: 0.032
BIC	0.050	0.050	0.050	54.813		
CV.1se	0.050	0.050	0.050	50.504	0.050	
CV.min	0.049	0.050	0.050	52.515	0.049	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.048**	0.058	0.077	51.289		$\rho = 0.9$
AIC	0.599	0.962	2.148	63.527		$Oracle$: 0.030
BIC	0.050	0.050	0.050	51.622		

Table 39: **Estimation MSE for n=1000, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.045	0.051	0.073	11.519	0.044	
CV.min	**0.041**	0.045	0.064	10.643	**0.041**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.050	0.049	0.063	11.423		$\rho = 0$
AIC	0.073	0.091	0.165	10.286		$Oracle$: 0.022
BIC	0.100	0.100	0.084	28.560		
CV.1se	0.046	0.050	0.070	10.534	0.044	
CV.min	0.040	0.043	0.061	9.689	**0.039**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.051	0.048	0.056	10.446		$\rho = 0.5$
AIC	0.065	0.079	0.141	9.284		$Oracle$: 0.020
BIC	0.100	0.100	0.086	26.122		
CV.1se	0.044	0.048	0.068	10.077	0.042	
CV.min	0.038	0.041	0.057	9.205	**0.037**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.051	0.046	0.052	9.991		$\rho = 0.9$
AIC	0.058	0.071	0.125	8.774		$Oracle$: 0.020
BIC	0.100	0.100	0.085	24.745		
CV.1se	0.085	0.097	0.100	37.260	0.085	
CV.min	**0.076**	0.092	0.102	36.419	**0.076**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.079	0.090	0.174	36.800		$\rho = 0$
AIC	0.341	0.501	1.066	38.733		$Oracle$: 0.051
BIC	0.100	0.100	0.100	49.271		
CV.1se	0.088	0.098	0.100	33.534	0.087	
CV.min	**0.076**	0.090	0.101	32.694	**0.076**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.080	0.085	0.155	33.103		$\rho = 0.5$
AIC	0.299	0.430	0.902	34.602		$Oracle$: 0.046
BIC	0.100	0.100	0.100	43.762		
CV.1se	0.089	0.097	0.100	31.823	0.088	
CV.min	**0.075**	0.089	0.100	30.897	**0.075**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.080	0.083	0.140	31.341		$\rho = 0.9$
AIC	0.263	0.377	0.791	32.503		$Oracle$: 0.043
BIC	0.100	0.100	0.100	41.208		
CV.1se	**0.1**	**0.1**	**0.1**	122.287	**0.1**	
CV.min	**0.1**	0.101	0.102	127.558	**0.1**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.1**	0.170	0.142	124.377		$\rho = 0$
AIC	1.633	3.025	6.593	155.355		$Oracle$: 0.101
BIC	**0.1**	**0.1**	0.263	124.518		
CV.1se	**0.1**	**0.1**	**0.1**	108.720	**0.1**	
CV.min	**0.1**	0.101	0.101	113.445	**0.1**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.1**	0.151	0.136	110.585		$\rho = 0.5$
AIC	1.417	2.558	5.552	138.308		$Oracle$: 0.093
BIC	**0.1**	**0.1**	0.130	110.289		
CV.1se	**0.1**	**0.1**	**0.1**	102.616	**0.1**	
CV.min	**0.1**	0.101	0.101	106.748	**0.1**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.1**	0.143	0.131	104.334		$\rho = 0.9$
AIC	1.238	2.230	4.877	129.462		$Oracle$: 0.088
BIC	**0.1**	**0.1**	0.133	103.847		

Table 40: **Estimation MSE for n=1000, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	1.315	**0**	
CV.min	**0**	**0**	**0**	1.273	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.274		$\rho = 0$
AIC	**0**	**0**	**0**	1.273		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.319		
CV.1se	**0**	**0**	**0**	0.610	**0**	
CV.min	**0**	**0**	**0**	0.586	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.586		$\rho = 0.5$
AIC	**0**	**0**	**0**	0.586		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.606		
CV.1se	**0**	**0**	**0**	0.174	**0**	
CV.min	**0**	**0**	**0**	0.167	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.167		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.167		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.167		
CV.1se	**0**	**0**	**0**	5.000	**0**	
CV.min	**0**	**0**	**0**	5.128	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	5.078		$\rho = 0$
AIC	0.009	0.010	0.010	5.273		$Oracle$: 0.000
BIC	**0**	**0**	**0**	5.090		
CV.1se	**0**	**0**	**0**	2.083	**0**	
CV.min	**0**	**0**	**0**	2.069	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	2.065		$\rho = 0.5$
AIC	**0**	**0**	0.001	2.075		$Oracle$: 0.000
BIC	**0**	**0**	**0**	2.230		
CV.1se	**0**	**0**	**0**	0.544	**0**	
CV.min	**0**	**0**	**0**	0.523	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	0.523		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.523		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.537		
CV.1se	**0**	**0**	**0**	19.703	**0**	
CV.min	**0**	**0**	**0**	20.923	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	**0**	20.418		$\rho = 0$
AIC	0.040	0.048	0.099	24.317		$Oracle$: 0.000
BIC	**0**	**0**	**0**	19.916		
CV.1se	**0**	**0**	**0**	7.931	**0**	
CV.min	**0**	**0**	**0**	8.186	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	**0**	8.095		$\rho = 0.5$
AIC	0.019	0.021	0.042	8.893		$Oracle$: 0.000
BIC	**0**	**0**	**0**	8.112		
CV.1se	**0**	**0**	**0**	2.050	**0**	
CV.min	**0**	**0**	**0**	2.023	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	**0**	2.025		$\rho = 0.9$
AIC	0.009	0.010	0.019	2.034		$Oracle$: 0.000
BIC	**0**	**0**	**0**	2.065		

Table 41: **Estimation MSE for n=1000, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	8.620	**0**	
CV.min	**0**	**0**	**0**	8.311	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	8.361		$\rho = 0$
AIC	0.010	0.010	0.018	8.317		$Oracle$: 0.000
BIC	0.009	0.007	0.004	9.857		
CV.1se	0.005	0.002	**0**	3.801	**0**	
CV.min	**0**	**0**	**0**	3.525	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.005	**0**	**0**	3.595		$\rho = 0.5$
AIC	0.002	0.003	0.010	3.490		$Oracle$: 0.000
BIC	0.016	0.011	0.006	5.592		
CV.1se	0.008	0.005	0.001	1.172	0.001	
CV.min	0.001	**0**	**0**	1.100	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.009	0.005	**0**	1.101		$\rho = 0.9$
AIC	0.001	**0**	**0**	1.101		$Oracle$: 0.000
BIC	0.020	0.020	0.020	1.249		
CV.1se	**0.01**	**0.01**	0.011	31.413	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	31.517	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.012	31.267		$\rho = 0$
AIC	0.052	0.065	0.133	34.153		$Oracle$: 0.000
BIC	0.018	0.017	0.020	35.773		
CV.1se	0.017	0.014	0.013	12.681	0.011	
CV.min	**0.01**	**0.01**	0.011	12.242	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.012	**0.01**	**0.01**	12.337		$\rho = 0.5$
AIC	0.026	0.030	0.058	12.454		$Oracle$: 0.000
BIC	0.020	0.020	0.020	16.238		
CV.1se	0.020	0.019	0.018	2.504	0.013	
CV.min	0.017	0.015	0.015	2.349	0.011	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.019	0.018	0.017	2.352		$\rho = 0.9$
AIC	**0.01**	**0.01**	0.017	2.342		$Oracle$: 0.000
BIC	0.020	0.020	0.020	2.786		
CV.1se	**0.02**	**0.02**	**0.02**	116.202	**0.02**	
CV.min	**0.02**	**0.02**	0.021	121.387	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	**0.02**	**0.02**	118.438		$\rho = 0$
AIC	0.291	0.430	0.972	146.789		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	121.842		
CV.1se	**0.02**	**0.02**	**0.02**	41.750	**0.02**	
CV.min	**0.02**	**0.02**	**0.02**	43.030	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	**0.02**	**0.02**	42.506		$\rho = 0.5$
AIC	0.144	0.197	0.433	50.747		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	42.059		
CV.1se	**0.02**	**0.02**	**0.02**	7.597	**0.02**	
CV.min	**0.02**	**0.02**	**0.02**	7.502	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	**0.02**	**0.02**	7.521		$\rho = 0.9$
AIC	0.049	0.065	0.150	7.602		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	7.478		

Table 42: **Estimation MSE for n=1000, continuous design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.01**	**0.01**	0.012	19.847	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	18.825	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.01**	**0.01**	**0.01**	19.301		$\rho = 0$
AIC	0.022	0.027	0.048	18.624		$Oracle$: 0.001
BIC	0.037	0.025	0.017	27.156		
CV.1se	0.016	0.013	0.011	9.114	0.011	
CV.min	**0.01**	**0.01**	**0.01**	8.028	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.019	0.014	**0.01**	8.657		$\rho = 0.5$
AIC	0.011	0.013	0.022	7.574		$Oracle$: 0.000
BIC	0.050	0.050	0.041	20.270		
CV.1se	0.019	0.015	0.012	2.705	0.012	
CV.min	0.011	**0.01**	**0.01**	2.387	0.011	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.023	0.017	**0.01**	2.399		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	2.365		$Oracle$: 0.000
BIC	0.050	0.050	0.050	3.283		
CV.1se	0.032	0.034	0.045	69.034	0.031	
CV.min	**0.027**	0.029	0.039	68.319	**0.027**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.029	0.029	0.045	68.304		$\rho = 0$
AIC	0.123	0.164	0.346	73.648		$Oracle$: 0.010
BIC	0.050	0.050	0.050	91.755		
CV.1se	0.049	0.048	0.050	27.976	0.046	
CV.min	0.039	0.039	0.049	26.470	0.038	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.041	0.037	**0.033**	27.003		$\rho = 0.5$
AIC	0.064	0.080	0.159	26.460		$Oracle$: 0.010
BIC	0.050	0.050	0.050	33.302		
CV.1se	0.050	0.050	0.050	5.369	0.050	
CV.min	0.050	0.050	0.050	4.956	0.049	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.050	0.050	0.050	4.924		$\rho = 0.9$
AIC	**0.029**	0.031	0.053	4.755		$Oracle$: 0.010
BIC	0.050	0.050	0.050	5.466		
CV.1se	0.050	0.050	0.050	240.830	0.050	
CV.min	0.046	0.050	0.050	250.983	0.046	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.045**	0.051	0.050	244.772		$\rho = 0$
AIC	0.627	1.030	2.309	305.325		$Oracle$: 0.031
BIC	0.050	0.050	0.238	248.166		
CV.1se	**0.05**	**0.05**	**0.05**	83.694	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	86.330	**0.05**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.05**	**0.05**	**0.05**	85.272		$\rho = 0.5$
AIC	0.302	0.452	1.008	103.480		$Oracle$: 0.021
BIC	**0.05**	**0.05**	**0.05**	83.993		
CV.1se	**0.05**	**0.05**	**0.05**	14.287	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	14.208	**0.05**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.05**	**0.05**	**0.05**	14.248		$\rho = 0.9$
AIC	0.122	0.175	0.399	14.525		$Oracle$: 0.021
BIC	**0.05**	**0.05**	**0.05**	14.168		

Table 43: **Estimation MSE for n=1000, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.041	0.045	0.065	46.053	0.039	
CV.min	0.036	0.039	0.055	42.622	**0.035**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.047	0.044	0.052	45.755		$\rho = 0$
AIC	0.059	0.072	0.130	41.207		$Oracle$: 0.020
BIC	0.100	0.100	0.074	114.308		
CV.1se	0.060	0.061	0.095	23.346	0.056	
CV.min	0.041	0.042	0.086	19.498	0.041	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.078	0.058	0.042	22.139		$\rho = 0.5$
AIC	**0.038**	0.042	0.066	16.298		$Oracle$: 0.010
BIC	0.100	0.100	0.098	41.460		
CV.1se	0.086	0.086	0.100	6.322	0.093	
CV.min	0.064	0.066	0.099	5.325	0.078	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.100	0.094	0.042	5.277		$\rho = 0.9$
AIC	0.037	**0.033**	0.037	4.532		$Oracle$: 0.010
BIC	0.100	0.100	0.100	6.597		
CV.1se	0.083	0.095	0.100	148.986	0.082	
CV.min	**0.07**	0.086	0.100	145.735	**0.07**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.076	0.080	0.124	147.233		$\rho = 0$
AIC	0.272	0.396	0.843	154.980		$Oracle$: 0.044
BIC	0.100	0.100	0.150	197.277		
CV.1se	0.100	0.100	0.100	59.814	0.100	
CV.min	0.097	0.099	0.100	55.908	0.097	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.096**	0.098	0.097	57.338		$\rho = 0.5$
AIC	0.145	0.193	0.387	54.755		$Oracle$: 0.030
BIC	0.100	0.100	0.100	66.869		
CV.1se	0.100	0.100	0.100	10.892	0.100	
CV.min	0.100	0.100	0.100	10.352	0.100	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.100	0.100	0.100	10.271		$\rho = 0.9$
AIC	**0.075**	0.089	0.161	9.447		$Oracle$: 0.029
BIC	0.100	0.100	0.100	10.781		
CV.1se	0.100	0.100	0.100	490.719	0.100	
CV.min	**0.098**	0.101	0.101	511.451	**0.098**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.098**	0.106	0.100	498.621		$\rho = 0$
AIC	1.303	2.403	5.214	623.452		$Oracle$: 0.090
BIC	0.100	0.100	3.583	499.327		
CV.1se	**0.1**	**0.1**	**0.1**	167.371	**0.1**	
CV.min	**0.1**	**0.1**	**0.1**	172.579	**0.1**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.1**	**0.1**	**0.1**	170.568		$\rho = 0.5$
AIC	0.613	1.017	2.251	208.452		$Oracle$: 0.069
BIC	**0.1**	**0.1**	0.143	167.685		
CV.1se	**0.1**	**0.1**	**0.1**	27.529	**0.1**	
CV.min	**0.1**	**0.1**	**0.1**	27.546	**0.1**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.1**	**0.1**	**0.1**	27.607		$\rho = 0.9$
AIC	0.278	0.439	0.979	28.306		$Oracle$: 0.068
BIC	**0.1**	**0.1**	**0.1**	27.474		

Table 44: **Estimation MSE for n=1000, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	0.328	**0**	
CV.min	**0**	**0**	**0**	0.317	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.317		$\rho = 0$
AIC	**0**	**0**	**0**	0.317		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.328		
CV.1se	**0**	**0**	**0**	0.295	**0**	
CV.min	**0**	**0**	**0**	0.285	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.286		$\rho = 0.5$
AIC	**0**	**0**	**0**	0.285		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.297		
CV.1se	**0**	**0**	**0**	0.281	**0**	
CV.min	**0**	**0**	**0**	0.272	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.272		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.272		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.283		
CV.1se	**0**	**0**	**0**	1.246	**0**	
CV.min	**0**	**0**	**0**	1.276	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	1.266		$\rho = 0$
AIC	0.010	0.010	0.013	1.313		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.267		
CV.1se	**0**	**0**	**0**	1.118	**0**	
CV.min	**0**	**0**	**0**	1.146	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	1.135		$\rho = 0.5$
AIC	0.009	0.010	0.011	1.181		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.142		
CV.1se	**0**	**0**	**0**	1.063	**0**	
CV.min	**0**	**0**	**0**	1.084	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	1.078		$\rho = 0.9$
AIC	0.008	0.009	0.010	1.114		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.086		
CV.1se	**0**	**0**	**0**	4.898	**0**	
CV.min	**0**	**0**	**0**	5.206	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.002	5.082		$\rho = 0$
AIC	0.049	0.060	0.124	6.067		$Oracle$: 0.000
BIC	**0**	**0**	**0**	4.957		
CV.1se	**0**	**0**	**0**	4.397	**0**	
CV.min	**0**	**0**	**0**	4.670	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.002	4.553		$\rho = 0.5$
AIC	0.044	0.053	0.106	5.446		$Oracle$: 0.000
BIC	**0**	**0**	**0**	4.461		
CV.1se	**0**	**0**	**0**	4.172	**0**	
CV.min	**0**	**0**	**0**	4.403	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.002	4.312		$\rho = 0.9$
AIC	0.038	0.046	0.093	5.080		$Oracle$: 0.000
BIC	**0**	**0**	**0**	4.236		

Table 45: **Estimation MSE for n=1000, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	2.042	**0**	
CV.min	**0**	**0**	**0**	1.974	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.981		$\rho = 0$
AIC	0.011	0.011	0.020	1.981		$Oracle$: 0.000
BIC	0.007	0.002	0.001	2.289		
CV.1se	**0**	**0**	**0**	1.853	**0**	
CV.min	**0**	**0**	**0**	1.786	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.795		$\rho = 0.5$
AIC	0.010	0.011	0.017	1.790		$Oracle$: 0.000
BIC	0.008	0.003	**0**	2.120		
CV.1se	**0**	**0**	**0**	1.762	**0**	
CV.min	**0**	**0**	**0**	1.693	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.704		$\rho = 0.9$
AIC	0.010	0.010	0.015	1.694		$Oracle$: 0.000
BIC	0.008	0.003	**0**	2.016		
CV.1se	**0.01**	**0.01**	0.012	7.615	**0.01**	
CV.min	**0.01**	**0.01**	0.011	7.637	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.017	7.579		$\rho = 0$
AIC	0.064	0.079	0.163	8.292		$Oracle$: 0.001
BIC	0.017	0.014	0.017	8.587		
CV.1se	**0.01**	**0.01**	0.011	6.857	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	6.868	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.014	6.823		$\rho = 0.5$
AIC	0.056	0.069	0.139	7.467		$Oracle$: 0.000
BIC	0.018	0.015	0.017	7.855		
CV.1se	**0.01**	**0.01**	0.011	6.509	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	6.486	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.013	6.456		$\rho = 0.9$
AIC	0.050	0.061	0.123	6.992		$Oracle$: 0.000
BIC	0.019	0.016	0.017	7.492		
CV.1se	**0.02**	**0.02**	**0.02**	28.325	**0.02**	
CV.min	**0.02**	**0.02**	0.022	29.614	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	0.022	0.041	28.920		$\rho = 0$
AIC	0.359	0.530	1.206	35.888		$Oracle$: 0.012
BIC	**0.02**	**0.02**	**0.02**	29.717		
CV.1se	**0.02**	**0.02**	**0.02**	25.373	**0.02**	
CV.min	**0.02**	**0.02**	0.021	26.519	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	0.021	0.043	25.885		$\rho = 0.5$
AIC	0.313	0.454	1.013	32.212		$Oracle$: 0.011
BIC	**0.02**	**0.02**	**0.02**	26.501		
CV.1se	**0.02**	**0.02**	**0.02**	24.000	**0.02**	
CV.min	**0.02**	**0.02**	0.021	24.954	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	0.021	0.037	24.431		$\rho = 0.9$
AIC	0.276	0.399	0.889	30.063		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	24.987		

Table 46: **Estimation MSE for n=1000, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.010	0.007	0.002	3.649	0.002	
CV.min	0.008	0.004	**0.001**	3.533	**0.001**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.009	0.004	0.002	3.552		$\rho = 0$
AIC	0.022	0.024	0.044	3.574		$Oracle$: 0.000
BIC	0.010	0.010	0.006	4.076		
CV.1se	0.010	0.007	0.001	3.315	0.001	
CV.min	0.008	0.003	**0**	3.202	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.003	0.002	3.227		$\rho = 0.5$
AIC	0.019	0.022	0.038	3.229		$Oracle$: 0.000
BIC	0.011	0.010	0.004	3.784		
CV.1se	0.010	0.006	0.001	3.162	**0**	
CV.min	0.008	0.002	**0**	3.044	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.009	0.003	0.001	3.070		$\rho = 0.9$
AIC	0.017	0.020	0.034	3.060		$Oracle$: 0.000
BIC	0.011	0.010	0.004	3.628		
CV.1se	0.023	0.024	0.033	14.138	0.022	
CV.min	**0.021**	**0.021**	0.028	14.068	**0.021**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.021**	**0.021**	0.038	14.009		$\rho = 0$
AIC	0.126	0.166	0.354	15.342		$Oracle$: 0.007
BIC	0.040	0.038	0.040	17.915		
CV.1se	0.024	0.024	0.032	12.775	0.022	
CV.min	**0.02**	**0.02**	0.026	12.685	**0.02**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.021	**0.02**	0.033	12.655		$\rho = 0.5$
AIC	0.111	0.145	0.302	13.777		$Oracle$: 0.004
BIC	0.040	0.039	0.040	16.729		
CV.1se	0.024	0.024	0.031	12.135	0.022	
CV.min	**0.02**	**0.02**	0.025	11.995	**0.02**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.02**	**0.02**	0.031	11.980		$\rho = 0.9$
AIC	0.098	0.128	0.267	12.956		$Oracle$: 0.003
BIC	0.040	0.039	0.040	16.045		
CV.1se	0.040	0.040	0.040	51.327	0.040	
CV.min	0.040	0.041	0.042	53.535	0.040	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.039**	0.051	0.071	52.266		$\rho = 0$
AIC	0.669	1.078	2.446	65.105		$Oracle$: 0.024
BIC	0.040	0.040	0.040	53.281		
CV.1se	**0.04**	**0.04**	**0.04**	45.907	**0.04**	
CV.min	**0.04**	0.041	0.041	47.883	**0.04**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.04**	0.047	0.073	46.753		$\rho = 0.5$
AIC	0.584	0.918	2.046	58.347		$Oracle$: 0.021
BIC	**0.04**	**0.04**	**0.04**	47.401		
CV.1se	**0.04**	**0.04**	**0.04**	43.426	**0.04**	
CV.min	**0.04**	**0.04**	0.041	45.137	**0.04**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.04**	0.046	0.064	44.127		$\rho = 0.9$
AIC	0.511	0.804	1.800	54.507		$Oracle$: 0.019
BIC	**0.04**	**0.04**	**0.04**	44.686		

Table 47: **Estimation MSE for n=1000, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.010	0.010	0.002	5.285	**0.001**	
CV.min	0.010	0.009	0.002	5.132	**0.001**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.009	0.004	5.157		$\rho = 0$
AIC	0.033	0.038	0.073	5.239		$Oracle$: 0.000
BIC	0.014	0.010	0.007	5.743		
CV.1se	0.010	0.010	0.001	4.808	0.001	
CV.min	0.010	0.009	0.001	4.658	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.010	0.002	4.688		$\rho = 0.5$
AIC	0.029	0.033	0.062	4.733		$Oracle$: 0.000
BIC	0.015	0.010	0.005	5.306		
CV.1se	0.010	0.010	0.001	4.588	**0**	
CV.min	0.010	0.009	0.001	4.433	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.009	0.002	4.466		$\rho = 0.9$
AIC	0.026	0.030	0.055	4.489		$Oracle$: 0.000
BIC	0.015	0.010	0.005	5.083		
CV.1se	0.038	0.041	0.056	21.085	0.036	
CV.min	**0.031**	0.033	0.050	20.917	**0.031**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.032	0.033	0.063	20.861		$\rho = 0$
AIC	0.193	0.267	0.579	22.850		$Oracle$: 0.010
BIC	0.060	0.059	0.060	28.864		
CV.1se	0.039	0.040	0.055	19.070	0.037	
CV.min	**0.031**	0.032	0.047	18.874	**0.031**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.033	0.032	0.055	18.858		$\rho = 0.5$
AIC	0.170	0.232	0.491	20.495		$Oracle$: 0.010
BIC	0.060	0.060	0.060	26.477		
CV.1se	0.038	0.040	0.054	18.124	0.036	
CV.min	**0.031**	**0.031**	0.046	17.859	**0.031**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.033	**0.031**	0.050	17.873		$\rho = 0.9$
AIC	0.150	0.203	0.432	19.273		$Oracle$: 0.010
BIC	0.060	0.060	0.060	25.202		
CV.1se	0.060	0.060	0.060	75.904	0.060	
CV.min	**0.059**	0.062	0.062	79.163	**0.059**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.059**	0.086	0.090	77.225		$\rho = 0$
AIC	0.997	1.708	3.825	96.438		$Oracle$: 0.035
BIC	0.060	0.060	0.060	78.420		
CV.1se	**0.06**	**0.06**	**0.06**	67.803	**0.06**	
CV.min	**0.06**	0.061	0.062	70.692	**0.06**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.06**	0.079	0.092	68.967		$\rho = 0.5$
AIC	0.871	1.455	3.226	86.201		$Oracle$: 0.030
BIC	**0.06**	**0.06**	**0.06**	69.642		
CV.1se	0.060	0.060	0.060	64.208	0.060	
CV.min	0.060	0.061	0.061	66.746	0.060	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.059**	0.076	0.087	65.228		$\rho = 0.9$
AIC	0.761	1.270	2.828	80.641		$Oracle$: 0.027
BIC	0.060	0.060	0.060	65.755		

Table 48: **Estimation MSE for n=1000, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	1.314	**0**	
CV.min	**0**	**0**	**0**	1.272	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.273		$\rho = 0$
AIC	**0**	**0**	**0**	1.272		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.318		
CV.1se	**0**	**0**	**0**	0.610	**0**	
CV.min	**0**	**0**	**0**	0.586	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.587		$\rho = 0.5$
AIC	**0**	**0**	**0**	0.586		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.606		
CV.1se	**0**	**0**	**0**	0.174	**0**	
CV.min	**0**	**0**	**0**	0.167	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.167		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.167		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.167		
CV.1se	**0**	**0**	**0**	5.004	**0**	
CV.min	**0**	**0**	**0**	5.133	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	5.083		$\rho = 0$
AIC	0.010	0.010	0.010	5.277		$Oracle$: 0.000
BIC	**0**	**0**	**0**	5.094		
CV.1se	**0**	**0**	**0**	2.083	**0**	
CV.min	**0**	**0**	**0**	2.069	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	2.064		$\rho = 0.5$
AIC	**0**	**0**	0.001	2.074		$Oracle$: 0.000
BIC	**0**	**0**	0	2.230		
CV.1se	**0**	**0**	**0**	0.544	**0**	
CV.min	**0**	**0**	**0**	0.523	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	0.523		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.523		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.537		
CV.1se	**0**	**0**	**0**	19.703	**0**	
CV.min	**0**	**0**	**0**	20.924	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	**0**	20.419		$\rho = 0$
AIC	0.040	0.048	0.099	24.311		$Oracle$: 0.000
BIC	**0**	**0**	**0**	19.918		
CV.1se	**0**	**0**	**0**	7.936	**0**	
CV.min	**0**	**0**	**0**	8.190	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	**0**	8.099		$\rho = 0.5$
AIC	0.019	0.021	0.042	8.896		$Oracle$: 0.000
BIC	**0**	**0**	**0**	8.117		
CV.1se	**0**	**0**	**0**	2.049	**0**	
CV.min	**0**	**0**	**0**	2.022	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	**0**	2.025		$\rho = 0.9$
AIC	0.009	0.010	0.019	2.033		$Oracle$: 0.000
BIC	**0**	**0**	**0**	2.065		

Table 49: **Estimation MSE for n=1000, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	8.189	**0**	
CV.min	**0**	**0**	**0**	7.919	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	7.948		$\rho = 0$
AIC	0.010	0.010	0.016	7.945		$Oracle$: 0.000
BIC	0.006	0.002	0.002	9.162		
CV.1se	0.002	**0**	**0**	3.630	**0**	
CV.min	**0**	**0**	**0**	3.381	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.002	**0**	**0**	3.442		$\rho = 0.5$
AIC	0.001	0.001	0.009	3.355		$Oracle$: 0.000
BIC	0.015	0.010	0.003	5.182		
CV.1se	0.006	0.002	**0**	1.143	**0**	
CV.min	**0**	**0**	**0**	1.075	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.007	0.002	**0**	1.076		$\rho = 0.9$
AIC	**0**	**0**	**0**	1.076		$Oracle$: 0.000
BIC	0.020	0.020	0.019	1.215		
CV.1se	**0.01**	**0.01**	0.011	30.539	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	30.640	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.011	30.396		$\rho = 0$
AIC	0.051	0.063	0.129	33.232		$Oracle$: 0.000
BIC	0.017	0.016	0.020	34.514		
CV.1se	0.016	0.013	0.013	12.367	**0.01**	
CV.min	**0.01**	**0.01**	0.011	11.947	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.011	**0.01**	**0.01**	12.032		$\rho = 0.5$
AIC	0.025	0.029	0.057	12.162		$Oracle$: 0.000
BIC	0.020	0.020	0.020	15.925		
CV.1se	0.020	0.018	0.017	2.460	0.012	
CV.min	0.017	0.014	0.014	2.310	0.011	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.019	0.017	0.016	2.312		$\rho = 0.9$
AIC	**0.01**	**0.01**	0.016	2.303		$Oracle$: 0.000
BIC	0.020	0.020	0.020	2.746		
CV.1se	**0.02**	**0.02**	**0.02**	113.819	**0.02**	
CV.min	**0.02**	**0.02**	0.021	118.880	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	**0.02**	**0.02**	116.011		$\rho = 0$
AIC	0.285	0.420	0.948	143.937		$Oracle$: 0.010
BIC	**0.02**	**0.02**	**0.02**	119.474		
CV.1se	**0.02**	**0.02**	**0.02**	40.987	**0.02**	
CV.min	**0.02**	**0.02**	**0.02**	42.254	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	**0.02**	**0.02**	41.712		$\rho = 0.5$
AIC	0.141	0.192	0.422	49.755		$Oracle$: 0.009
BIC	**0.02**	**0.02**	**0.02**	41.303		
CV.1se	**0.02**	**0.02**	**0.02**	7.500	**0.02**	
CV.min	**0.02**	**0.02**	**0.02**	7.406	**0.02**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.02**	**0.02**	**0.02**	7.422		$\rho = 0.9$
AIC	0.048	0.063	0.147	7.504		$Oracle$: 0.009
BIC	**0.02**	**0.02**	**0.02**	7.383		

Table 50: **Estimation MSE for n=1000, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.010	0.005	0.001	14.641	**0**	
CV.min	0.007	0.001	**0**	14.173	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.009	0.002	**0**	14.250		$\rho = 0$
AIC	0.018	0.020	0.035	14.326		$Oracle$: 0.000
BIC	0.010	0.010	0.005	16.271		
CV.1se	0.010	0.007	**0**	6.671	**0**	
CV.min	0.008	0.001	**0**	6.102	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.007	**0**	6.348		$\rho = 0.5$
AIC	0.010	0.010	0.015	5.976		$Oracle$: 0.000
BIC	0.040	0.039	0.004	16.698		
CV.1se	0.010	0.009	0.001	2.237	0.001	
CV.min	0.010	0.003	**0**	2.013	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.010	**0**	2.022		$\rho = 0.9$
AIC	0.010	0.002	**0**	2.010		$Oracle$: 0.000
BIC	0.040	0.040	0.040	2.821		
CV.1se	0.022	0.023	0.030	56.693	0.021	
CV.min	**0.02**	**0.02**	0.024	56.464	**0.02**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.02**	**0.02**	0.027	56.219		$\rho = 0$
AIC	0.101	0.133	0.281	61.526		$Oracle$: 0.004
BIC	0.040	0.040	0.040	71.760		
CV.1se	0.037	0.033	0.038	23.253	0.028	
CV.min	0.025	0.023	0.034	22.171	0.022	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.030	0.024	**0.02**	22.503		$\rho = 0.5$
AIC	0.052	0.064	0.128	22.379		$Oracle$: 0.000
BIC	0.040	0.040	0.040	28.805		
CV.1se	0.040	0.040	0.040	4.611	0.038	
CV.min	0.040	0.038	0.040	4.251	0.033	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.040	0.040	0.039	4.227		$\rho = 0.9$
AIC	**0.02**	0.021	0.039	4.113		$Oracle$: 0.000
BIC	0.040	0.040	0.040	4.810		
CV.1se	0.040	0.040	0.040	206.405	0.040	
CV.min	0.039	0.040	0.041	215.140	0.039	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.038**	0.041	0.041	209.877		$\rho = 0$
AIC	0.533	0.854	1.927	261.313		$Oracle$: 0.020
BIC	0.040	0.040	0.077	214.307		
CV.1se	**0.04**	**0.04**	**0.04**	72.558	**0.04**	
CV.min	**0.04**	**0.04**	**0.04**	74.881	**0.04**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.04**	**0.04**	**0.04**	73.917		$\rho = 0.5$
AIC	0.259	0.381	0.851	89.410		$Oracle$: 0.010
BIC	**0.04**	**0.04**	**0.04**	72.874		
CV.1se	**0.04**	**0.04**	**0.04**	12.668	**0.04**	
CV.min	**0.04**	**0.04**	**0.04**	12.572	**0.04**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.04**	**0.04**	**0.04**	12.607		$\rho = 0.9$
AIC	0.102	0.144	0.330	12.810		$Oracle$: 0.010
BIC	**0.04**	**0.04**	**0.04**	12.542		

Table 51: **Estimation MSE for n=1000, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.010	0.010	0.001	21.213	**0**	
CV.min	0.010	0.009	**0**	20.593	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.009	0.002	20.694		$\rho = 0$
AIC	0.027	0.031	0.058	21.019		$Oracle$: 0.000
BIC	0.013	0.010	0.006	23.085		
CV.1se	0.010	0.010	**0**	9.770	**0**	
CV.min	0.010	0.008	**0**	8.912	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.011	0.010	**0**	9.342		$\rho = 0.5$
AIC	0.012	0.014	0.025	8.684		$Oracle$: 0.000
BIC	0.060	0.056	0.001	25.915		
CV.1se	0.011	0.010	**0**	3.342	**0**	
CV.min	0.010	0.008	**0**	2.877	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.014	0.010	**0**	2.898		$\rho = 0.9$
AIC	0.010	0.008	0.008	2.843		$Oracle$: 0.000
BIC	0.060	0.060	0.044	4.207		
CV.1se	0.035	0.038	0.052	84.516	0.033	
CV.min	**0.029**	0.030	0.043	83.894	**0.029**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.030	0.030	0.046	83.679		$\rho = 0$
AIC	0.155	0.214	0.460	91.688		$Oracle$: 0.010
BIC	0.060	0.060	0.060	116.109		
CV.1se	0.058	0.056	0.060	35.001	0.054	
CV.min	0.044	0.043	0.059	33.181	0.042	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.051	0.040	**0.033**	33.805		$\rho = 0.5$
AIC	0.081	0.103	0.211	33.234		$Oracle$: 0.001
BIC	0.060	0.060	0.060	42.426		
CV.1se	0.060	0.060	0.060	6.958	0.060	
CV.min	0.060	0.060	0.060	6.412	0.059	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.060	0.060	0.059	6.353		$\rho = 0.9$
AIC	**0.034**	0.037	0.070	5.966		$Oracle$: 0.001
BIC	0.060	0.060	0.060	7.008		
CV.1se	0.060	0.060	0.060	304.998	0.060	
CV.min	0.058	0.061	0.062	317.792	0.058	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.057**	0.063	0.060	309.999		$\rho = 0$
AIC	0.794	1.354	3.025	386.824		$Oracle$: 0.028
BIC	0.060	0.060	0.633	315.022		
CV.1se	**0.06**	**0.06**	**0.06**	106.431	**0.06**	
CV.min	**0.06**	**0.06**	**0.06**	109.886	**0.06**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.06**	**0.06**	**0.06**	108.443		$\rho = 0.5$
AIC	0.384	0.595	1.331	131.600		$Oracle$: 0.016
BIC	**0.06**	**0.06**	**0.06**	106.781		
CV.1se	**0.06**	**0.06**	**0.06**	18.284	**0.06**	
CV.min	**0.06**	**0.06**	**0.06**	18.183	**0.06**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.06**	**0.06**	**0.06**	18.231		$\rho = 0.9$
AIC	0.163	0.243	0.557	18.642		$Oracle$: 0.016
BIC	**0.06**	**0.06**	**0.06**	18.188		

Table 52: **Estimation MSE for n=100, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	0.526	**0**	
CV.min	**0**	**0**	**0**	0.504	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	0.003	0.557		$\rho = 0$
AIC	**0**	0.001	0.003	0.523		$Oracle$: 0.000
BIC	**0**	0.001	0.003	0.530		
CV.1se	**0**	**0**	**0**	0.485	**0**	
CV.min	**0**	**0**	**0**	0.458	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	0.002	0.520		$\rho = 0.5$
AIC	**0**	**0**	0.003	0.471		$Oracle$: 0.000
BIC	**0**	**0**	0.003	0.478		
CV.1se	**0**	**0**	**0**	0.472	**0**	
CV.min	**0**	**0**	**0**	0.438	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	0.002	0.505		$\rho = 0.9$
AIC	**0**	0.001	0.002	0.449		$Oracle$: 0.000
BIC	**0**	0.001	0.002	0.457		
CV.1se	**0**	**0**	**0**	1.794	**0**	
CV.min	0.001	0.001	0.001	2.032	0.001	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	0.003	0.012	1.729		$\rho = 0$
AIC	0.009	0.010	0.012	2.151		$Oracle$: 0.000
BIC	0.009	0.010	0.012	2.148		
CV.1se	**0**	**0**	**0**	1.635	**0**	
CV.min	**0**	0.001	0.001	1.831	0.001	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	0.002	0.011	1.573		$\rho = 0.5$
AIC	0.008	0.010	0.011	1.930		$Oracle$: 0.000
BIC	0.008	0.010	0.011	1.927		
CV.1se	**0**	**0**	**0**	1.545	**0**	
CV.min	0.001	0.001	0.001	1.724	0.001	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	0.001	0.011	1.501		$\rho = 0.9$
AIC	0.009	0.010	0.011	1.828		$Oracle$: 0.000
BIC	0.009	0.010	0.011	1.824		
CV.1se	**0**	**0**	**0**	6.910	**0**	
CV.min	0.002	0.002	0.001	8.222	0.003	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.003	0.014	0.035	6.009		$\rho = 0$
AIC	0.014	0.023	0.036	8.741		$Oracle$: 0.002
BIC	0.014	0.023	0.036	8.737		
CV.1se	**0**	**0**	**0**	6.196	**0**	
CV.min	0.002	0.002	0.001	7.376	0.003	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.003	0.012	0.032	5.391		$\rho = 0.5$
AIC	0.013	0.021	0.032	7.792		$Oracle$: 0.002
BIC	0.013	0.021	0.032	7.788		
CV.1se	**0**	**0**	**0**	5.855	**0**	
CV.min	0.002	0.002	0.001	6.969	0.003	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.003	0.011	0.031	5.154		$\rho = 0.9$
AIC	0.013	0.020	0.031	7.417		$Oracle$: 0.001
BIC	0.013	0.020	0.031	7.409		

Table 53: **Estimation MSE for n=100, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.02**	0.021	0.021	3.271	0.021	
CV.min	0.022	0.023	0.022	2.949	0.024	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.022	0.037	0.059	4.316		$\rho = 0$
AIC	0.032	0.042	0.059	2.944		$Oracle$: 0.026
BIC	0.032	0.042	0.059	2.943		
CV.1se	**0.02**	0.021	0.021	2.960	0.021	
CV.min	0.022	0.022	0.022	2.638	0.023	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.022	0.035	0.055	3.860		$\rho = 0.5$
AIC	0.032	0.041	0.055	2.633		$Oracle$: 0.022
BIC	0.032	0.041	0.055	2.632		
CV.1se	**0.02**	**0.02**	**0.02**	2.894	**0.02**	
CV.min	0.022	0.022	0.022	2.504	0.023	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.021	0.033	0.054	3.772		$\rho = 0.9$
AIC	0.032	0.039	0.054	2.486		$Oracle$: 0.021
BIC	0.032	0.039	0.054	2.487		
CV.1se	**0.021**	**0.021**	**0.021**	10.258	**0.021**	
CV.min	0.024	0.023	0.022	11.337	0.024	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.024	0.057	0.092	10.122		$\rho = 0$
AIC	0.043	0.064	0.092	11.795		$Oracle$: 0.031
BIC	0.043	0.064	0.092	11.790		
CV.1se	**0.021**	**0.021**	**0.021**	9.188	**0.021**	
CV.min	0.024	0.023	0.022	10.122	0.024	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.024	0.053	0.085	9.087		$\rho = 0.5$
AIC	0.042	0.060	0.085	10.520		$Oracle$: 0.029
BIC	0.042	0.060	0.085	10.516		
CV.1se	**0.021**	**0.021**	**0.021**	8.725	**0.021**	
CV.min	0.023	0.022	0.022	9.513	0.024	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.023	0.050	0.079	8.655		$\rho = 0.9$
AIC	0.041	0.057	0.079	9.933		$Oracle$: 0.026
BIC	0.041	0.057	0.079	9.929		
CV.1se	**0.022**	**0.022**	0.023	37.726	0.023	
CV.min	0.026	0.025	0.025	44.850	0.027	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.027	0.144	0.217	32.632		$\rho = 0$
AIC	0.084	0.153	0.217	47.153		$Oracle$: 0.039
BIC	0.084	0.153	0.217	47.137		
CV.1se	**0.022**	**0.022**	**0.022**	33.791	**0.022**	
CV.min	0.026	0.024	0.024	39.934	0.026	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.026	0.131	0.196	29.173		$\rho = 0.5$
AIC	0.078	0.140	0.196	42.191		$Oracle$: 0.037
BIC	0.078	0.140	0.196	42.173		
CV.1se	**0.022**	**0.022**	**0.022**	31.349	**0.022**	
CV.min	0.026	0.024	0.024	37.309	0.027	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.026	0.122	0.188	27.516		$\rho = 0.9$
AIC	0.077	0.131	0.188	39.711		$Oracle$: 0.034
BIC	0.077	0.131	0.188	39.694		

Table 54: **Estimation MSE for n=100, binary design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.05**	**0.05**	**0.05**	6.717	**0.05**	
CV.min	0.051	0.052	0.051	6.017	0.052	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.05**	0.091	0.130	9.026		$\rho = 0$
AIC	0.068	0.096	0.130	5.986		$Oracle$: 296.861
BIC	0.068	0.096	0.130	5.984		
CV.1se	**0.05**	**0.05**	**0.05**	6.066	**0.05**	
CV.min	0.051	0.051	0.051	5.381	0.052	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.05**	0.084	0.121	8.156		$\rho = 0.5$
AIC	0.067	0.090	0.121	5.337		$Oracle$: 6.607
BIC	0.067	0.090	0.121	5.335		
CV.1se	**0.05**	**0.05**	**0.05**	5.905	**0.05**	
CV.min	0.051	0.051	0.051	5.100	0.052	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.05**	0.082	0.116	7.866		$\rho = 0.9$
AIC	0.066	0.088	0.116	5.030		$Oracle$: 8.065
BIC	0.066	0.088	0.116	5.029		
CV.1se	**0.05**	**0.05**	**0.05**	20.893	**0.05**	
CV.min	0.052	0.052	0.052	22.993	0.053	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.051	0.133	0.194	20.644		$\rho = 0$
AIC	0.088	0.141	0.194	23.877		$Oracle$: 0.122
BIC	0.088	0.141	0.194	23.868		
CV.1se	**0.05**	**0.05**	**0.05**	18.668	**0.05**	
CV.min	0.052	0.052	0.051	20.455	0.053	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.051	0.124	0.180	18.486		$\rho = 0.5$
AIC	0.086	0.131	0.181	21.260		$Oracle$: 0.100
BIC	0.086	0.131	0.181	21.249		
CV.1se	**0.05**	**0.05**	**0.05**	17.702	**0.05**	
CV.min	0.052	0.052	0.052	19.251	0.053	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.051	0.118	0.168	17.562		$\rho = 0.9$
AIC	0.084	0.126	0.168	20.094		$Oracle$: 0.099
BIC	0.084	0.126	0.168	20.083		
CV.1se	**0.05**	**0.05**	0.051	76.347	**0.05**	
CV.min	0.055	0.054	0.054	90.392	0.057	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.054	0.322	0.461	66.067		$\rho = 0$
AIC	0.170	0.334	0.462	95.261		$Oracle$: 0.080
BIC	0.170	0.334	0.462	95.227		
CV.1se	**0.05**	**0.05**	**0.05**	68.388	**0.05**	
CV.min	0.054	0.054	0.053	80.836	0.056	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.054	0.288	0.411	58.981		$\rho = 0.5$
AIC	0.158	0.299	0.412	85.029		$Oracle$: 0.078
BIC	0.158	0.299	0.412	84.994		
CV.1se	**0.05**	**0.05**	0.051	63.175	**0.05**	
CV.min	0.055	0.054	0.054	75.478	0.056	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.054	0.271	0.391	55.779		$\rho = 0.9$
AIC	0.155	0.283	0.392	80.331		$Oracle$: 0.073
BIC	0.155	0.283	0.392	80.236		

Table 55: **Estimation MSE for n=100, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.1**	**0.1**	**0.1**	13.601	**0.1**	
CV.min	0.103	0.103	0.103	12.016	0.105	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.101	0.199	0.273	18.227		$\rho = 0$
AIC	0.140	0.205	0.273	11.966		$Oracle$: 3349.772
BIC	0.140	0.205	0.273	11.962		
CV.1se	**0.1**	**0.1**	**0.1**	12.342	**0.1**	
CV.min	0.102	0.102	0.102	10.791	0.103	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.101	0.188	0.257	16.688		$\rho = 0.5$
AIC	0.138	0.195	0.258	10.703		$Oracle$: 1995.095
BIC	0.138	0.195	0.258	10.700		
CV.1se	**0.1**	**0.1**	**0.1**	11.951	**0.1**	
CV.min	0.102	0.102	0.102	10.239	0.103	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.101	0.182	0.241	15.861		$\rho = 0.9$
AIC	0.136	0.188	0.242	10.121		$Oracle$: 353.306
BIC	0.136	0.188	0.242	10.119		
CV.1se	**0.1**	**0.1**	**0.1**	42.180	**0.1**	
CV.min	0.105	0.104	0.104	46.230	0.106	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.103	0.294	0.404	41.661		$\rho = 0$
AIC	0.180	0.303	0.404	47.906		$Oracle$: 1.151
BIC	0.180	0.303	0.404	47.889		
CV.1se	**0.1**	**0.1**	0.101	37.519	**0.1**	
CV.min	0.104	0.104	0.103	41.164	0.106	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.103	0.275	0.375	37.226		$\rho = 0.5$
AIC	0.175	0.283	0.375	42.685		$Oracle$: 0.666
BIC	0.175	0.283	0.375	42.673		
CV.1se	**0.1**	**0.1**	**0.1**	35.715	**0.1**	
CV.min	0.104	0.104	0.103	38.820	0.106	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.103	0.259	0.355	35.322		$\rho = 0.9$
AIC	0.172	0.268	0.355	40.488		$Oracle$: 0.941
BIC	0.172	0.268	0.355	40.475		
CV.1se	**0.101**	**0.101**	**0.101**	154.796	**0.101**	
CV.min	0.111	0.108	0.109	182.987	0.115	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.110	0.716	0.957	133.295		$\rho = 0$
AIC	0.342	0.728	0.957	192.590		$Oracle$: 0.159
BIC	0.341	0.728	0.957	192.499		
CV.1se	**0.101**	**0.101**	**0.101**	136.826	**0.101**	
CV.min	0.109	0.108	0.107	162.564	0.114	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.109	0.638	0.846	118.647		$\rho = 0.5$
AIC	0.320	0.652	0.846	171.265		$Oracle$: 0.156
BIC	0.320	0.652	0.846	171.200		
CV.1se	**0.101**	**0.101**	**0.101**	127.348	**0.101**	
CV.min	0.110	0.108	0.107	151.934	0.114	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.109	0.596	0.799	112.301		$\rho = 0.9$
AIC	0.316	0.611	0.799	161.486		$Oracle$: 0.147
BIC	0.315	0.611	0.799	161.418		

Table 56: **Estimation MSE for n=100, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	2.108	**0**	
CV.min	**0**	**0**	**0**	2.030	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	0.002	2.237		$\rho = 0$
AIC	**0**	**0**	0.002	2.101		$Oracle$: 0.000
BIC	**0**	**0**	0.002	2.146		
CV.1se	**0**	**0**	**0**	1.037	**0**	
CV.min	**0**	**0**	**0**	0.843	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	0.002	1.166		$\rho = 0.5$
AIC	**0**	**0**	0.002	0.814		$Oracle$: 0.000
BIC	**0**	**0**	0.002	0.907		
CV.1se	**0**	**0**	**0**	0.289	**0**	
CV.min	**0**	**0**	**0**	0.222	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.247		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.199		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.316		
CV.1se	**0**	**0**	**0**	7.245	**0**	
CV.min	**0**	0.001	0.001	8.172	0.001	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	0.010	6.939		$\rho = 0$
AIC	0.008	0.010	0.010	8.655		$Oracle$: 0.000
BIC	0.008	0.010	0.010	8.634		
CV.1se	**0**	**0**	**0**	2.827	**0**	
CV.min	**0**	**0**	**0**	3.070	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	0.009	2.782		$\rho = 0.5$
AIC	0.006	0.008	0.010	3.273		$Oracle$: 0.000
BIC	0.006	0.008	0.010	3.264		
CV.1se	**0**	**0**	**0**	0.717	**0**	
CV.min	**0**	**0**	**0**	0.696	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	0.682		$\rho = 0.9$
AIC	**0**	0.001	0.004	0.805		$Oracle$: 0.000
BIC	**0**	0.001	0.004	0.700		
CV.1se	**0.001**	**0.001**	**0.001**	27.723	**0.001**	
CV.min	0.003	0.002	0.002	33.054	0.003	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.003	0.005	0.031	24.010		$\rho = 0$
AIC	0.012	0.020	0.031	35.085		$Oracle$: 0.001
BIC	0.012	0.020	0.031	35.070		
CV.1se	**0**	**0**	**0**	10.083	**0**	
CV.min	0.001	0.001	0.001	12.084	0.001	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.001	**0**	0.013	9.107		$\rho = 0.5$
AIC	0.010	0.010	0.013	13.175		$Oracle$: 0.000
BIC	0.010	0.010	0.013	13.156		
CV.1se	**0**	**0**	**0**	2.291	**0**	
CV.min	**0**	**0**	**0**	2.528	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.006	2.341		$\rho = 0.9$
AIC	0.010	0.010	0.010	3.436		$Oracle$: 0.001
BIC	0.010	0.010	0.010	2.661		

Table 57: **Estimation MSE for n=100, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.022**	**0.022**	**0.022**	13.270	**0.022**	
CV.min	0.023	0.023	0.023	11.890	0.023	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.022**	0.028	0.052	17.111		$\rho = 0$
AIC	0.030	0.039	0.052	11.862		$Oracle$: 0.021
BIC	0.030	0.039	0.052	11.857		
CV.1se	**0.02**	**0.02**	**0.02**	5.378	**0.02**	
CV.min	0.021	0.021	0.021	4.240	0.021	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.021	0.021	0.034	6.623		$\rho = 0.5$
AIC	0.030	0.030	0.034	4.065		$Oracle$: 0.014
BIC	0.030	0.030	0.034	4.064		
CV.1se	**0.02**	**0.02**	**0.02**	1.542	**0.02**	
CV.min	**0.02**	**0.02**	**0.02**	1.121	**0.02**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.02**	**0.02**	0.024	1.262		$\rho = 0.9$
AIC	0.023	0.026	0.029	0.737		$Oracle$: 0.013
BIC	0.023	0.026	0.029	1.378		
CV.1se	**0.023**	**0.023**	**0.023**	41.467	**0.023**	
CV.min	0.025	0.025	0.024	45.677	0.026	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.025	0.042	0.080	40.704		$\rho = 0$
AIC	0.039	0.057	0.080	47.412		$Oracle$: 0.027
BIC	0.039	0.057	0.080	47.393		
CV.1se	**0.021**	**0.021**	**0.021**	14.363	**0.021**	
CV.min	0.022	0.022	**0.021**	15.423	0.022	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.022	0.022	0.043	14.342		$\rho = 0.5$
AIC	0.030	0.035	0.043	16.291		$Oracle$: 0.019
BIC	0.030	0.035	0.043	16.279		
CV.1se	**0.02**	**0.02**	**0.02**	2.822	**0.02**	
CV.min	**0.02**	**0.02**	**0.02**	2.616	**0.02**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.02**	**0.02**	0.028	2.648		$\rho = 0.9$
AIC	0.029	0.030	0.030	2.884		$Oracle$: 0.019
BIC	0.029	0.030	0.030	2.875		
CV.1se	**0.025**	**0.025**	0.026	151.728	0.026	
CV.min	0.028	0.027	0.027	180.429	0.029	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.028	0.121	0.188	131.418		$\rho = 0$
AIC	0.074	0.134	0.188	190.125		$Oracle$: 0.037
BIC	0.074	0.133	0.188	190.049		
CV.1se	**0.023**	**0.023**	**0.023**	49.491	**0.023**	
CV.min	0.025	0.024	**0.023**	59.331	0.025	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.025	0.038	0.080	44.999		$\rho = 0.5$
AIC	0.042	0.059	0.080	64.967		$Oracle$: 0.027
BIC	0.042	0.059	0.080	64.933		
CV.1se	**0.02**	**0.02**	**0.02**	7.840	**0.02**	
CV.min	0.021	0.021	0.021	8.639	0.021	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.021	**0.02**	0.039	8.095		$\rho = 0.9$
AIC	0.030	0.033	0.039	11.561		$Oracle$: 0.025
BIC	0.030	0.033	0.039	10.161		

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

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.05**	**0.05**	**0.05**	27.338	**0.05**	
CV.min	0.051	0.051	0.051	24.187	0.052	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.05**	0.075	0.114	36.340		$\rho = 0$
AIC	0.063	0.087	0.114	24.103		$Oracle$: 26.263
BIC	0.063	0.087	0.114	24.111		
CV.1se	**0.05**	**0.05**	**0.05**	10.857	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	8.558	**0.05**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.05**	0.051	0.072	13.377		$\rho = 0.5$
AIC	0.055	0.061	0.072	8.167		$Oracle$: 15.203
BIC	0.055	0.061	0.072	8.199		
CV.1se	**0.05**	**0.05**	**0.05**	3.000	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	2.161	**0.05**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.05**	**0.05**	0.052	2.478		$\rho = 0.9$
AIC	**0.05**	**0.05**	0.053	1.378		$Oracle$: 12.752
BIC	**0.05**	**0.05**	0.053	2.305		
CV.1se	**0.05**	**0.05**	**0.05**	84.513	**0.05**	
CV.min	0.052	0.052	0.052	92.563	0.052	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.051	0.115	0.170	83.668		$\rho = 0$
AIC	0.081	0.126	0.171	96.284		$Oracle$: 0.102
BIC	0.081	0.126	0.171	96.246		
CV.1se	**0.05**	**0.05**	**0.05**	28.764	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	30.846	**0.05**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.05**	0.057	0.091	28.843		$\rho = 0.5$
AIC	0.061	0.074	0.091	32.569		$Oracle$: 0.067
BIC	0.061	0.074	0.091	32.544		
CV.1se	**0.05**	**0.05**	**0.05**	5.390	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	4.976	**0.05**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.05**	**0.05**	0.059	5.058		$\rho = 0.9$
AIC	0.051	0.054	0.059	5.416		$Oracle$: 0.059
BIC	0.051	0.054	0.059	5.438		
CV.1se	**0.052**	**0.052**	**0.052**	308.050	**0.052**	
CV.min	0.056	0.056	0.056	365.357	0.058	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.055	0.279	0.393	267.155		$\rho = 0$
AIC	0.151	0.290	0.394	385.780		$Oracle$: 0.077
BIC	0.151	0.290	0.394	385.622		
CV.1se	**0.05**	**0.05**	**0.05**	99.072	**0.05**	
CV.min	0.051	0.051	0.051	119.313	0.052	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.051	0.107	0.166	90.468		$\rho = 0.5$
AIC	0.086	0.126	0.167	130.265		$Oracle$: 0.061
BIC	0.086	0.126	0.167	130.194		
CV.1se	**0.05**	**0.05**	**0.05**	14.671	**0.05**	
CV.min	**0.05**	**0.05**	**0.05**	16.235	**0.05**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.05**	**0.05**	0.078	15.168		$\rho = 0.9$
AIC	0.061	0.068	0.079	21.678		$Oracle$: 0.059
BIC	0.061	0.068	0.079	18.951		

Table 59: **Estimation MSE for n=100, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0.1**	0.101	0.101	55.658	0.101	
CV.min	0.103	0.103	0.102	48.708	0.104	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.101	0.178	0.240	74.225		$\rho = 0$
AIC	0.131	0.187	0.240	48.499		$Oracle$: 1253.554
BIC	0.131	0.187	0.240	48.485		
CV.1se	**0.1**	**0.1**	**0.1**	21.955	**0.1**	
CV.min	**0.1**	**0.1**	**0.1**	17.187	**0.1**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.1**	0.111	0.148	26.781		$\rho = 0.5$
AIC	0.111	0.127	0.148	16.350		$Oracle$: 708.345
BIC	0.111	0.127	0.148	16.344		
CV.1se	**0.1**	**0.1**	**0.1**	5.936	**0.1**	
CV.min	**0.1**	**0.1**	**0.1**	4.261	**0.1**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.1**	**0.1**	0.109	4.934		$\rho = 0.9$
AIC	**0.1**	0.105	0.110	2.671		$Oracle$: 601.732
BIC	**0.1**	0.105	0.110	4.183		
CV.1se	**0.101**	0.102	0.102	170.765	**0.101**	
CV.min	0.105	0.104	0.104	186.404	0.107	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.103	0.261	0.355	168.740		$\rho = 0$
AIC	0.166	0.269	0.356	193.942		$Oracle$: 21.631
BIC	0.166	0.269	0.356	193.872		
CV.1se	**0.1**	**0.1**	**0.1**	57.518	**0.1**	
CV.min	0.101	0.101	0.101	61.288	0.101	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.1**	0.135	0.186	57.517		$\rho = 0.5$
AIC	0.123	0.153	0.186	64.989		$Oracle$: 13.382
BIC	0.123	0.153	0.186	64.960		
CV.1se	**0.1**	**0.1**	**0.1**	10.467	**0.1**	
CV.min	**0.1**	**0.1**	**0.1**	9.667	**0.1**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.1**	**0.1**	0.119	9.840		$\rho = 0.9$
AIC	0.106	0.111	0.119	10.478		$Oracle$: 13.438
BIC	0.106	0.111	0.119	10.572		
CV.1se	**0.104**	0.105	0.105	621.359	**0.104**	
CV.min	0.113	0.110	0.112	736.801	0.117	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.112	0.608	0.803	536.105		$\rho = 0$
AIC	0.304	0.620	0.808	776.534		$Oracle$: 0.153
BIC	0.304	0.620	0.808	776.223		
CV.1se	**0.101**	**0.101**	**0.101**	197.909	**0.101**	
CV.min	0.103	0.103	0.103	237.902	0.104	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.103	0.251	0.344	181.025		$\rho = 0.5$
AIC	0.173	0.265	0.345	260.223		$Oracle$: 0.124
BIC	0.173	0.265	0.345	260.073		
CV.1se	**0.1**	**0.1**	**0.1**	28.220	**0.1**	
CV.min	**0.1**	**0.1**	**0.1**	31.225	**0.1**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.1**	0.101	0.158	29.239		$\rho = 0.9$
AIC	0.121	0.139	0.159	41.667		$Oracle$: 0.120
BIC	0.121	0.139	0.159	36.591		

Table 60: **Estimation MSE for n=100, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	0.403	**0**	
CV.min	**0**	**0**	**0**	0.410	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.404		$\rho = 0$
AIC	**0**	**0**	**0**	0.441		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.438		
CV.1se	**0**	**0**	**0**	0.375	**0**	
CV.min	**0**	**0**	**0**	0.376	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.385		$\rho = 0.5$
AIC	**0**	**0**	**0**	0.398		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.401		
CV.1se	**0**	**0**	**0**	0.364	**0**	
CV.min	**0**	**0**	**0**	0.359	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.377		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.379		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.384		
CV.1se	**0**	**0**	**0**	1.524	**0**	
CV.min	**0**	**0**	0.001	1.742	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	0.001	0.010	1.450		$\rho = 0$
AIC	0.004	0.007	0.010	1.860		$Oracle$: 0.000
BIC	0.004	0.007	0.010	1.855		
CV.1se	**0**	**0**	**0**	1.389	**0**	
CV.min	**0**	**0**	**0**	1.572	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	0.010	1.323		$\rho = 0.5$
AIC	0.004	0.007	0.010	1.663		$Oracle$: 0.000
BIC	0.004	0.007	0.010	1.660		
CV.1se	**0**	**0**	**0**	1.316	**0**	
CV.min	**0**	**0**	**0**	1.479	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	0.010	1.265		$\rho = 0.9$
AIC	0.003	0.006	0.010	1.579		$Oracle$: 0.000
BIC	0.003	0.006	0.010	1.576		
CV.1se	**0**	**0**	**0**	5.985	**0**	
CV.min	0.001	0.001	0.001	7.110	0.002	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.001	0.010	0.030	5.194		$\rho = 0$
AIC	0.012	0.019	0.031	7.571		$Oracle$: 0.000
BIC	0.012	0.019	0.031	7.567		
CV.1se	**0**	**0**	**0**	5.375	**0**	
CV.min	0.001	0.001	0.001	6.395	0.001	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.001	0.009	0.027	4.662		$\rho = 0.5$
AIC	0.011	0.017	0.027	6.772		$Oracle$: 0.000
BIC	0.011	0.017	0.027	6.765		
CV.1se	**0**	**0**	**0**	5.029	**0**	
CV.min	0.001	0.001	0.001	6.006	0.001	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.001	0.008	0.026	4.423		$\rho = 0.9$
AIC	0.011	0.016	0.026	6.407		$Oracle$: 0.000
BIC	0.011	0.016	0.026	6.399		

Table 61: **Estimation MSE for n=100, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.005	0.004	0.008	0.841	0.003	
CV.min	**0.001**	**0.001**	0.006	0.863	**0.001**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.002	**0.001**	0.003	0.862		$\rho = 0$
AIC	0.002	0.002	0.003	0.927		$Oracle$: 0.000
BIC	0.002	0.002	0.003	0.922		
CV.1se	0.007	0.006	0.009	0.790	0.005	
CV.min	0.003	0.002	0.007	0.793	0.002	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.004	**0.001**	0.003	0.827		$\rho = 0.5$
AIC	0.003	0.002	0.003	0.837		$Oracle$: 0.000
BIC	0.003	0.002	0.003	0.836		
CV.1se	0.008	0.006	0.009	0.762	0.005	
CV.min	0.003	0.003	0.007	0.755	0.003	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.005	**0.002**	0.004	0.815		$\rho = 0.9$
AIC	0.003	**0.002**	0.004	0.791		$Oracle$: 0.000
BIC	0.003	**0.002**	0.004	0.791		
CV.1se	**0.01**	**0.01**	**0.01**	3.217	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.664	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.011	0.023	3.088		$\rho = 0$
AIC	0.011	0.014	0.023	3.868		$Oracle$: 0.000
BIC	0.011	0.014	0.023	3.862		
CV.1se	**0.01**	**0.01**	**0.01**	2.928	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.296	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.021	2.816		$\rho = 0.5$
AIC	0.011	0.014	0.022	3.462		$Oracle$: 0.000
BIC	0.011	0.014	0.022	3.459		
CV.1se	**0.01**	**0.01**	**0.01**	2.773	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.084	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.021	2.682		$\rho = 0.9$
AIC	0.011	0.013	0.021	3.265		$Oracle$: 0.000
BIC	0.011	0.013	0.021	3.261		
CV.1se	**0.01**	**0.01**	**0.01**	12.422	**0.01**	
CV.min	**0.01**	**0.01**	0.011	14.796	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.036	0.068	10.768		$\rho = 0$
AIC	0.027	0.044	0.068	15.664		$Oracle$: 0.003
BIC	0.027	0.044	0.068	15.651		
CV.1se	**0.01**	**0.01**	**0.01**	11.124	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	13.209	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.032	0.060	9.630		$\rho = 0.5$
AIC	0.025	0.039	0.060	13.966		$Oracle$: 0.003
BIC	0.025	0.039	0.060	13.954		
CV.1se	**0.01**	**0.01**	**0.01**	10.449	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	12.416	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.030	0.057	9.146		$\rho = 0.9$
AIC	0.025	0.038	0.057	13.205		$Oracle$: 0.002
BIC	0.025	0.038	0.057	13.199		

Table 62: **Estimation MSE for n=100, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.007	0.005	0.009	0.934	0.004	
CV.min	0.002	0.002	0.007	0.959	0.002	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.003	**0.001**	0.004	0.959		$\rho = 0$
AIC	0.003	0.002	0.004	1.031		$Oracle$: 0.000
BIC	0.003	0.002	0.004	1.025		
CV.1se	0.008	0.007	0.009	0.874	0.005	
CV.min	0.004	0.003	0.007	0.879	0.003	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.005	**0.002**	0.004	0.917		$\rho = 0.5$
AIC	0.004	**0.002**	0.004	0.928		$Oracle$: 0.000
BIC	0.004	**0.002**	0.004	0.928		
CV.1se	0.009	0.007	0.009	0.849	0.006	
CV.min	0.005	0.004	0.008	0.840	0.004	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.006	**0.002**	0.005	0.903		$\rho = 0.9$
AIC	0.005	0.003	0.005	0.881		$Oracle$: 0.000
BIC	0.005	0.003	0.005	0.880		
CV.1se	**0.01**	**0.01**	**0.01**	3.578	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	4.070	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.012	0.025	3.438		$\rho = 0$
AIC	0.011	0.016	0.026	4.298		$Oracle$: 0.000
BIC	0.011	0.016	0.026	4.294		
CV.1se	**0.01**	**0.01**	**0.01**	3.253	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.657	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.011	0.024	3.134		$\rho = 0.5$
AIC	0.011	0.016	0.024	3.843		$Oracle$: 0.000
BIC	0.011	0.016	0.024	3.840		
CV.1se	**0.01**	**0.01**	**0.01**	3.086	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.431	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.011	0.023	2.981		$\rho = 0.9$
AIC	0.011	0.015	0.023	3.630		$Oracle$: 0.000
BIC	0.011	0.015	0.023	3.626		
CV.1se	**0.01**	**0.01**	**0.01**	13.819	**0.01**	
CV.min	**0.01**	0.011	0.011	16.457	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.042	0.075	11.988		$\rho = 0$
AIC	0.030	0.049	0.075	17.413		$Oracle$: 0.004
BIC	0.030	0.049	0.075	17.404		
CV.1se	**0.01**	**0.01**	**0.01**	12.374	**0.01**	
CV.min	**0.01**	**0.01**	0.011	14.684	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.037	0.067	10.713		$\rho = 0.5$
AIC	0.027	0.044	0.067	15.531		$Oracle$: 0.003
BIC	0.027	0.044	0.067	15.519		
CV.1se	**0.01**	**0.01**	**0.01**	11.623	**0.01**	
CV.min	**0.01**	**0.01**	0.011	13.816	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.035	0.064	10.184		$\rho = 0.9$
AIC	0.027	0.043	0.064	14.704		$Oracle$: 0.003
BIC	0.027	0.043	0.064	14.697		

Table 63: **Estimation MSE for n=100, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.007	0.006	0.009	0.985	0.004	
CV.min	0.003	0.002	0.007	1.011	0.002	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.004	**0.001**	0.004	1.011		$\rho = 0$
AIC	0.004	0.002	0.005	1.087		$Oracle$: 0.000
BIC	0.004	0.002	0.005	1.081		
CV.1se	0.008	0.007	0.009	0.925	0.005	
CV.min	0.004	0.003	0.007	0.931	0.003	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.006	**0.002**	0.004	0.968		$\rho = 0.5$
AIC	0.005	**0.002**	0.004	0.982		$Oracle$: 0.000
BIC	0.005	**0.002**	0.004	0.982		
CV.1se	0.009	0.007	0.010	0.892	0.006	
CV.min	0.005	0.004	0.008	0.885	0.004	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.007	**0.003**	0.005	0.952		$\rho = 0.9$
AIC	0.005	**0.003**	0.005	0.928		$Oracle$: 0.000
BIC	0.005	**0.003**	0.005	0.928		
CV.1se	**0.01**	**0.01**	**0.01**	3.769	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	4.292	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.013	0.027	3.627		$\rho = 0$
AIC	0.012	0.018	0.027	4.532		$Oracle$: 0.000
BIC	0.012	0.018	0.027	4.527		
CV.1se	**0.01**	**0.01**	**0.01**	3.440	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.871	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.012	0.025	3.309		$\rho = 0.5$
AIC	0.012	0.017	0.026	4.065		$Oracle$: 0.000
BIC	0.012	0.017	0.026	4.062		
CV.1se	**0.01**	**0.01**	**0.01**	3.262	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.629	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	0.012	0.024	3.148		$\rho = 0.9$
AIC	0.012	0.016	0.024	3.837		$Oracle$: 0.000
BIC	0.012	0.016	0.024	3.834		
CV.1se	**0.01**	**0.01**	**0.01**	14.577	**0.01**	
CV.min	0.011	0.011	0.011	17.364	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.044	0.079	12.631		$\rho = 0$
AIC	0.032	0.052	0.080	18.385		$Oracle$: 0.005
BIC	0.032	0.052	0.080	18.376		
CV.1se	**0.01**	**0.01**	**0.01**	13.056	**0.01**	
CV.min	0.011	0.011	0.011	15.485	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.039	0.072	11.270		$\rho = 0.5$
AIC	0.029	0.046	0.072	16.380		$Oracle$: 0.004
BIC	0.029	0.046	0.072	16.367		
CV.1se	**0.01**	**0.01**	**0.01**	12.206	**0.01**	
CV.min	0.011	0.011	0.011	14.533	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.037	0.067	10.720		$\rho = 0.9$
AIC	0.029	0.045	0.068	15.447		$Oracle$: 0.003
BIC	0.029	0.045	0.068	15.439		

Table 64: **Estimation MSE for n=100, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	**0**	**0**	**0**	1.632	**0**	
CV.min	**0**	**0**	**0**	1.640	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	1.632		$\rho = 0$
AIC	**0**	**0**	**0**	1.766		$Oracle$: 0.000
BIC	**0**	**0**	**0**	1.768		
CV.1se	**0**	**0**	**0**	0.921	**0**	
CV.min	**0**	**0**	**0**	0.748	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.999		$\rho = 0.5$
AIC	**0**	**0**	**0**	0.728		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.849		
CV.1se	**0**	**0**	**0**	0.261	**0**	
CV.min	**0**	**0**	**0**	0.199	**0**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0**	**0**	**0**	0.222		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.177		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.297		
CV.1se	**0**	**0**	**0**	6.095	**0**	
CV.min	**0**	**0**	**0**	6.960	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	0.010	5.824		$\rho = 0$
AIC	0.002	0.006	0.010	7.446		$Oracle$: 0.000
BIC	0.002	0.006	0.010	7.412		
CV.1se	**0**	**0**	**0**	2.531	**0**	
CV.min	**0**	**0**	**0**	2.746	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	0.007	2.467		$\rho = 0.5$
AIC	0.001	0.003	0.007	2.933		$Oracle$: 0.000
BIC	0.001	0.003	0.007	2.920		
CV.1se	**0**	**0**	**0**	0.646	**0**	
CV.min	**0**	**0**	**0**	0.621	**0**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0**	**0**	**0**	0.611		$\rho = 0.9$
AIC	**0**	**0**	**0**	0.712		$Oracle$: 0.000
BIC	**0**	**0**	**0**	0.639		
CV.1se	**0**	**0**	**0**	23.828	**0**	
CV.min	0.001	0.001	0.001	28.516	0.002	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.001	0.002	0.026	20.704		$\rho = 0$
AIC	0.010	0.016	0.026	30.325		$Oracle$: 0.000
BIC	0.010	0.016	0.026	30.303		
CV.1se	**0**	**0**	**0**	9.094	**0**	
CV.min	**0**	**0**	**0**	10.848	0.001	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.011	8.188		$\rho = 0.5$
AIC	0.010	0.010	0.011	11.884		$Oracle$: 0.000
BIC	0.010	0.010	0.011	11.864		
CV.1se	**0**	**0**	**0**	2.028	**0**	
CV.min	**0**	**0**	**0**	2.238	**0**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0**	**0**	0.006	2.079		$\rho = 0.9$
AIC	0.006	0.009	0.010	3.023		$Oracle$: 0.000
BIC	0.006	0.009	0.010	2.431		

Table 65: **Estimation MSE for n=100, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.005	0.004	0.008	3.384	0.003	
CV.min	**0.001**	**0.001**	0.005	3.444	**0.001**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.002	**0.001**	0.003	3.455		$\rho = 0$
AIC	**0.001**	**0.001**	0.003	3.711		$Oracle$: 0.000
BIC	**0.001**	**0.001**	0.003	3.701		
CV.1se	0.010	0.010	0.010	1.866	0.010	
CV.min	0.010	0.010	0.010	1.519	0.010	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.010	0.010	**0.009**	2.116		$\rho = 0.5$
AIC	0.010	0.010	**0.009**	1.476		$Oracle$: 0.000
BIC	0.010	0.010	**0.009**	1.505		
CV.1se	**0.01**	**0.01**	**0.01**	0.552	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	0.412	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.01**	**0.01**	**0.01**	0.468		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	0.326		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	0.546		
CV.1se	**0.01**	**0.01**	**0.01**	12.877	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	14.608	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.019	12.408		$\rho = 0$
AIC	**0.01**	0.012	0.020	15.535		$Oracle$: 0.000
BIC	**0.01**	0.012	0.020	15.515		
CV.1se	**0.01**	**0.01**	**0.01**	5.166	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	5.572	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.011	5.099		$\rho = 0.5$
AIC	**0.01**	**0.01**	0.012	5.931		$Oracle$: 0.000
BIC	**0.01**	**0.01**	0.012	5.921		
CV.1se	**0.01**	**0.01**	**0.01**	1.203	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	1.131	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	**0.01**	1.129		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	1.298		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	1.251		
CV.1se	**0.01**	**0.01**	**0.01**	49.772	**0.01**	
CV.min	**0.01**	**0.01**	0.011	59.586	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.022	0.057	43.221		$\rho = 0$
AIC	0.023	0.038	0.057	62.969		$Oracle$: 0.003
BIC	0.023	0.038	0.057	62.940		
CV.1se	**0.01**	**0.01**	**0.01**	18.349	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	21.851	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	**0.01**	0.026	16.449		$\rho = 0.5$
AIC	0.013	0.020	0.027	23.839		$Oracle$: 0.000
BIC	0.013	0.020	0.027	23.828		
CV.1se	**0.01**	**0.01**	**0.01**	3.579	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	3.949	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	**0.01**	0.012	3.663		$\rho = 0.9$
AIC	**0.01**	**0.01**	0.013	5.273		$Oracle$: 0.001
BIC	**0.01**	**0.01**	0.013	4.563		

Table 66: **Estimation MSE for n=100, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.006	0.005	0.009	3.765	0.004	
CV.min	0.002	0.002	0.006	3.830	**0.001**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.003	0.002	0.003	3.830		$\rho = 0$
AIC	0.002	**0.001**	0.003	4.133		$Oracle$: 0.000
BIC	0.002	**0.001**	0.003	4.122		
CV.1se	**0.01**	**0.01**	**0.01**	2.071	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	1.685	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.01**	**0.01**	**0.01**	2.342		$\rho = 0.5$
AIC	**0.01**	**0.01**	**0.01**	1.640		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	1.680		
CV.1se	**0.01**	**0.01**	**0.01**	0.612	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	0.460	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.01**	**0.01**	**0.01**	0.515		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	0.361		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	0.592		
CV.1se	**0.01**	**0.01**	**0.01**	14.293	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	16.209	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.022	13.770		$\rho = 0$
AIC	**0.01**	0.014	0.022	17.237		$Oracle$: 0.000
BIC	**0.01**	0.014	0.022	17.212		
CV.1se	**0.01**	**0.01**	**0.01**	5.737	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	6.183	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.014	5.655		$\rho = 0.5$
AIC	**0.01**	**0.01**	0.014	6.577		$Oracle$: 0.000
BIC	**0.01**	**0.01**	0.014	6.569		
CV.1se	**0.01**	**0.01**	**0.01**	1.331	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	1.250	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	**0.01**	1.251		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	1.436		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	1.397		
CV.1se	**0.01**	**0.01**	**0.01**	55.351	**0.01**	
CV.min	**0.01**	0.011	0.011	66.260	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.025	0.064	48.089		$\rho = 0$
AIC	0.026	0.042	0.064	70.016		$Oracle$: 0.003
BIC	0.026	0.042	0.064	69.985		
CV.1se	**0.01**	**0.01**	**0.01**	20.360	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	24.284	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.011	0.030	18.274		$\rho = 0.5$
AIC	0.017	0.021	0.030	26.493		$Oracle$: 0.001
BIC	0.017	0.021	0.030	26.479		
CV.1se	**0.01**	**0.01**	**0.01**	3.954	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	4.363	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	**0.01**	0.015	4.053		$\rho = 0.9$
AIC	**0.01**	0.011	0.016	5.825		$Oracle$: 0.001
BIC	**0.01**	0.011	0.016	5.048		

Table 67: **Estimation MSE for n=100, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.007	0.005	0.009	3.972	0.004	
CV.min	**0.002**	**0.002**	0.006	4.040	**0.002**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.003	**0.002**	0.003	4.047		$\rho = 0$
AIC	0.003	**0.002**	0.003	4.364		$Oracle$: 0.000
BIC	0.003	**0.002**	0.003	4.352		
CV.1se	**0.01**	**0.01**	**0.01**	2.184	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	1.776	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.01**	**0.01**	**0.01**	2.469		$\rho = 0.5$
AIC	**0.01**	**0.01**	**0.01**	1.731		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	1.784		
CV.1se	**0.01**	**0.01**	**0.01**	0.646	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	0.486	**0.01**	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	**0.01**	**0.01**	**0.01**	0.544		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	0.381		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	0.617		
CV.1se	**0.01**	**0.01**	**0.01**	15.128	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	17.128	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.023	14.556		$\rho = 0$
AIC	**0.01**	0.015	0.023	18.235		$Oracle$: 0.000
BIC	**0.01**	0.015	0.023	18.207		
CV.1se	**0.01**	**0.01**	**0.01**	6.048	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	6.528	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	0.016	5.956		$\rho = 0.5$
AIC	**0.01**	**0.01**	0.016	6.944		$Oracle$: 0.000
BIC	**0.01**	**0.01**	0.016	6.936		
CV.1se	**0.01**	**0.01**	**0.01**	1.404	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	1.319	**0.01**	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	**0.01**	**0.01**	**0.01**	1.321		$\rho = 0.9$
AIC	**0.01**	**0.01**	**0.01**	1.514		$Oracle$: 0.000
BIC	**0.01**	**0.01**	**0.01**	1.473		
CV.1se	**0.01**	**0.01**	**0.01**	58.216	**0.01**	
CV.min	0.011	0.011	0.011	69.840	0.011	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.028	0.068	50.604		$\rho = 0$
AIC	0.027	0.045	0.068	73.731		$Oracle$: 0.004
BIC	0.027	0.045	0.068	73.701		
CV.1se	**0.01**	**0.01**	**0.01**	21.483	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	25.571	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	0.011	0.031	19.296		$\rho = 0.5$
AIC	0.019	0.022	0.032	27.943		$Oracle$: 0.001
BIC	0.019	0.022	0.032	27.930		
CV.1se	**0.01**	**0.01**	**0.01**	4.172	**0.01**	
CV.min	**0.01**	**0.01**	**0.01**	4.606	**0.01**	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	**0.01**	**0.01**	0.017	4.275		$\rho = 0.9$
AIC	**0.01**	0.012	0.017	6.141		$Oracle$: 0.002
BIC	**0.01**	0.012	0.017	5.281		

Table 68: **Nonzero coefficients at n=1000, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	98.7	77.59	49.32	50.55		$\rho = 0$
AIC	610.28	607.78	579.95	51.89		$Oracle$: 33.33
BIC	30.26	26.24	20.04	25.37		
CV.1se	44.17	32.54	20.14	30.83	18.92	
CV.min	111.63	84.28	33.09	55.46	32.41	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	46.46	33.38	20.35	31.05	18.88	
CV.min	114.78	86.83	34.4	55.02	33.29	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	24.04	17.97	12.28	37.57	11.93	
CV.min	77.63	53.9	19.1	115.49	26.51	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	79.62	59.8	48.82	98.15		$\rho = 0$
AIC	741.05	735.09	706.78	151.85		$Oracle$: 26.34
BIC	19.81	16.69	11.64	18.04		
CV.1se	25.49	18.63	12.2	40.99	11.94	
CV.min	82.84	57.87	18.8	119.47	24.93	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	83.24	62.61	48.16	98.94		$\rho = 0.5$
AIC	742.59	736.48	708.61	158.24		$Oracle$: 26.43
BIC	19.78	16.56	11.67	18.13		
CV.1se	27.1	19.2	12.26	40.54	11.86	
CV.min	85.99	60.35	19.91	114.82	25.63	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	85.41	64.03	48.92	100.32		$\rho = 0.9$
AIC	736.9	730.77	702.45	151.49		$Oracle$: 26.14
BIC	19.93	16.69	11.48	18.45		
CV.1se	8.77	6.95	4.92	41.55	5.06	
CV.min	47.87	28.53	9.83	139.79	22.76	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	57.57	39.53	39.22	105.73		$\rho = 0$
AIC	829.32	820.64	811.42	314.03		$Oracle$: 19.71
BIC	8.92	7.28	3.28	10.28		
CV.1se	8.77	7	4.8	45.41	4.88	
CV.min	50.91	31.32	9.68	143.08	20.9	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	59.87	43.09	41.37	105.96		$\rho = 0.5$
AIC	831.55	823.04	812.95	319.27		$Oracle$: 19.37
BIC	8.23	6.88	3.21	9.9		
CV.1se	9.12	7.02	4.69	43.14	4.97	
CV.min	53.04	33.09	9.76	136.65	20.59	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	60.92	42.57	42.85	105.45		$\rho = 0.9$
AIC	827.65	819.44	809.05	303.68		$Oracle$: 19.73
BIC	8.01	6.63	3.13	9.99		

Table 69: **Nonzero coefficients at n=1000, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	187.94	139.04	74.14	146.74	92.12	
CV.min	291.71	225.47	100.87	213.09	158.64	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	219.14	186.37	173.07	187.93		$\rho = 0$
AIC	746.18	738.06	708.24	255.23		$Oracle$: 124.19
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	205.35	151.83	76.5	155.42	90.38	
CV.min	310.8	240.87	106.84	222.72	154.28	$\mathrm{sd}(\mu)/\sigma = 2$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	158.06	135.07	182.65	166.58		$\rho = 0$
AIC	824.28	813.34	804.09	356.82		$Oracle$: 90.22
BIC	24.33	27.67	10.73	40.98		
CV.1se	97.87	66	32.8	126.4	57.39	
CV.min	202.76	137.52	52.74	209.57	142.98	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	162.27	138.56	181.45	173.6		$\rho = 0.5$
AIC	827.91	817.81	807.78	371.71		$Oracle$: 90.23
BIC	17.21	24.66	10.35	38.9		
CV.1se	102.12	68.89	32.98	126.27	59.9	
CV.min	205.75	143.69	54.71	207.26	145.74	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	163.21	141.64	181.46	175.05		$\rho = 0.9$
AIC	825.37	814.97	803.91	365.56		$Oracle$: 89.22
BIC	15.59	23.61	9.46	38.24		
CV.1se	4.84	1.78	0.27	76.42	3.58	
CV.min	67.74	22.94	3.4	182.61	65.14	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	73.42	78.11	61.22	134.75		$\rho = 0$
AIC	873.7	862.77	873.73	462.82		$Oracle$: 56.16
BIC	0.44	0.51	0	2.68		
CV.1se	3.35	1.25	0.14	79.35	2.72	
CV.min	61.22	21.26	2.7	184.1	58.35	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	69.75	75.45	78.41	136.51		$\rho = 0.5$
AIC	874.96	864.43	874.21	477.01		$Oracle$: 56.21
BIC	0.27	0.29	0	2.05		
CV.1se	3.16	1.02	0.17	76.28	1.82	
CV.min	62.94	22.13	2.83	179.17	59.51	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	71.97	76.23	66.45	134.42		$\rho = 0.9$
AIC	872.69	862.02	872.35	471.88		$Oracle$: 56.5
BIC	0.27	0.33	0	1.82		

Table 70: **Nonzero coefficients at n=1000, binary design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	294.74	224.66	128.15	228	238.61	
CV.min	408.34	325.49	175.48	300.71	364.97	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	283.24	251.72	253.6	252.77		$\rho = 0$
AIC	788.18	776.49	752.2	369.07		$Oracle$: 208.71
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	289.92	258.65	252.81	259.51		$\rho = 0.5$
AIC	792.48	780.96	756.95	381.33		$Oracle$: 208.79
BIC	22.87	81.48	100.23	103.41		
CV.1se	311.09	238.15	134.29	234.09	232	
CV.min	425.03	341.01	187.11	307.37	356.24	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	291.91	259.85	252.12	258.04		$\rho = 0.9$
AIC	790.06	779.16	754.31	381.4		$Oracle$: 209.43
BIC	17.89	78.71	103.31	100.59		
CV.1se	117.97	66.72	16.48	162.68	114	
CV.min	242.29	150.86	44.91	252.26	244.73	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	180.21	169.95	232.87	199.96		$\rho = 0$
AIC	845.94	833.3	832.89	447.23		$Oracle$: 143.25
BIC	0.76	2.67	0.19	13.48		
CV.1se	115.95	65.9	13.95	167.65	110.69	
CV.min	248.62	157.09	41.49	256.44	248.62	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	180.51	173.18	234.91	204.3		$\rho = 0.5$
AIC	848.75	836.24	834.17	457.89		$Oracle$: 144
BIC	0.66	1.65	0.03	9.28		
CV.1se	118.78	69.51	12.47	166.55	110.96	
CV.min	251.2	160.55	41.95	252.97	249.02	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	179.73	174.42	236.68	205.2		$\rho = 0.9$
AIC	846.39	833.79	831.4	457.58		$Oracle$: 143.6
BIC	0.45	1.24	0.13	8.69		
CV.1se	1.75	0.14	0.03	81.17	1.44	
CV.min	50.5	7.13	1.01	194.17	52.22	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	61.46	92.2	42.85	137.24		$\rho = 0$
AIC	881.85	869.79	887.57	510.94		$Oracle$: 77.92
BIC	0.11	0.05	0	0.89		
CV.1se	1.26	0.12	0.02	82.25	1.08	
CV.min	41.82	6.08	0.75	193.11	39.59	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	53.43	85.17	50.76	138.06		$\rho = 0.5$
AIC	882.18	871.13	887.71	523.07		$Oracle$: 78.04
BIC	0.08	0.04	0	0.8		
CV.1se	0.77	0.12	0.01	77.97	0.72	
CV.min	40.83	5.28	0.77	188.83	39.76	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	54.18	85.55	46.09	134.93		$\rho = 0.9$
AIC	880.12	868.15	885.31	516.08		$Oracle$: 77.5
BIC	0.1	0.06	0	0.69		

Table 71: **Nonzero coefficients at n=1000, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	386.54	288.5	148.59	299.91	407.31	
CV.min	519.75	416.18	245.95	379.94	555.02	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	394	292.04	145.63	296.62	412.44	
CV.min	524.47	420.01	245.65	378.06	560.97	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	310.24	301.48	337.78	297.73		$\rho = 0.9$
AIC	822.44	806.85	788.27	478.03		$Oracle$: 293.26
BIC	0.31	0.75	77.53	6.91		
CV.1se	99.77	23.82	0.51	186.02	105.59	
CV.min	259.46	100.91	5.01	285.17	263.4	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	167.62	192.74	279.62	211.05		$\rho = 0$
AIC	859.47	844.17	852.09	513.5		$Oracle$: 216.99
BIC	0.17	0.12	0	2.08		
CV.1se	82.81	14.43	0.27	187.17	85.67	
CV.min	249.8	85.88	3.7	286.65	254.83	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	156.61	191.14	283.4	211.14		$\rho = 0.5$
AIC	861.78	846.79	852.79	520.13		$Oracle$: 214.81
BIC	0.14	0.12	0	1.62		
CV.1se	82.72	16.1	0.28	181.5	83.58	
CV.min	249.18	91.76	3.45	279.84	253.07	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	158.92	189.29	279.88	210.19		$\rho = 0.9$
AIC	859.39	844.07	850.26	519.86		$Oracle$: 215.03
BIC	0.14	0.08	0	1.45		
CV.1se	0.7	0.01	0.01	81.98	0.76	
CV.min	36.36	2.03	0.47	198.47	36.68	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	46.73	112.57	22.42	139.26		$\rho = 0$
AIC	885.63	873.54	896.81	537.14		$Oracle$: 90.72
BIC	0.07	0.01	23.29	0.52		
CV.1se	0.69	0.02	0	80.73	0.67	
CV.min	29.29	1.66	0.39	197.07	27.85	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	37.82	101.97	23.89	138.07		$\rho = 0.5$
AIC	885.94	874.09	896.62	543		$Oracle$: 91.39
BIC	0.05	0.01	5.37	0.42		
CV.1se	0.18	0.01	0.01	74.07	0.56	
CV.min	27.58	1.41	0.33	189.77	25.25	$\mathrm{sd}(\mu)/\sigma = 0.5$
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 72: **Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	85.95	59.01	22.88	35.13	18.98	
CV.min	173.58	132.96	51.72	45.41	30.13	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	150.02	120.25	60.25	11.45	32.54	
CV.min	226.55	191.62	98.54	12.54	58.04	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	24.05	18.18	12.51	38.68	11.99	
CV.min	77.57	53.9	19.19	117.71	25.94	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	79.04	49.77	13.8	97.49		$\rho = 0$
AIC	741.44	735.3	707.14	154.26		$Oracle$: 26.18
BIC	19.89	15.73	10.19	18.04		
CV.1se	45.8	31.51	12.76	65.94	12.36	
CV.min	125.9	93.68	28.08	125.17	23.86	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	115.44	82.27	24.26	112.66		$\rho = 0.5$
AIC	688.78	684	652.99	129.65		$Oracle$: 25.84
BIC	19.86	15.23	8.09	24.1		
CV.1se	62.36	64.82	38.31	15.39	24.64	
CV.min	158.96	137.62	66.45	26.62	50.78	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	141.65	114.83	50.41	26.15		$\rho = 0.9$
AIC	377.88	388.6	358.26	26.24		$Oracle$: 23.28
BIC	1.36	1.04	1.11	15.95		
CV.1se	8.8	7	4.92	44.83	5.08	
CV.min	48.52	28.86	9.74	141.58	21.95	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	56.72	24.17	4.06	106.35		$\rho = 0$
AIC	829.75	821.38	811.62	313.25		$Oracle$: 19.21
BIC	8.98	6.23	1.63	10.14		
CV.1se	4.39	5.4	3.2	52.64	5.18	
CV.min	56.57	45.85	11.03	139.38	16.07	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	66.87	38.72	2.97	114.28		$\rho = 0.5$
AIC	798.28	790.49	773.39	252.81		$Oracle$: 18.97
BIC	2.44	1.77	0.96	3.45		
CV.1se	1.01	1	1	12.12	1.22	
CV.min	6.89	5.06	2.4	56.98	10.16	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	12.86	1.84	1	55.73		$\rho = 0.9$
AIC	533.45	552.92	519.96	64.96		$Oracle$: 16.45
BIC	1.36	1.03	1	2.65		

Table 73: **Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	286.64	223.7	103.06	201.21	92.9	
CV.min	396.96	324.17	154.11	258.04	140.39	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	343.32	289.56	174.1	48.16	139.93	
CV.min	433.1	383.15	223.99	63.04	179.43	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	321.61	289.37	208.99	62.33		$\rho = 0.9$
AIC	439.84	423.48	377.82	62.64		$Oracle$: 119.51
BIC	1.5	1.05	1.75	32.92		
CV.1se	94.13	62.87	32.34	120.57	63.43	
CV.min	194.28	130.79	51.03	205.17	151.64	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	156.58	120.05	91.37	165.97		$\rho = 0$
AIC	823.94	812.81	803.32	357		$Oracle$: 90.22
BIC	24.13	21.07	1.31	40.85		
CV.1se	110.61	97.57	41.36	149.28	57.1	
CV.min	247.13	199.81	77.33	228.2	106.15	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	185.73	162.71	130.64	196.87		$\rho = 0.5$
AIC	813.03	804.22	788.13	382.78		$Oracle$: 89.65
BIC	1.29	0.9	0.12	4.35		
CV.1se	13.2	38.87	28.91	46.86	86.02	
CV.min	91.69	148.19	77.18	90.96	136.18	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	66.79	54.07	51.49	87.81		$\rho = 0.9$
AIC	567.7	553.16	511.68	94.55		$Oracle$: 86.22
BIC	1.45	1.05	1	3.31		
CV.1se	4.79	1.67	0.21	79.02	3.63	
CV.min	66.4	24.39	3.5	183.81	65.76	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	72.26	28.51	0.32	135.4		$\rho = 0$
AIC	872.68	861.48	872.95	464.25		$Oracle$: 55.94
BIC	0.38	0.09	0	2.63		
CV.1se	0.13	0.05	0.01	42.91	0.5	
CV.min	14.64	7.21	0.83	146.94	13.54	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	30.47	3.29	0.45	112.22		$\rho = 0.5$
AIC	865.25	855.61	859.09	477.54		$Oracle$: 55.62
BIC	0.16	0.07	0	0.66		
CV.1se	0.17	0.19	0.27	3.57	0.45	
CV.min	7.51	4.62	1.39	50.23	2.88	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	12.82	1.48	0.93	56.12		$\rho = 0.9$
AIC	694.36	675.13	662.68	99.31		$Oracle$: 52.3
BIC	1.3	1.01	0.72	1.48		

Table 74: **Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	381.43	313.85	185.07	258.75	183.17	
CV.min	502.88	427.02	253.3	342.89	238.47	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	424.02	368.39	247.85	61.94	209.98	
CV.min	534.23	478.03	314.91	110.51	258.8	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	118.11	65.7	17.56	164.9	113.82	
CV.min	245.02	151.66	45.64	252.48	245.91	$\text{sd}(\mu)/\sigma = 1$
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		
CV.1se	22.33	21.53	0.62	140.9	25.15	
CV.min	175.27	122.49	6.11	241.24	130.73	$\text{sd}(\mu)/\sigma = 1$
AICc	123.73	133.25	175.33	191.04		$\rho = 0.5$
AIC	843.24	832.53	824.17	488.75		$Oracle$: 143.47
BIC	0.29	0.12	0	1.27		
CV.1se	0.66	0.68	0.53	21.21	2.22	
CV.min	9.09	8.97	1.55	88.13	14.64	$\text{sd}(\mu)/\sigma = 1$
AICc	16.5	1.8	1.58	92.84		$\rho = 0.9$
AIC	648.45	629.05	596.25	147.76		$Oracle$: 139.45
BIC	1.46	1.04	0.96	1.54		
CV.1se	1.41	0.22	0.01	84.18	1.24	
CV.min	50.87	7.05	0.99	194.69	51.01	$\text{sd}(\mu)/\sigma = 0.5$
AICc	60.65	15.8	0.77	139.02		$\rho = 0$
AIC	880.93	869.36	887.1	513.59		$Oracle$: 77.65
BIC	0.09	0.01	72.43	0.91		
CV.1se	0.03	0.01	0	33.29	0.46	
CV.min	9.02	2.35	0.31	135.51	9.12	$\text{sd}(\mu)/\sigma = 0.5$
AICc	20.81	0.5	0.54	101.99		$\rho = 0.5$
AIC	871.52	859.96	871.15	515.82		$Oracle$: 77.66
BIC	0.06	0.01	0	0.35		
CV.1se	0.03	0.04	0.05	0.93	0.44	
CV.min	6.97	4.16	1.25	33.26	4.64	$\text{sd}(\mu)/\sigma = 0.5$
AICc	12.79	1.19	0.34	37.12		$\rho = 0.9$
AIC	746.35	724.68	727.14	91.97		$Oracle$: 73.55
BIC	0.72	0.56	0.09	1.17		

Table 75: **Nonzero coefficients at n=1000, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	387.27	282.37	148.34	299.09	405.88	
CV.min	514.87	409.51	243.47	379.2	546.18	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	308.96	290.14	321.3	300.18		$\rho = 0$
AIC	820.4	803.49	785.31	467.88		$Oracle$: 293.21
BIC	0.4	0.13	239.99	13.26		
CV.1se	362.56	272.47	21.94	237.95	337.59	
CV.min	545.77	453.54	80.12	341.17	570.23	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	206.92	294.14	346.83	258.82		$\rho = 0.5$
AIC	825.52	811.79	789.99	506.01		$Oracle$: 293.08
BIC	0.18	0.06	11.17	1.12		
CV.1se	138.52	113.35	1.64	26.09	58.83	
CV.min	367.65	299.18	8.68	108.77	236.57	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	21.03	49.19	373.04	108.62		$\rho = 0.9$
AIC	655.08	630.68	585.9	205.08		$Oracle$: 292.24
BIC	1.43	1.02	0.83	1.57		
CV.1se	100.97	21.71	0.46	188.19	103.56	
CV.min	262.26	97.96	5.38	285.37	264.16	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	164.94	172.26	167.66	211.65		$\rho = 0$
AIC	859.08	842.76	851.85	513.31		$Oracle$: 215.38
BIC	0.21	0.02	57.73	2.33		
CV.1se	1.16	0.22	0.01	100.15	0.94	
CV.min	43.6	11.7	0.7	220.4	43.56	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	50.78	20.82	92.93	157.62		$\rho = 0.5$
AIC	856.8	842.84	841.34	536.23		$Oracle$: 215.2
BIC	0.09	0.02	0	0.49		
CV.1se	0.08	0.06	0.12	2.54	0.43	
CV.min	8.94	5.47	1.44	47.71	5.17	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	15.13	1.57	0.61	55.82		$\rho = 0.9$
AIC	719.38	695.56	676.52	227.69		$Oracle$: 211.72
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	46.82	11.92	0	138.77		$\rho = 0$
AIC	885.04	873.33	897.03	543		$Oracle$: 91.35
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.01	0.01	0.01	0.7	0.43	
CV.min	5.43	2.73	0.68	30.47	4.77	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	11.34	0.51	0.04	32.27		$\rho = 0.9$
AIC	778.52	754.45	769.48	99.03		$Oracle$: 87.01
BIC	0.19	0.11	0	0.57		

Table 76: **Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	40.31	30.25	20.05	28.86	18.91	
CV.min	104.08	78.72	31.83	53.45	32.56	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	98.98	77.6	49.53	50.58		$\rho = 0$
AIC	610.24	607.85	580.06	51.93		$Oracle : 100$
BIC	30.26	26.27	20.03	25.44		
CV.1se	44.05	32.41	20.14	30.74	18.92	
CV.min	111.63	84.08	33.12	55.42	32.39	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	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		
CV.1se	46.51	33.25	20.37	30.94	18.89	
CV.min	114.65	86.73	34.43	54.94	33.32	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	106.36	82.32	52.09	52.42		$\rho = 0.9$
AIC	603.01	600.65	573.87	53.42		$Oracle : 100$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	79.7	60.07	48.95	98.08		$\rho = 0$
AIC	740.95	735.1	706.81	151.88		$Oracle : 100$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	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		
CV.1se	27.06	19.2	12.25	40.53	11.86	
CV.min	85.96	60.33	19.87	114.79	25.6	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	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		
CV.1se	8.8	6.95	4.91	41.65	5.07	
CV.min	47.95	28.46	9.81	139.88	22.67	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	8.74	6.96	4.82	45.44	4.89	
CV.min	50.7	31.3	9.68	143.2	20.67	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	9.09	6.99	4.67	42.87	4.94	
CV.min	52.97	32.97	9.71	136.41	20.61	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	60.81	42.54	42.61	105.16		$\rho = 0.9$
AIC	827.67	819.49	808.99	303.88		$Oracle : 100$
BIC	7.99	6.61	3.12	9.98		

Table 77: **Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	188.41	140.01	74.22	147.32	81.29	
CV.min	289.76	221.83	99.21	213.1	134.08	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	194.84	144.12	76.4	148.48	84.21	
CV.min	294.36	226.66	103.29	212.98	137.41	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	224.82	188.63	156.12	190.14		$\rho = 0.9$
AIC	744.2	736.1	707.58	256.68		$Oracle$: 100
BIC	98.35	83.67	62.07	89.85		
CV.1se	92.82	63.09	33.42	116.47	61.88	
CV.min	189.27	129.13	52.46	199.8	146.01	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	156.92	133.8	177.89	165.06		$\rho = 0$
AIC	822.82	812.25	802.46	349.39		$Oracle$: 100
BIC	27.09	29.39	12.51	42.5		
CV.1se	97.71	66.33	34.01	123.65	56.4	
CV.min	200.44	136.59	53.86	206.79	135.58	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	160.48	137.61	178.76	171.72		$\rho = 0.5$
AIC	826.98	816.89	806.41	366.05		$Oracle$: 100
BIC	20.09	26.68	12.12	40.6		
CV.1se	101.85	69.13	34.08	124.03	58.66	
CV.min	203.2	142.1	54.92	203.48	139.78	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	161.88	139.63	170.51	170.88		$\rho = 0.9$
AIC	824.07	813.66	803.39	359.09		$Oracle$: 100
BIC	18.13	25.73	11.32	40.25		
CV.1se	5.14	1.94	0.32	75.75	3.89	
CV.min	68.01	23.77	3.63	181.1	65.78	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	73.78	78.02	58.36	134.92		$\rho = 0$
AIC	873.17	862.19	872.83	460.57		$Oracle$: 100
BIC	0.42	0.54	0	2.88		
CV.1se	3.73	1.4	0.22	79.67	2.83	
CV.min	62.83	22.25	2.8	184.49	60.13	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	71.13	76.14	77.37	136.84		$\rho = 0.5$
AIC	874.64	863.95	873.95	476.73		$Oracle$: 100
BIC	0.32	0.31	0	2.06		
CV.1se	3.54	1.18	0.2	75.93	2.03	
CV.min	64.88	23.58	3.04	178.4	60.99	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	72.02	78.07	69.22	134.39		$\rho = 0.9$
AIC	872.43	861.77	871.47	470.23		$Oracle$: 100
BIC	0.32	0.36	0	2		

Table 78: **Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	231.16	169.53	103.44	185.96	103.13	
CV.min	328.69	242.85	120.28	246.37	127.02	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	237.69	173.96	105.44	187.29	107.38	
CV.min	332.46	247.39	124.42	246.92	131.25	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	251.99	205.79	146.88	219.8		$\rho = 0.9$
AIC	769.94	760.51	737.48	314.21		$Oracle : 100$
BIC	141.89	122.11	92.61	130.1		
CV.1se	119.45	79.11	35.38	148.1	108.55	
CV.min	228.04	153.54	64.93	229.09	220.12	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	181.78	160.48	201.95	189		$\rho = 0$
AIC	839.55	827.34	826	408.19		$Oracle : 100$
BIC	1.65	10.06	1.15	31.29		
CV.1se	123.87	82.92	34.86	155.56	107.96	
CV.min	239.32	163.23	67.23	237.8	225.34	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	186.12	166.46	203.71	194.05		$\rho = 0.5$
AIC	842.41	831.19	827.35	420.37		$Oracle : 100$
BIC	1.13	5.19	0.59	22.8		
CV.1se	129.01	85.92	34.2	155.18	109.89	
CV.min	243.13	167.63	66.68	233.79	226.19	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	187.36	169.38	204.68	196.69		$\rho = 0.9$
AIC	840	828.47	824.8	420.29		$Oracle : 100$
BIC	0.91	4.39	0.79	19.91		
CV.1se	2.57	0.43	0.05	80.47	2.17	
CV.min	59.44	10.68	1.48	189.97	58.18	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	66.39	89.24	43.93	139.2		$\rho = 0$
AIC	879.35	868.09	884.4	496.45		$Oracle : 100$
BIC	0.15	0.08	0	1.19		
CV.1se	1.88	0.18	0.02	82.72	1.39	
CV.min	50.8	9.75	1.01	191.88	50.04	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	60.04	85.66	54.66	140.12		$\rho = 0.5$
AIC	880.25	869.19	884.55	509.2		$Oracle : 100$
BIC	0.12	0.09	0	0.96		
CV.1se	1.44	0.17	0.02	79.43	0.86	
CV.min	51.62	9.15	1.13	188.07	49.41	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	62.19	85.73	48.2	137.21		$\rho = 0.9$
AIC	878	866.48	882.09	502.58		$Oracle : 100$
BIC	0.12	0.08	0	0.91		

Table 79: **Nonzero coefficients at n=1000, binary design, sparse covariates, and decay 200**.

	lasso	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	240.16	164.98	106.23	194.44	103.18	
CV.min	335.75	230.41	115.06	250.41	115.2	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	246.41	169.61	108.95	197.57	107.39	
CV.min	338.95	235.48	119.59	252.67	117.65	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	256.47	198	118.41	227.23		$\rho = 0.9$
AIC	779.85	768.82	749.55	334.42		$Oracle : 100$
BIC	161.59	131.61	100.9	152.24		
CV.1se	129.48	81.48	29.41	161.11	126.39	
CV.min	242.28	157.77	63.88	241.7	243.14	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	189.39	169.39	217.21	199.46		$\rho = 0$
AIC	845.87	832.2	835.41	431.73		$Oracle : 100$
BIC	0.45	3.82	0.76	16.61		
CV.1se	134.01	85.2	25.91	169.33	128.57	
CV.min	253.93	168.79	62.37	250.16	251.34	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	196.41	178.87	213.42	206.23		$\rho = 0.5$
AIC	848.39	835.64	836.52	443.43		$Oracle : 100$
BIC	0.37	1.65	0.13	10.15		
CV.1se	139.37	87.46	24.14	167.83	130.85	
CV.min	257.87	171.74	60.9	246.36	254.61	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	197.94	180.1	215.47	206.57		$\rho = 0.9$
AIC	845.72	833.26	834.34	441.87		$Oracle : 100$
BIC	0.39	1.11	0.23	8.32		
CV.1se	1.88	0.22	0.02	81.93	1.62	
CV.min	54.98	6.41	0.92	193.49	54.94	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	63.37	99.88	29.39	139.5		$\rho = 0$
AIC	881.36	869.27	889.4	509.19		$Oracle : 100$
BIC	0.11	0.03	0	0.86		
CV.1se	1.43	0.09	0.01	82.83	1.02	
CV.min	44.69	5.2	0.7	193.75	44.46	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	54.93	95.46	36.01	139.94		$\rho = 0.5$
AIC	882.37	870.91	889.49	520.33		$Oracle : 100$
BIC	0.09	0.03	0	0.76		
CV.1se	0.94	0.05	0.01	79.93	0.68	
CV.min	45.09	5.03	0.74	191.22	42.83	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	56.35	95.23	32.88	137.59		$\rho = 0.9$
AIC	879.67	867.66	886.91	511.9		$Oracle : 100$
BIC	0.09	0.04	0	0.71		

Table 80: **Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	40.34	30.68	20.09	29.14	18.79	
CV.min	103.9	78.64	31.79	53.91	32.54	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	98.48	71.33	25.64	50.68		$\rho = 0$
AIC	610.08	607.83	580.37	52.03		$Oracle : 100$
BIC	30.11	25.35	18.6	25.49		
CV.1se	86.05	59.04	23.03	35.08	19	
CV.min	173.55	132.87	51.75	45.39	30.05	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	146.39	111.64	45.26	45.15		$\rho = 0.5$
AIC	539.81	539.49	515.13	45.25		$Oracle : 100$
BIC	39.2	29.42	16.74	34.1		
CV.1se	150.05	120.12	60.24	11.46	32.46	
CV.min	226.55	191.32	98.49	12.56	57.98	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	190.69	161.01	82.82	12.56		$\rho = 0.9$
AIC	243.07	239.05	197.73	12.56		$Oracle : 100$
BIC	70.99	57.34	20.8	12.47		
CV.1se	23.98	18.16	12.49	38.71	11.98	
CV.min	77.49	53.9	19.15	117.83	25.81	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	78.84	49.84	13.8	97.65		$\rho = 0$
AIC	741.49	735.39	707.33	154.27		$Oracle : 100$
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		$Oracle : 100$
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		$Oracle : 100$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	56.7	24.13	4.05	106.25		$\rho = 0$
AIC	829.74	821.32	811.77	313.14		$Oracle : 100$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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		$\rho = 0.9$
AIC	535.11	553.6	520.08	64.94		$Oracle : 100$
BIC	1.36	1.03	1	2.67		

Table 81: **Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	284.92	221.99	104.54	200.39	91.86	
CV.min	390.74	318.95	154.52	253.92	139.8	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	342.59	289.9	175.27	48.48	139.78	
CV.min	426.59	380.66	224.62	62.76	179.84	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	93.83	63.48	33.21	117.33	61.69	
CV.min	191.52	129.04	51.84	200.59	145.7	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	156.08	118.76	84.3	163.3		$\rho = 0$
AIC	822.66	811.93	802.09	348.76		$Oracle$: 100
BIC	26.51	23.2	1.76	42.37		
CV.1se	116.23	101.52	43.51	150.2	57.17	
CV.min	248.97	201.84	79.21	228.54	105.01	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	188.55	164.27	129.46	198.09		$\rho = 0.5$
AIC	811.45	802.63	786.48	377.81		$Oracle$: 100
BIC	1.34	0.96	0.16	4.54		
CV.1se	16.24	49.35	37.22	47.73	92.25	
CV.min	110.88	164.45	92.11	90.68	141.73	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	77.11	65.1	63.49	88.14		$\rho = 0.9$
AIC	564.08	550.45	509.2	94.01		$Oracle$: 100
BIC	1.46	1.06	1	3.43		
CV.1se	5.04	1.84	0.27	78.71	3.9	
CV.min	67.7	25	3.78	182.97	65.96	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.13	0.06	0.02	43.35	0.49	
CV.min	14.69	7.95	0.88	147.92	13.99	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	30.49	3.35	0.77	112.34		$\rho = 0.5$
AIC	864.61	855.17	859.36	476.25		$Oracle$: 100
BIC	0.17	0.07	0	0.7		
CV.1se	0.17	0.19	0.28	3.68	0.45	
CV.min	7.69	4.71	1.41	51.18	2.9	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	12.68	1.51	0.94	56.79		$\rho = 0.9$
AIC	692.69	673.84	660.71	101.17		$Oracle$: 100
BIC	1.3	1.01	0.74	1.5		

Table 82: **Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	351.92	280.15	152.5	261.44	138.66	
CV.min	448.81	363.11	190.88	328	170.95	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	409.63	353.68	229.43	68.54	198.23	
CV.min	490.29	435.49	269.98	105.81	229.09	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	121.2	79.38	35.15	149.49	107.9	
CV.min	229.92	153.4	64.98	231.73	221.09	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	180.82	144.1	136.48	189.01		$\rho = 0$
AIC	838.97	826.44	824.64	408.23		$Oracle : 100$
BIC	1.65	2.86	0.11	31.63		
CV.1se	75.16	77.87	8.87	160.02	77.52	
CV.min	252.28	210.01	41.08	248.98	158.93	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	1.15	3.51	0.81	32.58	21.48	
CV.min	19.35	34.54	3.75	97.19	72.07	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	2.53	0.45	0.06	83.46	1.85	
CV.min	58.87	10.96	1.34	192.27	60.1	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.01	0	0	36.25	0.46	
CV.min	10.17	3.22	0.36	140.85	10.11	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.04	0.05	0.08	1.22	0.44	
CV.min	8.2	4.73	1.42	36.78	4.99	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		

Table 83: **Nonzero coefficients at n=1000, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	368.76	279.52	144.89	287.33	113.1	
CV.min	460.6	352.01	163.65	357.34	126.15	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	434.56	363.17	226.51	86.17	186.96	
CV.min	518.82	437.77	250.23	144.27	211.49	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	391.51	338.85	201.81	138.83		$\rho = 0.9$
AIC	533.99	511.1	466.14	149.71		$Oracle : 100$
BIC	2.86	1.9	51.45	2.99		
CV.1se	132.12	82.35	29.31	162.1	127.28	
CV.min	244.8	158.63	64.23	242.68	244.45	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	192.86	152.89	145.25	200.17		$\rho = 0$
AIC	845.23	831.63	834.85	433.28		$Oracle : 100$
BIC	0.51	0.42	0.06	16		
CV.1se	39.08	39.47	0.84	157.52	43.03	
CV.min	217.3	167.02	6.82	252.89	178.42	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	140.57	184.71	200.87	206.66		$\rho = 0.5$
AIC	844.4	833.66	828.74	492.97		$Oracle : 100$
BIC	0.17	0.07	0	1.01		
CV.1se	0.76	0.77	0.52	17.07	2.19	
CV.min	15.64	13.74	2.38	88.07	15.8	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	20.44	4.15	9.33	95.41		$\rho = 0.9$
AIC	663.89	643.78	617.88	192.64		$Oracle : 100$
BIC	2.14	1.41	0.87	2.52		
CV.1se	1.82	0.18	0.03	84.71	1.36	
CV.min	54.45	6.51	1.01	194.39	54.99	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	63.21	17.4	0	139.85		$\rho = 0$
AIC	880.57	868.78	888.79	509.84		$Oracle : 100$
BIC	0.1	0	171.44	0.9		
CV.1se	0.01	0.01	0	34.1	0.45	
CV.min	9.14	2.15	0.33	138.25	9.14	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	20.94	0.44	0	102.34		$\rho = 0.5$
AIC	871.94	859.89	873.45	519.26		$Oracle : 100$
BIC	0.06	0.01	0	0.29		
CV.1se	0.03	0.03	0.04	1.03	0.45	
CV.min	8.37	4.41	1.28	32.84	6	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	14.04	1.13	0.16	35.73		$\rho = 0.9$
AIC	757.48	735.05	742.32	103.11		$Oracle : 100$
BIC	0.55	0.36	0.03	1.11		

Table 84: **Nonzero coefficients at n=100, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	10.27	6.8	2.15	40.73	7.02	
CV.min	46.71	25.28	5.6	70.51	34.93	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	20.3	15.31	49.62	26.53		$\rho = 0$
AIC	109.15	96.42	74.5	86.93		$Oracle$: 21.25
BIC	107.58	94.95	73.11	80.43		
CV.1se	8.49	5.59	1.91	41.74	5.52	
CV.min	41.33	23.91	5.15	72.56	28.29	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	18.79	14.63	50.08	26.91		$\rho = 0.5$
AIC	110.09	97.3	75.5	88.14		$Oracle$: 20.95
BIC	108.36	95.99	74.14	83.13		
CV.1se	7.83	5.05	1.68	40.55	5.59	
CV.min	40.17	22.04	4.69	70.46	26.4	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	18.22	13.82	49.99	26.66		$\rho = 0.9$
AIC	109.97	97.37	75.89	88.06		$Oracle$: 20.71
BIC	108.41	95.98	74.52	82.55		
CV.1se	1.81	0.77	0.25	45.13	1.53	
CV.min	19.6	6.41	1.06	78.51	17.37	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	10.38	12.39	52.62	23.34		$\rho = 0$
AIC	112.87	97.64	75.83	93.21		$Oracle$: 14.52
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	10.03	10.77	52.56	23.15		$\rho = 0.5$
AIC	113.35	98.15	76.48	93.57		$Oracle$: 14.39
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.27	0.05	0.02	48.27	0.55	
CV.min	7.44	1.22	0.23	81.9	7.52	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.64	30.06	55.3	20.57		$\rho = 0$
AIC	115.24	95.81	73.4	96.25		$Oracle$: 7.82
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.38	0.1	0.04	46.61	0.51	
CV.min	7.59	1.24	0.25	80.87	7.52	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.84	25.25	55.49	21.38		$\rho = 0.9$
AIC	115.14	96.36	74.23	96.08		$Oracle$: 7.57
BIC	114	94.73	72.25	95.28		

Table 85: **Nonzero coefficients at n=100, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.63	0.18	0.06	51.6	0.71	
CV.min	15.5	2.1	0.36	84.16	15.71	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.84	0.24	0.05	49.94	0.74	
CV.min	14.96	1.93	0.37	82.39	13.87	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.53	0.06	0.03	50.93	0.68	
CV.min	10.62	1.05	0.24	84.51	9.83	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.27	0.05	0.03	48.97	0.54	
CV.min	9.01	0.9	0.19	84.28	8.51	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.15	42.39	56.52	22.08		$\rho = 0.5$
AIC	115.07	93.07	70.49	96.3		$Oracle$: 31.41
BIC	113.93	91.11	68.92	95.77		
CV.1se	0.42	0.06	0.04	48.42	0.53	
CV.min	9.6	0.98	0.26	81.83	9.33	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.24	0.02	0.04	49.59	0.45	
CV.min	6.35	0.36	0.19	84.57	6.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.05	0.03	0.01	49.54	0.44	
CV.min	5.77	0.4	0.17	83.22	5.16	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.18	0.02	0.02	46.56	0.39	
CV.min	6.85	0.36	0.17	80.99	6.62	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		

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

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	6.5	45.45	56.62	22.86		$\rho = 0$
AIC	114.51	90.73	68.48	95.75		$Oracle$: 78.12
BIC	113.45	88.83	67.4	95.12		
CV.1se	0.56	0.1	0.04	52.87	0.6	
CV.min	12.21	0.9	0.26	85.13	11.88	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	6.6	44.09	56.53	22.42		$\rho = 0.5$
AIC	114.74	91.78	69.18	96.19		$Oracle$: 77.79
BIC	113.45	89.75	67.9	95.57		
CV.1se	0.64	0.09	0.04	50.46	0.54	
CV.min	12.02	0.88	0.24	83.31	12.45	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.41	0.05	0.02	51.4	0.57	
CV.min	9.65	0.48	0.2	84.61	9.83	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.79	47.88	57.85	21.65		$\rho = 0$
AIC	115.06	88.95	67.26	96.52		$Oracle$: 38.01
BIC	113.92	86.81	66.33	95.9		
CV.1se	0.34	0.05	0.03	49.83	0.46	
CV.min	7.97	0.57	0.16	83.96	8.55	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.34	47.05	57.51	21.68		$\rho = 0.5$
AIC	115.16	89.52	67.85	96.67		$Oracle$: 36.88
BIC	114.03	87.41	67	95.98		
CV.1se	0.39	0.03	0.03	47.22	0.55	
CV.min	8.78	0.56	0.23	81.79	8.64	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.61	46.79	57.81	21.13		$\rho = 0.9$
AIC	115.04	89.73	68.06	96.25		$Oracle$: 37.12
BIC	113.7	87.74	67.02	95.4		
CV.1se	0.2	0.02	0.02	49.77	0.4	
CV.min	5.81	0.28	0.13	84.14	5.79	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.63	50.71	59.3	20.93		$\rho = 0$
AIC	115.53	84.84	65.39	96.71		$Oracle$: 6.56
BIC	114.32	82.58	64.67	96.11		
CV.1se	0.13	0.03	0.01	49.55	0.47	
CV.min	5.85	0.31	0.14	83.82	5.62	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.95	50.11	58.96	20.32		$\rho = 0.5$
AIC	115.3	85.71	65.69	96.73		$Oracle$: 6.85
BIC	114.2	83.42	64.91	96.1		
CV.1se	0.21	0.01	0.03	46.17	0.43	
CV.min	6.48	0.31	0.15	81.45	6.37	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.47	49.45	59.13	20.78		$\rho = 0.9$
AIC	115.3	85.99	65.81	96.51		$Oracle$: 6.4
BIC	113.86	83.58	65.16	95.7		

Table 87: **Nonzero coefficients at n=100, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.45	0.04	0.04	52.25	0.53	
CV.min	10.77	0.55	0.25	85.36	10.92	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.54	0.06	0.03	50.49	0.56	
CV.min	9.88	0.6	0.24	83.82	10.41	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.47	0.03	0.02	51.32	0.48	
CV.min	9.07	0.39	0.21	85.17	8.91	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.45	49.11	58.71	21.6		$\rho = 0$
AIC	115.24	85.63	65.62	96.59		$Oracle$: 41.56
BIC	114.08	83.57	64.94	96.04		
CV.1se	0.4	0.04	0.03	50.67	0.45	
CV.min	7.8	0.49	0.18	84.22	7.69	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.32	49.29	58.67	21.02		$\rho = 0.5$
AIC	115.28	86.49	65.74	96.41		$Oracle$: 41.26
BIC	114.05	84.25	65.01	95.97		
CV.1se	0.39	0.02	0.02	48.12	0.54	
CV.min	8.81	0.48	0.2	82.08	8.01	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.9	49.58	58.71	21.5		$\rho = 0.9$
AIC	114.88	86.34	66.1	96.19		$Oracle$: 40.75
BIC	113.58	83.96	65.35	95.67		
CV.1se	0.18	0.02	0.02	50.14	0.42	
CV.min	5.9	0.25	0.17	83.88	5.82	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.73	52.14	60.03	20.23		$\rho = 0$
AIC	115.4	81.59	64.13	96.8		$Oracle$: 5.09
BIC	114.27	79.24	63.4	96.05		
CV.1se	0.19	0.03	0.01	49.14	0.47	
CV.min	6.07	0.26	0.13	83.68	5.63	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.82	51.51	59.88	20.47		$\rho = 0.5$
AIC	115.43	82.47	64.43	96.7		$Oracle$: 5.6
BIC	114.34	79.92	63.69	96.1		
CV.1se	0.18	0.02	0.01	46.55	0.44	
CV.min	6.6	0.28	0.13	81.7	6.85	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.19	51.64	60.11	20.74		$\rho = 0.9$
AIC	115.45	82.32	64.49	96.47		$Oracle$: 5.19
BIC	114.16	79.52	63.78	95.85		

Table 88: **Nonzero coefficients at n=100, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	9.38	5.78	2.06	39.46	6.53	
CV.min	42.21	23.33	5.17	69.95	33	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.31	1.14	0.63	37.72	1.69	
CV.min	15.97	10.34	1.86	70.04	10.04	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.37	1.21	1.03	12.61	1.04	
CV.min	8.59	5.65	1.7	34.12	3.12	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.56	0.77	0.25	45.1	1.08	
CV.min	16.67	5.95	1.02	78.33	16.1	$\text{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.51	0.34	0.19	39.43	0.61	
CV.min	9.68	3.89	0.7	72.96	7.51	$\text{sd}(\mu)/\sigma = 1$
AICc	7.04	0.87	51.96	20.33		$\rho = 0.5$
AIC	113.8	100.8	80.71	93.59		$Oracle$: 14.19
BIC	112.15	99.36	78.76	90.59		
CV.1se	1.1	0.96	0.9	6.97	0.95	
CV.min	9	5.41	1.56	25.81	3.19	$\text{sd}(\mu)/\sigma = 1$
AICc	7.81	1.47	1.78	13.76		$\rho = 0.9$
AIC	107.62	95.04	76	74.16		$Oracle$: 11.62
BIC	105.62	94.71	75.15	4.18		
CV.1se	0.34	0.08	0.03	48.1	0.51	
CV.min	6.94	1.3	0.23	81.96	6.86	$\text{sd}(\mu)/\sigma = 0.5$
AICc	5.64	7.83	56.31	20.66		$\rho = 0$
AIC	115.31	95.89	73.5	96.41		$Oracle$: 7.87
BIC	114.09	94.57	71.52	95.81		
CV.1se	0.09	0.07	0.02	40.22	0.43	
CV.min	5.87	1.58	0.28	74.78	5.28	$\text{sd}(\mu)/\sigma = 0.5$
AICc	5.28	0.63	55.06	20.2		$\rho = 0.5$
AIC	115.46	99.36	78.25	96.17		$Oracle$: 7.65
BIC	113.7	97.86	76.13	95.21		
CV.1se	0.35	0.26	0.17	8.47	0.51	
CV.min	6.83	3.64	0.81	28.53	5.08	$\text{sd}(\mu)/\sigma = 0.5$
AICc	6.83	0.59	38.76	14.49		$\rho = 0.9$
AIC	114.01	97.56	79.03	90.1		$Oracle$: 5.53
BIC	113.06	97.15	78.01	33.12		

Table 89: **Nonzero coefficients at n=100, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	1.3	0.26	0.08	52	1.09	
CV.min	16.99	2.22	0.38	83.98	18.43	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	8.48	14.96	56.34	23.95		$\rho = 0$
AIC	113.97	93.61	70.8	94.96		$Oracle$: 57.19
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	5.7	1.12	55.6	20.13		$\rho = 0.5$
AIC	115.07	98.4	77	96.2		$Oracle$: 56.98
BIC	113.5	96.83	74.87	95.46		
CV.1se	0.51	0.45	0.31	7.67	0.61	
CV.min	7.71	4.6	1.2	27.5	5.56	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	7.44	0.88	25.08	14.94		$\rho = 0.9$
AIC	112.43	96.94	78.26	87.64		$Oracle$: 54.95
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.5	26.93	57.5	21.65		$\rho = 0$
AIC	114.66	92.06	69.78	96.07		$Oracle$: 30.65
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.3	0.23	0.11	7.81	0.41	
CV.min	5.86	3.2	0.67	28.37	5.21	$\mathrm{sd}(\mu)/\sigma = 1$
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	113.37	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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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	86.71	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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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 90: **Nonzero coefficients at n=100, continuous design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.22	0.09	0.02	41.74	0.41	
CV.min	6.41	1.13	0.19	75.51	6.44	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.26	0.15	0.1	8.03	0.38	
CV.min	5.95	2.79	0.59	28.47	4.99	$\text{sd}(\mu)/\sigma = 2$
AICc	5.97	0.39	55.53	15.36		$\rho = 0.9$
AIC	114.85	96.86	78.52	92.57		$Oracle$: 76.01
BIC	113.69	96.21	77.41	45.46		
CV.1se	0.3	0.05	0.03	51.64	0.44	
CV.min	8.77	0.44	0.19	83.44	8.33	$\text{sd}(\mu)/\sigma = 1$
AICc	5.87	43.26	58.6	20.88		$\rho = 0$
AIC	115.09	89.05	67.39	96.38		$Oracle$: 37.66
BIC	114	87.23	66.38	95.79		
CV.1se	0.23	0.05	0.02	41.34	0.41	
CV.min	6.02	0.75	0.18	76.06	5.42	$\text{sd}(\mu)/\sigma = 1$
AICc	4.92	15.17	58.29	19.95		$\rho = 0.5$
AIC	115.57	94	72.01	96.38		$Oracle$: 37.21
BIC	113.99	92	70.37	95.56		
CV.1se	0.13	0.1	0.03	7.66	0.35	
CV.min	4.44	1.82	0.34	29.36	4.55	$\text{sd}(\mu)/\sigma = 1$
AICc	4.79	0.18	61.89	14.63		$\rho = 0.9$
AIC	115.68	95.57	77.87	93.94		$Oracle$: 34.56
BIC	114.84	94.91	76.41	53.27		
CV.1se	0.2	0.04	0.02	48.56	0.42	
CV.min	6.36	0.35	0.18	82.92	5.52	$\text{sd}(\mu)/\sigma = 0.5$
AICc	4.9	50.95	60.05	20.72		$\rho = 0$
AIC	115.38	84.92	65.25	96.58		$Oracle$: 6.81
BIC	114.25	82.92	64.42	95.97		
CV.1se	0.19	0.02	0.01	38.82	0.38	
CV.min	5.61	0.41	0.16	74.96	5.09	$\text{sd}(\mu)/\sigma = 0.5$
AICc	4.38	39.49	59.56	19.93		$\rho = 0.5$
AIC	115.44	89.9	68.67	96.71		$Oracle$: 6.7
BIC	113.88	87.92	67.64	95.92		
CV.1se	0.11	0.04	0.02	7.47	0.35	
CV.min	3.86	0.96	0.22	28.61	3.4	$\text{sd}(\mu)/\sigma = 0.5$
AICc	4.23	0.47	64.76	14.1		$\rho = 0.9$
AIC	116.35	91.88	75.83	94.49		$Oracle$: 6.45
BIC	115.4	91.01	74.37	57.59		

Table 91: **Nonzero coefficients at n=100, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	6.57	46.91	58.63	22.66		$\rho = 0$
AIC	114.72	87.92	66.31	96.21		$Oracle$: 91.12
BIC	113.53	85.95	65.55	95.64		
CV.1se	0.13	0.03	0.02	40.77	0.45	
CV.min	5.82	0.73	0.16	75.21	6.34	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	0.1	0.09	0.04	7.82	0.36	
CV.min	4.77	1.7	0.32	29	4.33	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	5.06	0.24	62.47	15.09		$\rho = 0.9$
AIC	115.24	94.82	77.08	93.74		$Oracle$: 90.49
BIC	114.18	94.19	75.55	54.71		
CV.1se	0.32	0.05	0.03	50.59	0.45	
CV.min	8.62	0.38	0.2	83.59	9.19	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	5.72	50.11	59.32	21.22		$\rho = 0$
AIC	114.97	85.8	65.3	96.45		$Oracle$: 41.19
BIC	113.95	83.48	64.34	95.88		
CV.1se	0.19	0.03	0.01	40.32	0.36	
CV.min	5.87	0.44	0.16	75.03	5.34	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	4.63	33.38	59.49	20.09		$\rho = 0.5$
AIC	115.52	90.77	69.29	96.41		$Oracle$: 41.33
BIC	113.74	88.77	68.06	95.73		
CV.1se	0.11	0.04	0.02	7.11	0.35	
CV.min	3.8	1.17	0.21	28.46	3.72	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	4.36	0.19	63.75	14.38		$\rho = 0.9$
AIC	115.83	92.95	76.28	94.55		$Oracle$: 39.92
BIC	114.57	92.2	74.93	58.59		
CV.1se	0.17	0.04	0.02	48.98	0.41	
CV.min	6.19	0.27	0.17	83.35	5.93	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.79	53.01	60.14	20.33		$\rho = 0$
AIC	115.2	81.51	64.03	96.69		$Oracle$: 5.4
BIC	114.26	79.22	63.24	96.1		
CV.1se	0.13	0.03	0.01	38.83	0.35	
CV.min	5.75	0.3	0.13	74.26	5.07	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.8	48.9	60.57	19.92		$\rho = 0.5$
AIC	115.71	86.57	66.78	96.49		$Oracle$: 5.46
BIC	113.99	84.52	65.89	95.65		
CV.1se	0.09	0.02	0.01	7.04	0.35	
CV.min	3.32	0.77	0.18	28.68	3.24	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.08	2.02	65.28	14.17		$\rho = 0.9$
AIC	116.06	89.46	74.33	94.64		$Oracle$: 5.28
BIC	115.1	88.47	72.94	58.05		

Table 92: **Nonzero coefficients at n=100, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	13.29	9.46	3.97	37.88	9.27	
CV.min	49.64	31.3	9.03	66.79	25.74	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	12.9	9.51	3.65	37.95	9.13	
CV.min	49.97	31.29	8.63	66.12	25.43	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	2.24	1.32	0.37	44.25	1.8	
CV.min	22.92	8.52	1.58	76.86	20.44	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	12.31	10.3	52.27	23.99		$\rho = 0$
AIC	112.3	97.2	75.73	92.06		$Oracle : 10$
BIC	110.82	95.77	74.01	90.62		
CV.1se	1.87	0.97	0.4	45.65	1.34	
CV.min	20.75	8.04	1.29	78.54	17.03	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.25	9.71	51.62	23.01		$\rho = 0.5$
AIC	112.86	98.02	76.29	92.45		$Oracle : 10$
BIC	111.36	96.45	74.48	90.71		
CV.1se	2.07	0.91	0.36	43.34	1.56	
CV.min	20.36	8.18	1.35	75.11	17.3	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.44	9.29	51.97	23.82		$\rho = 0.9$
AIC	112.43	98.3	76.93	92.28		$Oracle : 10$
BIC	110.79	96.77	75.18	90.7		
CV.1se	0.3	0.05	0.03	48.68	0.51	
CV.min	7.54	1.43	0.26	81.23	7.13	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.83	26.06	54.48	21.04		$\rho = 0$
AIC	114.97	96.18	74.3	96.04		$Oracle : 10$
BIC	113.74	94.86	72.14	95.37		
CV.1se	0.18	0.07	0.03	48.41	0.53	
CV.min	7.54	1.3	0.27	82.65	6.92	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.72	23.47	54.59	21.12		$\rho = 0.5$
AIC	114.94	96.9	74.9	96.2		$Oracle : 10$
BIC	113.77	95.4	72.7	95.47		
CV.1se	0.46	0.08	0.05	46.13	0.56	
CV.min	7.85	1.39	0.33	80.29	7.45	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.61	21.6	54.19	21.05		$\rho = 0.9$
AIC	115.04	96.82	74.9	96.08		$Oracle : 10$
BIC	113.73	95.31	72.73	95.3		

Table 93: **Nonzero coefficients at n=100, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	12.85	8.14	2.13	42.89	12.2	
CV.min	52.22	29.99	6.41	72.28	42.91	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	12.45	7.88	1.6	43.29	11.43	
CV.min	51.72	28.89	5.45	72.13	41.13	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.71	0.53	0.18	46.33	1.54	
CV.min	21.83	4.96	0.88	79.69	19.74	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.04	21.93	53.84	24.64		$\rho = 0$
AIC	113.3	95.24	72.79	93.32		$Oracle : 10$
BIC	111.88	93.85	71.27	92.44		
CV.1se	1.35	0.49	0.15	48.46	1.05	
CV.min	18.23	4.31	0.76	80.96	17.35	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	10.07	19.99	54.25	23.47		$\rho = 0.5$
AIC	113.55	96.07	74.08	93.89		$Oracle : 10$
BIC	112.04	94.68	72.11	93.01		
CV.1se	1.48	0.45	0.15	46.58	1.43	
CV.min	18.38	4.3	0.72	78.04	16.64	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	9.91	18.8	53.45	23.86		$\rho = 0.9$
AIC	113.5	96.56	74.22	93.69		$Oracle : 10$
BIC	112.07	94.87	72.43	92.51		
CV.1se	0.19	0.05	0.03	48.89	0.49	
CV.min	7.2	0.78	0.22	82.38	7.36	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.69	41.34	56.18	20.81		$\rho = 0$
AIC	115.05	93.33	71.05	96.19		$Oracle : 10$
BIC	113.79	91.61	69.48	95.57		
CV.1se	0.15	0.09	0.03	48.92	0.51	
CV.min	6.87	0.75	0.22	83.16	6.76	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.32	39.19	56.2	20.6		$\rho = 0.5$
AIC	115.1	93.86	71.59	96.49		$Oracle : 10$
BIC	113.89	92.23	69.58	95.72		
CV.1se	0.35	0.08	0.03	47.2	0.51	
CV.min	7.52	0.85	0.23	81.11	7.4	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.54	39.18	55.9	21.08		$\rho = 0.9$
AIC	115.04	94.12	71.57	96.28		$Oracle : 10$
BIC	113.72	92.32	70.03	95.6		

Table 94: **Nonzero coefficients at n=100, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	12.66	7.82	1.83	43.08	12.63	
CV.min	51.74	29.5	5.79	72.42	45.16	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	12.13	7.54	1.57	43.65	11.08	
CV.min	51.24	27.8	5.46	72.44	42.37	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	23.51	22.16	50.82	29.91		$\rho = 0.9$
AIC	109.96	95.43	72.92	88.15		$Oracle : 10$
BIC	108.27	93.79	71.36	84.83		
CV.1se	1.67	0.54	0.17	46.44	1.52	
CV.min	21.94	4.62	0.85	79.58	19.81	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.21	25.15	54.4	24.47		$\rho = 0$
AIC	113.21	94.98	72.58	93.3		$Oracle : 10$
BIC	111.84	93.46	70.87	92.48		
CV.1se	1.31	0.46	0.16	48.53	1.11	
CV.min	17.75	3.93	0.74	81.02	17.72	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	9.99	22.08	53.71	23.21		$\rho = 0.5$
AIC	113.45	95.41	73.3	93.87		$Oracle : 10$
BIC	112.21	93.9	71.58	93.07		
CV.1se	1.48	0.44	0.15	46.94	1.36	
CV.min	18.39	4.36	0.68	78.06	16.65	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	9.9	20.73	54.31	23.77		$\rho = 0.9$
AIC	113.62	95.86	73.83	93.83		$Oracle : 10$
BIC	111.78	94.25	72.08	92.75		
CV.1se	0.2	0.05	0.03	48.94	0.51	
CV.min	7.25	0.85	0.24	82.54	7.42	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.58	42.66	56.7	20.93		$\rho = 0$
AIC	115.13	92.77	70.27	96.11		$Oracle : 10$
BIC	113.8	91.17	68.87	95.44		
CV.1se	0.13	0.06	0.03	48.89	0.47	
CV.min	7.36	0.71	0.23	82.88	6.72	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.47	40.99	56.27	20.73		$\rho = 0.5$
AIC	115.14	93.36	71.01	96.47		$Oracle : 10$
BIC	114.08	91.68	69.34	95.79		
CV.1se	0.31	0.06	0.03	46.93	0.54	
CV.min	7.5	0.77	0.22	80.97	7.4	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.59	40.25	56.13	21.02		$\rho = 0.9$
AIC	115.22	93.28	71.09	96.18		$Oracle : 10$
BIC	113.78	91.46	69.58	95.53		

Table 95: **Nonzero coefficients at n=100, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	16.3	9.87	2.6	40.81	13.9	
CV.min	56.43	30.25	7.22	68.21	44.62	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	25.96	20.19	50.51	30.09		$\rho = 0$
AIC	109.46	94.02	70.89	86.51		$Oracle: 10$
BIC	107.7	92.34	69.24	81.5		
CV.1se	12.64	7.58	1.76	43.12	12.52	
CV.min	51.72	28.7	5.71	72.35	45.49	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	24.19	21.69	51.09	30.58		$\rho = 0.5$
AIC	109.97	95.16	72.22	88.27		$Oracle: 10$
BIC	108.2	93.63	70.63	85.32		
CV.1se	12.47	7.56	1.56	43.72	11.49	
CV.min	52.07	28.03	5.1	72.34	43.41	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	23.59	22.25	51.31	29.76		$\rho = 0.9$
AIC	110.06	95.27	72.43	88.19		$Oracle: 10$
BIC	108.38	93.75	70.8	85.2		
CV.1se	1.67	0.58	0.17	46.52	1.53	
CV.min	21.53	4.46	0.88	79.52	19.68	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.19	26.01	54.39	24.47		$\rho = 0$
AIC	113.26	94.75	72.32	93.32		$Oracle: 10$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	9.77	23.42	53.92	23.32		$\rho = 0.5$
AIC	113.55	95.31	73.21	93.9		$Oracle: 10$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	9.44	22.28	54.36	24.04		$\rho = 0.9$
AIC	113.62	95.64	73.58	93.83		$Oracle: 10$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.13	0.06	0.02	49.06	0.49	
CV.min	7.18	0.72	0.22	82.87	6.86	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.32	0.09	0.02	47.14	0.5	
CV.min	7.87	0.81	0.21	81.23	7.48	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.56	41.04	56.52	21.18		$\rho = 0.9$
AIC	115.32	93.22	70.92	96.26		$Oracle: 10$
BIC	113.95	91.52	69.54	95.46		

Table 96: **Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.85	2.03	0.98	34.6	2.43	
CV.min	18.64	13.43	2.57	67.88	10.97	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.87	1.57	1.21	14.26	1.38	
CV.min	12.42	8.94	2.65	35.64	4.83	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	2.32	1.23	0.47	42.95	1.56	
CV.min	21.01	7.68	1.51	75.87	17.68	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	12.34	2.64	52.92	22.95		$\rho = 0$
AIC	112.42	97.36	75.51	91.96		$Oracle : 10$
BIC	110.69	96.1	73.51	89.39		
CV.1se	0.65	0.47	0.24	37.69	0.66	
CV.min	10.16	4.68	1	71.7	7.12	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	7.91	1.19	49.4	20.47		$\rho = 0.5$
AIC	112.63	100.66	80.45	92.43		$Oracle : 10$
BIC	110.97	99.28	79.02	88.18		
CV.1se	1.08	1.02	0.88	8.06	0.92	
CV.min	9.12	6.35	1.86	27.66	4.02	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	8.21	1.51	1.5	14.76		$\rho = 0.9$
AIC	108.8	96.79	77.68	77.15		$Oracle : 10$
BIC	107.12	96.28	76.8	6.57		
CV.1se	0.43	0.1	0.04	47.17	0.53	
CV.min	7.26	1.51	0.35	81.57	7.12	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	6.04	5.46	56.14	20.48		$\rho = 0$
AIC	114.91	96.23	74.15	96.17		$Oracle : 10$
BIC	113.8	95.08	71.87	95.47		
CV.1se	0.19	0.1	0.03	40.1	0.4	
CV.min	6.2	1.96	0.33	73.69	5.92	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.5	0.51	54.56	19.49		$\rho = 0.5$
AIC	115.31	99.61	78.56	95.89		$Oracle : 10$
BIC	113.74	98.17	76.53	94.87		
CV.1se	0.27	0.21	0.13	8.65	0.47	
CV.min	6.07	3.78	0.76	29.34	4.84	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	6.02	0.53	39.04	15.1		$\rho = 0.9$
AIC	114.26	98.77	79.84	91.25		$Oracle : 10$
BIC	113.21	98.28	78.81	40.59		

Table 97: **Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.13	0.83	0.32	38.6	1.18	
CV.min	15.96	7.85	1.36	71.45	12.66	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	2.94	2.39	1.55	11.52	1.8	
CV.min	17.32	11.96	3.39	31.45	5.82	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	12.15	2.92	4.24	17.22		$\rho = 0.9$
AIC	110.52	98.92	79.39	82.52		$Oracle : 10$
BIC	109.06	98.51	78.52	16.99		
CV.1se	1.89	0.68	0.22	45.26	1.47	
CV.min	20.44	4.87	1	77.64	19.27	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.4	3.98	55.05	23.7		$\rho = 0$
AIC	112.93	95.4	72.56	93.21		$Oracle : 10$
BIC	111.49	93.86	71.14	92.01		
CV.1se	0.47	0.15	0.09	40.29	0.5	
CV.min	8.63	3.06	0.5	73.88	8.11	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.57	1.17	53.49	20.6		$\rho = 0.5$
AIC	114.17	99.81	78.69	94.66		$Oracle : 10$
BIC	112.51	98.2	76.7	92.95		
CV.1se	0.92	0.75	0.43	10.91	0.9	
CV.min	10.64	7.1	1.62	31.65	6.78	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	8.71	1.03	22.63	16.97		$\rho = 0.9$
AIC	113.45	99.75	80.37	89.73		$Oracle : 10$
BIC	112.3	99.31	79.27	36.91		
CV.1se	0.45	0.08	0.04	47.64	0.51	
CV.min	7.27	1.09	0.24	83.01	6.88	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	5.88	21.4	57.22	20.57		$\rho = 0$
AIC	115.22	93.22	70.71	96.37		$Oracle : 10$
BIC	113.89	91.61	69.19	95.75		
CV.1se	0.16	0.05	0.01	40.62	0.38	
CV.min	5.75	1.27	0.24	74.63	5.47	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.23	0.1	0.04	9.17	0.41	
CV.min	5.11	2.47	0.36	30.21	4.47	$\mathrm{sd}(\mu)/\sigma = 0.5$
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 98: **Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.15	0.8	0.29	38.82	1.13	
CV.min	15.67	7.55	1.3	71.88	12.83	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	3.02	2.37	1.53	11.41	1.84	
CV.min	17.58	11.65	3.21	30.64	6.05	$\mathrm{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.85	0.68	0.25	45.32	1.5	
CV.min	20.34	4.69	0.94	77.91	19.42	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	11.35	4.96	55.5	23.71		$\rho = 0$
AIC	112.88	94.53	72.26	93.26		$Oracle : 10$
BIC	111.39	93.22	70.86	92.15		
CV.1se	0.49	0.15	0.09	40.63	0.55	
CV.min	8.72	2.83	0.49	74.05	7.92	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	6.7	1.08	54.75	20.91		$\rho = 0.5$
AIC	114.18	99.19	78.32	94.66		$Oracle : 10$
BIC	112.37	97.6	76.47	93.35		
CV.1se	0.93	0.75	0.41	11.31	0.92	
CV.min	10.6	6.93	1.59	31.92	6.93	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	8.87	1	28.15	17.33		$\rho = 0.9$
AIC	113.67	99.58	80.42	90.31		$Oracle : 10$
BIC	112.6	98.96	79.3	38.44		
CV.1se	0.39	0.09	0.03	47.88	0.51	
CV.min	7.02	0.94	0.22	83.05	6.92	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	6.03	23.93	58.01	20.39		$\rho = 0$
AIC	115.14	92.72	70.33	96.45		$Oracle : 10$
BIC	113.9	91.32	68.77	95.84		
CV.1se	0.15	0.05	0.01	40.56	0.39	
CV.min	5.64	1.13	0.24	74.59	5.6	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.77	3.34	56.58	18.98		$\rho = 0.5$
AIC	115.38	96.69	74.79	96.22		$Oracle : 10$
BIC	113.88	95.01	72.91	95.49		
CV.1se	0.22	0.09	0.05	9.07	0.39	
CV.min	4.92	2.39	0.35	30.14	4.48	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	4.99	0.18	60.35	14.89		$\rho = 0.9$
AIC	115.45	97.52	79.08	94.04		$Oracle : 10$
BIC	114.32	96.92	77.76	56.09		

Table 99: **Nonzero coefficients at n=100, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	1.17	0.96	0.3	38.95	1.11	
CV.min	15.91	7.53	1.25	71.91	12.68	$\text{sd}(\mu)/\sigma = 2$
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		
CV.1se	3.06	2.36	1.54	11.34	1.82	
CV.min	17.76	11.56	3.37	30.47	6.11	$\text{sd}(\mu)/\sigma = 2$
AICc	12.36	2.97	5.95	17.28		$\rho = 0.9$
AIC	111.5	99.3	79.39	84.64		$Oracle : 10$
BIC	110.17	98.8	78.55	21.46		
CV.1se	1.82	0.61	0.24	45.25	1.42	
CV.min	20.17	4.57	1.05	77.66	19.06	$\text{sd}(\mu)/\sigma = 1$
AICc	11.37	5.38	55.83	23.62		$\rho = 0$
AIC	112.97	94.51	71.98	93.3		$Oracle : 10$
BIC	111.61	93.11	70.39	91.94		
CV.1se	0.45	0.14	0.09	40.74	0.56	
CV.min	8.58	2.68	0.51	74.03	7.9	$\text{sd}(\mu)/\sigma = 1$
AICc	6.68	1.07	54.68	20.64		$\rho = 0.5$
AIC	114.12	99.09	78	94.62		$Oracle : 10$
BIC	112.63	97.48	75.92	93.32		
CV.1se	0.95	0.75	0.38	11.42	0.88	
CV.min	10.38	6.89	1.56	31.8	6.94	$\text{sd}(\mu)/\sigma = 1$
AICc	8.91	0.97	29.77	17.51		$\rho = 0.9$
AIC	113.75	99.3	80.23	90.54		$Oracle : 10$
BIC	112.62	98.61	78.95	40.24		
CV.1se	0.4	0.09	0.03	47.72	0.52	
CV.min	7.16	0.87	0.23	83.11	6.8	$\text{sd}(\mu)/\sigma = 0.5$
AICc	5.98	25.61	57.58	20.44		$\rho = 0$
AIC	115.19	92.21	69.93	96.41		$Oracle : 10$
BIC	114	90.72	68.56	95.8		
CV.1se	0.14	0.05	0.02	40.55	0.38	
CV.min	5.73	1.12	0.24	74.35	5.55	$\text{sd}(\mu)/\sigma = 0.5$
AICc	4.63	3.95	56.76	19.17		$\rho = 0.5$
AIC	115.4	96.71	74.93	96.33		$Oracle : 10$
BIC	113.69	95.06	72.93	95.62		
CV.1se	0.23	0.09	0.04	9.02	0.38	
CV.min	4.93	2.29	0.36	30.16	4.45	$\text{sd}(\mu)/\sigma = 0.5$
AICc	4.92	0.19	60.41	14.85		$\rho = 0.9$
AIC	115.49	97.2	79.11	94.12		$Oracle : 10$
BIC	114.44	96.64	77.64	54.99		

Table 100: **FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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 | 0.85	0.64 | 0.82	0.22 | 0.73	0.54 | 0.72	0.20 | 0.71	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.70 | 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		$\bar{s}_{Oracle}$ = 33.3
BIC	0.22 | 0.71	0.14 | 0.69	0.01 | 0.61	0.17 | 0.63		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 33.3
BIC	0.24 | 0.70	0.15 | 0.68	0.01 | 0.60	0.20 | 0.62		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 33.1
BIC	0.27 | 0.69	0.17 | 0.68	0.02 | 0.60	0.22 | 0.61		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.72 | 0.79	0.63 | 0.77	0.34 | 0.67	0.77 | 0.79		$\rho = 0$
AIC	0.97 | 0.95	0.97 | 0.95	0.97 | 0.93	0.85 | 0.83		$\bar{s}_{Oracle}$ = 26.3
BIC	0.19 | 0.61	0.10 | 0.58	0.00 | 0.45	0.16 | 0.57		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 26.4
BIC	0.21 | 0.59	0.12 | 0.56	0.01 | 0.45	0.19 | 0.56		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.74 | 0.79	0.67 | 0.76	0.39 | 0.68	0.79 | 0.77		$\rho = 0.9$
AIC	0.97 | 0.95	0.97 | 0.95	0.96 | 0.93	0.85 | 0.82		$\bar{s}_{Oracle}$ = 26.1
BIC	0.23 | 0.59	0.13 | 0.56	0.01 | 0.45	0.21 | 0.56		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.73 | 0.69	0.60 | 0.63	0.22 | 0.43	0.85 | 0.76		$\rho = 0$
AIC	0.98 | 0.94	0.98 | 0.94	0.98 | 0.91	0.94 | 0.88		$\bar{s}_{Oracle}$ = 19.7
BIC	0.13 | 0.40	0.06 | 0.36	0.00 | 0.18	0.17 | 0.44		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.75 | 0.68	0.64 | 0.63	0.26 | 0.45	0.85 | 0.75		$\rho = 0.5$
AIC	0.98 | 0.95	0.98 | 0.94	0.98 | 0.92	0.95 | 0.88		$\bar{s}_{Oracle}$ = 19.4
BIC	0.13 | 0.37	0.07 | 0.34	0.00 | 0.18	0.19 | 0.41		
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 | 0.77	0.37 | 0.50	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.76 | 0.66	0.66 | 0.62	0.28 | 0.44	0.86 | 0.73		$\rho = 0.9$
AIC	0.98 | 0.95	0.98 | 0.94	0.98 | 0.92	0.94 | 0.86		$\bar{s}_{Oracle}$ = 19.7
BIC	0.14 | 0.35	0.07 | 0.32	0.00 | 0.17	0.21 | 0.40		

Table 101: **FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 124.2
BIC	0.22 | 0.59	0.13 | 0.56	0.02 | 0.47	0.22 | 0.54		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 123.8
BIC	0.23 | 0.57	0.15 | 0.55	0.02 | 0.47	0.25 | 0.53		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 123.6
BIC	0.25 | 0.56	0.16 | 0.55	0.03 | 0.47	0.27 | 0.52		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.60 | 0.69	0.55 | 0.67	0.62 | 0.69	0.62 | 0.69		$\rho = 0$
AIC	0.90 | 0.94	0.90 | 0.92	0.90 | 0.90	0.79 | 0.82		$\bar{s}_{Oracle}$ = 90.2
BIC	0.08 | 0.24	0.06 | 0.29	0.01 | 0.12	0.17 | 0.38		
CV.1se	0.46 | 0.57	0.31 | 0.49	0.08 | 0.34	0.55 | 0.61	0.23 | 0.46	
CV.min	0.67 | 0.73	0.56 | 0.66	0.21 | 0.46	0.69 | 0.72	0.55 | 0.66	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.61 | 0.68	0.56 | 0.66	0.62 | 0.69	0.64 | 0.68		$\rho = 0.5$
AIC	0.90 | 0.94	0.90 | 0.93	0.90 | 0.90	0.80 | 0.82		$\bar{s}_{Oracle}$ = 90.2
BIC	0.06 | 0.17	0.07 | 0.26	0.01 | 0.12	0.18 | 0.35		
CV.1se	0.48 | 0.57	0.34 | 0.50	0.10 | 0.33	0.56 | 0.61	0.26 | 0.47	
CV.min	0.68 | 0.73	0.58 | 0.67	0.24 | 0.46	0.69 | 0.71	0.56 | 0.66	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.62 | 0.69	0.57 | 0.67	0.63 | 0.69	0.65 | 0.68		$\rho = 0.9$
AIC	0.90 | 0.94	0.90 | 0.93	0.90 | 0.90	0.80 | 0.81		$\bar{s}_{Oracle}$ = 89.2
BIC	0.06 | 0.16	0.08 | 0.24	0.01 | 0.10	0.20 | 0.34		
CV.1se	0.08 | 0.06	0.03 | 0.02	0.00 | 0.01	0.65 | 0.44	0.09 | 0.04	
CV.min	0.61 | 0.41	0.34 | 0.21	0.07 | 0.05	0.80 | 0.64	0.59 | 0.40	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.64 | 0.43	0.63 | 0.43	0.23 | 0.16	0.76 | 0.57		$\rho = 0$
AIC	0.94 | 0.92	0.94 | 0.90	0.94 | 0.90	0.90 | 0.81		$\bar{s}_{Oracle}$ = 56.2
BIC	0.01 | 0.01	0.00 | 0.01	0.00 | 0.00	0.06 | 0.04		
CV.1se	0.07 | 0.04	0.03 | 0.02	0.00 | 0.00	0.67 | 0.42	0.08 | 0.03	
CV.min	0.60 | 0.36	0.34 | 0.19	0.08 | 0.04	0.81 | 0.61	0.57 | 0.35	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.64 | 0.39	0.63 | 0.41	0.29 | 0.20	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		
CV.1se	0.07 | 0.03	0.03 | 0.01	0.00 | 0.00	0.67 | 0.41	0.07 | 0.03	
CV.min	0.61 | 0.36	0.37 | 0.18	0.09 | 0.04	0.81 | 0.60	0.58 | 0.34	$\mathrm{sd}(\mu)/\sigma = 0.5$
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 102: **FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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 | 0.78	0.26 | 0.62	0.51 | 0.71	0.54 | 0.80	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.46 | 0.73	0.41 | 0.71	0.41 | 0.71	0.45 | 0.67		$\rho = 0$
AIC	0.75 | 0.93	0.75 | 0.92	0.75 | 0.89	0.57 | 0.76		
BIC	0.06 | 0.20	0.09 | 0.38	0.08 | 0.43	0.18 | 0.42		$\bar{s}_{Oracle}$ = 208.7
CV.1se	0.49 | 0.74	0.39 | 0.68	0.16 | 0.52	0.44 | 0.63	0.36 | 0.68	
CV.min	0.59 | 0.82	0.52 | 0.78	0.27 | 0.62	0.52 | 0.71	0.52 | 0.79	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.48 | 0.72	0.42 | 0.71	0.40 | 0.71	0.47 | 0.66		$\rho = 0.5$
AIC	0.75 | 0.93	0.75 | 0.93	0.75 | 0.90	0.58 | 0.76		
BIC	0.03 | 0.10	0.10 | 0.35	0.09 | 0.43	0.20 | 0.39		$\bar{s}_{Oracle}$ = 208.8
CV.1se	0.50 | 0.74	0.40 | 0.68	0.18 | 0.52	0.44 | 0.62	0.38 | 0.68	
CV.min	0.60 | 0.82	0.52 | 0.78	0.29 | 0.62	0.53 | 0.70	0.53 | 0.79	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.48 | 0.72	0.43 | 0.71	0.41 | 0.70	0.47 | 0.65		$\rho = 0.9$
AIC	0.75 | 0.93	0.75 | 0.93	0.75 | 0.90	0.59 | 0.75		
BIC	0.03 | 0.08	0.11 | 0.33	0.11 | 0.43	0.21 | 0.38		$\bar{s}_{Oracle}$ = 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	$\mathrm{sd}(\mu)/\sigma = 1$
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		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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.min	0.50 | 0.17	0.19 | 0.04	0.07 | 0.01	0.80 | 0.49	0.52 | 0.17	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 | 0.23	0.62 | 0.29	0.16 | 0.09	0.76 | 0.41		$\rho = 0.9$
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	0.00 | 0.00	0.07 | 0.01		$\bar{s}_{Oracle}$ = 77.5

Table 103: **FDR | Sensitivity for n=1000, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal 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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 293.1
BIC	0.00 | 0.00	0.00 | 0.01	0.13 | 0.23	0.03 | 0.04		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 293.7
BIC	0.00 | 0.00	0.00 | 0.00	0.11 | 0.19	0.02 | 0.03		
CV.1se	0.46 | 0.72	0.38 | 0.61	0.23 | 0.36	0.41 | 0.59	0.47 | 0.74	
CV.min	0.54 | 0.82	0.47 | 0.75	0.34 | 0.54	0.47 | 0.68	0.56 | 0.84	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.40 | 0.63	0.38 | 0.63	0.42 | 0.66	0.41 | 0.59		$\rho = 0.9$
AIC	0.67 | 0.93	0.67 | 0.92	0.67 | 0.89	0.53 | 0.76		$\bar{s}_{Oracle}$ = 293.3
BIC	0.00 | 0.00	0.00 | 0.00	0.11 | 0.17	0.02 | 0.02		
CV.1se	0.35 | 0.28	0.12 | 0.08	0.00 | 0.00	0.48 | 0.44	0.36 | 0.29	
CV.min	0.54 | 0.54	0.34 | 0.28	0.05 | 0.02	0.56 | 0.57	0.55 | 0.55	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.46 | 0.41	0.49 | 0.45	0.60 | 0.51	0.51 | 0.48		$\rho = 0$
AIC	0.77 | 0.91	0.77 | 0.89	0.78 | 0.88	0.68 | 0.75		$\bar{s}_{Oracle}$ = 217.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.02 | 0.01		
CV.1se	0.33 | 0.23	0.09 | 0.05	0.00 | 0.00	0.50 | 0.43	0.34 | 0.24	
CV.min	0.55 | 0.52	0.33 | 0.23	0.04 | 0.01	0.58 | 0.56	0.55 | 0.52	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.47 | 0.38	0.50 | 0.44	0.60 | 0.52	0.52 | 0.47		$\rho = 0.5$
AIC	0.77 | 0.91	0.77 | 0.89	0.78 | 0.88	0.69 | 0.75		$\bar{s}_{Oracle}$ = 214.8
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.02 | 0.01		
CV.1se	0.34 | 0.22	0.10 | 0.05	0.00 | 0.00	0.51 | 0.42	0.35 | 0.23	
CV.min	0.55 | 0.51	0.35 | 0.24	0.04 | 0.01	0.58 | 0.55	0.55 | 0.52	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.48 | 0.38	0.51 | 0.43	0.60 | 0.51	0.53 | 0.46		$\rho = 0.9$
AIC	0.77 | 0.91	0.77 | 0.89	0.78 | 0.88	0.69 | 0.74		$\bar{s}_{Oracle}$ = 215.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.02 | 0.01		
CV.1se	0.03 | 0.00	0.00 | 0.00	0.00 | 0.00	0.72 | 0.24	0.22 | 0.01	
CV.min	0.51 | 0.12	0.16 | 0.01	0.07 | 0.00	0.81 | 0.43	0.54 | 0.12	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.61 | 0.15	0.68 | 0.27	0.07 | 0.04	0.78 | 0.35		$\rho = 0$
AIC	0.91 | 0.91	0.91 | 0.89	0.91 | 0.91	0.88 | 0.71		$\bar{s}_{Oracle}$ = 90.7
BIC	0.01 | 0.00	0.00 | 0.00	0.02 | 0.02	0.09 | 0.00		
CV.1se	0.02 | 0.00	0.00 | 0.00	0.00 | 0.00	0.73 | 0.23	0.24 | 0.00	
CV.min	0.47 | 0.09	0.15 | 0.01	0.07 | 0.00	0.81 | 0.41	0.52 | 0.09	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.12	0.65 | 0.24	0.07 | 0.04	0.78 | 0.33		$\rho = 0.5$
AIC	0.91 | 0.91	0.91 | 0.89	0.91 | 0.91	0.88 | 0.71		$\bar{s}_{Oracle}$ = 91.4
BIC	0.01 | 0.00	0.00 | 0.00	0.01 | 0.01	0.07 | 0.00		
CV.1se	0.01 | 0.00	0.00 | 0.00	0.00 | 0.00	0.72 | 0.21	0.24 | 0.00	
CV.min	0.47 | 0.09	0.16 | 0.01	0.06 | 0.00	0.81 | 0.40	0.51 | 0.08	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.58 | 0.12	0.65 | 0.24	0.07 | 0.04	0.79 | 0.32		$\rho = 0.9$
AIC	0.91 | 0.90	0.91 | 0.89	0.91 | 0.90	0.88 | 0.71		$\bar{s}_{Oracle}$ = 89.5
BIC	0.01 | 0.00	0.00 | 0.00	0.01 | 0.01	0.09 | 0.00		

Table 104: **FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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 | 0.85	0.64 | 0.83	0.22 | 0.72	0.55 | 0.73	0.20 | 0.71	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.70 | 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		$\bar{s}_{Oracle}$ = 33.2
BIC	0.22 | 0.70	0.12 | 0.68	0.00 | 0.57	0.18 | 0.63		
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 | 0.77	0.53 | 0.67	0.60 | 0.55	0.25 | 0.63	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 32.9
BIC	0.49 | 0.59	0.36 | 0.57	0.05 | 0.49	0.49 | 0.51		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.89 | 0.72	0.87 | 0.68	0.78 | 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		$\bar{s}_{Oracle}$ = 30.4
BIC	0.80 | 0.43	0.78 | 0.40	0.49 | 0.31	0.06 | 0.39		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.72 | 0.79	0.57 | 0.75	0.03 | 0.52	0.77 | 0.79		$\rho = 0$
AIC	0.97 | 0.95	0.97 | 0.95	0.97 | 0.93	0.85 | 0.83		$\bar{s}_{Oracle}$ = 26.2
BIC	0.19 | 0.61	0.07 | 0.57	0.00 | 0.40	0.16 | 0.58		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 25.8
BIC	0.41 | 0.44	0.29 | 0.41	0.02 | 0.32	0.51 | 0.43		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.91 | 0.56	0.89 | 0.51	0.77 | 0.39	0.53 | 0.54		$\rho = 0.9$
AIC	0.95 | 0.86	0.95 | 0.88	0.94 | 0.88	0.53 | 0.54		$\bar{s}_{Oracle}$ = 23.3
BIC	0.08 | 0.05	0.01 | 0.04	0.01 | 0.05	0.34 | 0.45		
CV.1se	0.12 | 0.38	0.06 | 0.34	0.01 | 0.26	0.63 | 0.64	0.01 | 0.27	
CV.min	0.70 | 0.67	0.55 | 0.60	0.14 | 0.43	0.89 | 0.81	0.37 | 0.54	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.73 | 0.69	0.43 | 0.57	0.01 | 0.22	0.85 | 0.77		$\rho = 0$
AIC	0.98 | 0.95	0.98 | 0.94	0.98 | 0.91	0.94 | 0.88		$\bar{s}_{Oracle}$ = 19.2
BIC	0.13 | 0.41	0.03 | 0.33	0.00 | 0.09	0.17 | 0.44		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.84 | 0.50	0.71 | 0.41	0.04 | 0.13	0.90 | 0.57		$\rho = 0.5$
AIC	0.98 | 0.95	0.98 | 0.95	0.98 | 0.93	0.94 | 0.74		$\bar{s}_{Oracle}$ = 19.0
BIC	0.10 | 0.11	0.04 | 0.09	0.00 | 0.05	0.17 | 0.12		
CV.1se	0.00 | 0.07	0.00 | 0.07	0.00 | 0.07	0.45 | 0.28	0.01 | 0.07	
CV.min	0.57 | 0.09	0.45 | 0.08	0.16 | 0.07	0.82 | 0.64	0.35 | 0.12	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.70 | 0.10	0.20 | 0.07	0.00 | 0.07	0.81 | 0.64		$\rho = 0.9$
AIC	0.96 | 0.86	0.97 | 0.90	0.97 | 0.88	0.83 | 0.68		$\bar{s}_{Oracle}$ = 16.4
BIC	0.09 | 0.07	0.01 | 0.07	0.00 | 0.07	0.13 | 0.12		

Table 105: **FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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 | 0.84	0.56 | 0.81	0.19 | 0.65	0.58 | 0.74	0.39 | 0.74	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.55 | 0.79	0.47 | 0.77	0.29 | 0.70	0.53 | 0.72		$\rho = 0$
AIC	0.84 | 0.94	0.84 | 0.94	0.84 | 0.91	0.63 | 0.77		$\bar{s}_{Oracle}$ = 122.8
BIC	0.21 | 0.59	0.11 | 0.55	0.01 | 0.43	0.22 | 0.55		
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 | 0.84	0.70 | 0.80	0.47 | 0.66	0.69 | 0.65	0.42 | 0.64	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.68 | 0.74	0.63 | 0.72	0.48 | 0.68	0.67 | 0.62		$\rho = 0.5$
AIC	0.84 | 0.95	0.84 | 0.94	0.83 | 0.93	0.70 | 0.67		$\bar{s}_{Oracle}$ = 122.5
BIC	0.25 | 0.23	0.35 | 0.39	0.15 | 0.41	0.46 | 0.35		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 119.5
BIC	0.05 | 0.01	0.01 | 0.01	0.00 | 0.01	0.47 | 0.14		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 90.2
BIC	0.07 | 0.24	0.03 | 0.23	0.00 | 0.01	0.17 | 0.38		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.72 | 0.57	0.69 | 0.57	0.59 | 0.56	0.75 | 0.55		$\rho = 0.5$
AIC	0.90 | 0.95	0.90 | 0.94	0.90 | 0.92	0.82 | 0.75		$\bar{s}_{Oracle}$ = 89.7
BIC	0.01 | 0.01	0.00 | 0.01	0.00 | 0.00	0.09 | 0.04		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 86.2
BIC	0.06 | 0.01	0.01 | 0.01	0.00 | 0.01	0.11 | 0.03		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 55.9
BIC	0.01 | 0.01	0.00 | 0.00	0.00 | 0.00	0.06 | 0.04		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.63 | 0.13	0.11 | 0.02	0.00 | 0.00	0.84 | 0.32		$\rho = 0.5$
AIC	0.94 | 0.94	0.94 | 0.93	0.94 | 0.91	0.91 | 0.74		$\bar{s}_{Oracle}$ = 55.6
BIC	0.02 | 0.00	0.00 | 0.00	0.00 | 0.00	0.09 | 0.01		
CV.1se	0.00 | 0.00	0.00 | 0.00	0.00 | 0.01	0.14 | 0.03	0.00 | 0.01	
CV.min	0.54 | 0.04	0.44 | 0.03	0.10 | 0.02	0.82 | 0.16	0.17 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.66 | 0.05	0.12 | 0.02	0.00 | 0.02	0.82 | 0.18		$\rho = 0.9$
AIC	0.93 | 0.88	0.93 | 0.87	0.94 | 0.83	0.84 | 0.29		$\bar{s}_{Oracle}$ = 52.3
BIC	0.06 | 0.02	0.01 | 0.02	0.00 | 0.01	0.09 | 0.03		

Table 106: **FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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 | 0.71	0.54 | 0.80	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.46 | 0.73	0.40 | 0.70	0.35 | 0.67	0.45 | 0.67		$\rho = 0$
AIC	0.75 | 0.93	0.75 | 0.92	0.75 | 0.89	0.57 | 0.76		
BIC	0.06 | 0.21	0.08 | 0.34	0.08 | 0.41	0.19 | 0.42		$\bar{s}_{Oracle}$ = 209.8
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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	0.68 | 0.84	0.65 | 0.83	0.61 | 0.22		
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	0.25 | 0.33	0.06 | 0.11	0.51 | 0.56	0.40 | 0.47	
CV.min	0.61 | 0.67	0.47 | 0.54	0.18 | 0.25	0.62 | 0.67	0.61 | 0.67	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.53 | 0.58	0.48 | 0.55	0.48 | 0.49	0.56 | 0.61		$\rho = 0$
AIC	0.84 | 0.92	0.84 | 0.90	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	0.16 | 0.07	0.01 | 0.00	0.65 | 0.34	0.23 | 0.09	
CV.min	0.61 | 0.39	0.51 | 0.31	0.11 | 0.03	0.71 | 0.49	0.55 | 0.33	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.61 | 0.31	0.52 | 0.34	0.53 | 0.45	0.69 | 0.42		$\rho = 0.5$
AIC	0.84 | 0.94	0.84 | 0.93	0.84 | 0.90	0.78 | 0.74		
BIC	0.01 | 0.00	0.00 | 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	0.00 | 0.00	0.38 | 0.05	0.01 | 0.01	
CV.min	0.48 | 0.02	0.40 | 0.02	0.08 | 0.01	0.71 | 0.19	0.21 | 0.04	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.03	0.11 | 0.01	0.00 | 0.01	0.71 | 0.20		$\rho = 0.9$
AIC	0.81 | 0.87	0.81 | 0.86	0.81 | 0.83	0.73 | 0.29		
BIC	0.06 | 0.01	0.01 | 0.01	0.00 | 0.01	0.07 | 0.01		$\bar{s}_{Oracle}$ = 139.4
CV.1se	0.04 | 0.01	0.01 | 0.00	0.00 | 0.00	0.67 | 0.34	0.09 | 0.01	
CV.min	0.53 | 0.23	0.20 | 0.05	0.06 | 0.01	0.79 | 0.53	0.54 | 0.23	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 | 0.27	0.14 | 0.07	0.00 | 0.00	0.75 | 0.45		$\rho = 0$
AIC	0.92 | 0.91	0.92 | 0.89	0.92 | 0.90	0.88 | 0.77		
BIC	0.01 | 0.00	0.00 | 0.00	0.08 | 0.07	0.05 | 0.01		$\bar{s}_{Oracle}$ = 77.7
CV.1se	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.64 | 0.09	0.25 | 0.00	
CV.min	0.38 | 0.03	0.22 | 0.01	0.08 | 0.00	0.84 | 0.28	0.48 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.06	0.05 | 0.00	0.00 | 0.00	0.83 | 0.23		$\rho = 0.5$
AIC	0.92 | 0.92	0.92 | 0.91	0.92 | 0.90	0.89 | 0.70		
BIC	0.02 | 0.00	0.00 | 0.00	0.00 | 0.00	0.10 | 0.00		$\bar{s}_{Oracle}$ = 77.7
CV.1se	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.07 | 0.01	0.05 | 0.01	
CV.min	0.49 | 0.03	0.40 | 0.02	0.14 | 0.01	0.81 | 0.07	0.32 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.64 | 0.04	0.11 | 0.01	0.01 | 0.01	0.82 | 0.08		$\rho = 0.9$
AIC	0.92 | 0.87	0.92 | 0.84	0.92 | 0.82	0.85 | 0.18		
BIC	0.04 | 0.01	0.01 | 0.01	0.00 | 0.00	0.11 | 0.01		$\bar{s}_{Oracle}$ = 73.5

Table 107: **FDR | Sensitivity for n=1000, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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 | 0.70	0.55 | 0.84	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.39 | 0.64	0.36 | 0.63	0.40 | 0.64	0.39 | 0.62		$\rho = 0$
AIC	0.67 | 0.93	0.67 | 0.91	0.67 | 0.88	0.52 | 0.77		$\bar{s}_{Oracle}$ = 293.2
BIC	0.00 | 0.00	0.00 | 0.00	0.28 | 0.43	0.02 | 0.04		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 293.1
BIC	0.00 | 0.00	0.00 | 0.00	0.01 | 0.02	0.04 | 0.00		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 292.2
BIC	0.05 | 0.00	0.01 | 0.00	0.00 | 0.00	0.06 | 0.01		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.46 | 0.41	0.47 | 0.42	0.37 | 0.32	0.51 | 0.48		$\rho = 0$
AIC	0.77 | 0.91	0.77 | 0.88	0.78 | 0.88	0.69 | 0.75		$\bar{s}_{Oracle}$ = 215.4
BIC	0.00 | 0.00	0.00 | 0.00	0.06 | 0.06	0.02 | 0.01		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.48 | 0.10	0.12 | 0.04	0.21 | 0.16	0.63 | 0.27		$\rho = 0.5$
AIC	0.77 | 0.92	0.77 | 0.90	0.77 | 0.89	0.72 | 0.70		$\bar{s}_{Oracle}$ = 215.2
BIC	0.01 | 0.00	0.00 | 0.00	0.00 | 0.00	0.05 | 0.00		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.53 | 0.03	0.10 | 0.01	0.00 | 0.00	0.67 | 0.09		$\rho = 0.9$
AIC	0.75 | 0.85	0.75 | 0.84	0.75 | 0.80	0.69 | 0.33		$\bar{s}_{Oracle}$ = 211.7
BIC	0.04 | 0.00	0.01 | 0.00	0.00 | 0.00	0.09 | 0.01		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 | 0.15	0.09 | 0.03	0.00 | 0.00	0.77 | 0.35		$\rho = 0$
AIC	0.91 | 0.90	0.91 | 0.89	0.91 | 0.91	0.88 | 0.72		$\bar{s}_{Oracle}$ = 91.3
BIC	0.01 | 0.00	0.00 | 0.00	0.65 | 0.64	0.07 | 0.00		
CV.1se	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.64 | 0.06	0.28 | 0.00	
CV.min	0.38 | 0.02	0.20 | 0.00	0.08 | 0.00	0.84 | 0.22	0.50 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.58 | 0.04	0.03 | 0.00	0.00 | 0.00	0.83 | 0.18		$\rho = 0.5$
AIC	0.91 | 0.91	0.91 | 0.89	0.91 | 0.90	0.89 | 0.66		$\bar{s}_{Oracle}$ = 90.9
BIC	0.02 | 0.00	0.00 | 0.00	0.02 | 0.02	0.11 | 0.00		
CV.1se	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.07 | 0.00	0.19 | 0.00	
CV.min	0.42 | 0.02	0.31 | 0.01	0.13 | 0.01	0.82 | 0.05	0.44 | 0.01	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.03	0.07 | 0.00	0.00 | 0.00	0.83 | 0.06		$\rho = 0.9$
AIC	0.91 | 0.85	0.91 | 0.82	0.91 | 0.82	0.85 | 0.15		$\bar{s}_{Oracle}$ = 87.0
BIC	0.02 | 0.00	0.01 | 0.00	0.00 | 0.00	0.10 | 0.01		

Table 108: **FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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 | 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		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.23 | 0.23	0.14 | 0.23	0.01 | 0.20	0.19 | 0.20		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.25 | 0.23	0.16 | 0.22	0.02 | 0.20	0.21 | 0.20		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.66 | 0.25	0.59 | 0.23	0.32 | 0.20	0.71 | 0.26		$\rho = 0$
AIC	0.89 | 0.79	0.89 | 0.79	0.89 | 0.76	0.79 | 0.32		$\bar{s}_{Oracle}$ = 100.0
BIC	0.18 | 0.16	0.09 | 0.15	0.00 | 0.12	0.15 | 0.15		
CV.1se	0.29 | 0.17	0.15 | 0.15	0.01 | 0.12	0.46 | 0.19	0.01 | 0.12	
CV.min	0.68 | 0.25	0.59 | 0.22	0.14 | 0.16	0.76 | 0.28	0.22 | 0.17	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.68 | 0.25	0.60 | 0.23	0.34 | 0.20	0.72 | 0.26		$\rho = 0.5$
AIC	0.89 | 0.79	0.89 | 0.79	0.89 | 0.76	0.79 | 0.32		$\bar{s}_{Oracle}$ = 100.0
BIC	0.20 | 0.15	0.11 | 0.15	0.00 | 0.12	0.17 | 0.15		
CV.1se	0.33 | 0.17	0.17 | 0.15	0.02 | 0.12	0.47 | 0.19	0.01 | 0.12	
CV.min	0.69 | 0.25	0.61 | 0.22	0.17 | 0.16	0.75 | 0.28	0.25 | 0.17	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.11 | 0.07	0.05 | 0.06	0.01 | 0.05	0.56 | 0.14	0.01 | 0.05	
CV.min	0.64 | 0.15	0.50 | 0.13	0.13 | 0.08	0.81 | 0.26	0.35 | 0.11	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.69 | 0.17	0.59 | 0.14	0.23 | 0.11	0.78 | 0.22		$\rho = 0.5$
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 | 0.07	0.06 | 0.06	0.00 | 0.03	0.18 | 0.08		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.70 | 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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.13 | 0.07	0.06 | 0.06	0.00 | 0.03	0.19 | 0.08		

Table 109: **FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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 | 0.89	0.19 | 0.78	0.59 | 0.83	0.36 | 0.84	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 0.89	0.50 | 0.88	0.40 | 0.85	0.55 | 0.81		$\rho = 0$
AIC	0.87 | 0.97	0.87 | 0.96	0.87 | 0.94	0.64 | 0.85		$\bar{s}_{Oracle}$ = 100.0
BIC	0.24 | 0.72	0.14 | 0.70	0.02 | 0.60	0.23 | 0.66		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.26 | 0.70	0.16 | 0.69	0.03 | 0.60	0.26 | 0.64		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.28 | 0.70	0.18 | 0.68	0.04 | 0.60	0.28 | 0.64		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.64	0.53 | 0.61	0.60 | 0.63	0.61 | 0.63		$\rho = 0$
AIC	0.89 | 0.92	0.89 | 0.91	0.89 | 0.89	0.78 | 0.77		$\bar{s}_{Oracle}$ = 100.0
BIC	0.08 | 0.24	0.06 | 0.27	0.01 | 0.12	0.17 | 0.35		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.60 | 0.63	0.55 | 0.60	0.60 | 0.63	0.63 | 0.63		$\rho = 0.5$
AIC	0.89 | 0.92	0.89 | 0.92	0.89 | 0.89	0.79 | 0.77		$\bar{s}_{Oracle}$ = 100.0
BIC	0.06 | 0.18	0.07 | 0.24	0.01 | 0.12	0.18 | 0.32		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.61 | 0.62	0.56 | 0.60	0.59 | 0.62	0.63 | 0.62		$\rho = 0.9$
AIC	0.89 | 0.93	0.89 | 0.91	0.89 | 0.89	0.79 | 0.76		$\bar{s}_{Oracle}$ = 100.0
BIC	0.07 | 0.16	0.08 | 0.23	0.01 | 0.11	0.20 | 0.31		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.01 | 0.00	0.01 | 0.01	0.00 | 0.00	0.05 | 0.03		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.25	0.58 | 0.26	0.27 | 0.15	0.72 | 0.37		$\rho = 0.5$
AIC	0.90 | 0.90	0.90 | 0.89	0.90 | 0.89	0.86 | 0.68		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.05 | 0.02		
CV.1se	0.07 | 0.02	0.03 | 0.01	0.00 | 0.00	0.62 | 0.26	0.08 | 0.01	
CV.min	0.58 | 0.23	0.35 | 0.12	0.09 | 0.02	0.76 | 0.42	0.55 | 0.22	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.61 | 0.25	0.60 | 0.26	0.26 | 0.14	0.72 | 0.36		$\rho = 0.9$
AIC	0.90 | 0.90	0.90 | 0.89	0.90 | 0.89	0.85 | 0.67		$\bar{s}_{Oracle}$ = 100.0
BIC	0.01 | 0.00	0.01 | 0.00	0.00 | 0.00	0.06 | 0.02		

Table 110: **FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	GL $\gamma = 10$	marginal AL	sparsenet MCP	
CV.1se	0.54 | 0.98	0.37 | 0.98	0.08 | 0.93	0.46 | 0.94	0.07 | 0.93	
CV.min	0.68 | 0.99	0.56 | 0.99	0.17 | 0.97	0.58 | 0.96	0.22 | 0.97	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 0.99	0.48 | 0.99	0.26 | 0.97	0.54 | 0.95		$\rho = 0$
AIC	0.87 | 1.00	0.87 | 0.99	0.87 | 0.98	0.67 | 0.97		$\bar{s}_{Oracle}$ = 100.0
BIC	0.30 | 0.93	0.19 | 0.93	0.03 | 0.87	0.29 | 0.87		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.60 | 0.99	0.51 | 0.99	0.28 | 0.98	0.56 | 0.95		$\rho = 0.5$
AIC	0.87 | 1.00	0.87 | 1.00	0.87 | 0.99	0.69 | 0.97		$\bar{s}_{Oracle}$ = 100.0
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.60 | 0.99	0.52 | 0.99	0.29 | 0.97	0.57 | 0.94		$\rho = 0.9$
AIC	0.87 | 1.00	0.87 | 1.00	0.87 | 0.99	0.69 | 0.97		$\bar{s}_{Oracle}$ = 100.0
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.77	0.52 | 0.75	0.59 | 0.75	0.59 | 0.77		$\rho = 0$
AIC	0.89 | 0.95	0.89 | 0.93	0.89 | 0.91	0.78 | 0.89		$\bar{s}_{Oracle}$ = 100.0
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.76	0.54 | 0.75	0.59 | 0.76	0.60 | 0.76		$\rho = 0.5$
AIC	0.89 | 0.95	0.89 | 0.94	0.89 | 0.91	0.79 | 0.89		$\bar{s}_{Oracle}$ = 100.0
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.59 | 0.76	0.55 | 0.75	0.60 | 0.75	0.61 | 0.75		$\rho = 0.9$
AIC	0.89 | 0.95	0.89 | 0.94	0.89 | 0.91	0.79 | 0.88		$\bar{s}_{Oracle}$ = 100.0
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.min	0.51 | 0.24	0.20 | 0.06	0.05 | 0.01	0.74 | 0.49	0.50 | 0.23	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.04 | 0.01		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.23	0.58 | 0.28	0.17 | 0.10	0.71 | 0.40		$\rho = 0.5$
AIC	0.90 | 0.91	0.90 | 0.89	0.90 | 0.90	0.85 | 0.73		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.04 | 0.01		
CV.1se	0.03 | 0.01	0.01 | 0.00	0.00 | 0.00	0.62 | 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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.23	0.59 | 0.28	0.16 | 0.09	0.71 | 0.39		$\rho = 0.9$
AIC	0.90 | 0.91	0.90 | 0.89	0.90 | 0.90	0.85 | 0.72		$\bar{s}_{Oracle}$ = 100.0
BIC	0.01 | 0.00	0.00 | 0.00	0.00 | 0.00	0.06 | 0.01		

Table 111: **FDR | Sensitivity for n=1000, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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 | 0.99	0.13 | 0.99	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 1.00	0.46 | 1.00	0.11 | 0.99	0.53 | 0.98		$\rho = 0$
AIC	0.87 | 1.00	0.87 | 1.00	0.87 | 0.99	0.68 | 0.99		$\bar{s}_{Oracle}$ = 100.0
BIC	0.34 | 0.99	0.20 | 0.99	0.03 | 0.96	0.33 | 0.95		
CV.1se	0.58 | 1.00	0.39 | 1.00	0.06 | 0.99	0.49 | 0.97	0.04 | 0.99	
CV.min	0.70 | 1.00	0.56 | 1.00	0.13 | 1.00	0.60 | 0.98	0.13 | 1.00	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.60 | 1.00	0.48 | 1.00	0.11 | 0.99	0.56 | 0.98		$\rho = 0.5$
AIC	0.87 | 1.00	0.87 | 1.00	0.87 | 0.99	0.70 | 0.99		$\bar{s}_{Oracle}$ = 100.0
BIC	0.37 | 0.98	0.23 | 0.99	0.03 | 0.97	0.36 | 0.94		
CV.1se	0.59 | 1.00	0.41 | 1.00	0.09 | 0.99	0.51 | 0.97	0.07 | 0.99	
CV.min	0.70 | 1.00	0.57 | 1.00	0.16 | 1.00	0.61 | 0.98	0.15 | 1.00	$\mathrm{sd}(\mu)/\sigma = 2$
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
BIC	0.39 | 0.98	0.25 | 0.99	0.04 | 0.97	0.38 | 0.94		
CV.1se	0.43 | 0.72	0.27 | 0.57	0.09 | 0.25	0.51 | 0.77	0.41 | 0.72	
CV.min	0.63 | 0.87	0.49 | 0.79	0.21 | 0.48	0.64 | 0.86	0.63 | 0.87	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.82	0.52 | 0.81	0.60 | 0.80	0.58 | 0.82		$\rho = 0$
AIC	0.89 | 0.96	0.89 | 0.94	0.89 | 0.91	0.78 | 0.93		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.01 | 0.04	0.00 | 0.01	0.05 | 0.15		
CV.1se	0.46 | 0.70	0.30 | 0.57	0.09 | 0.22	0.54 | 0.76	0.43 | 0.70	
CV.min	0.65 | 0.87	0.52 | 0.79	0.22 | 0.45	0.66 | 0.85	0.65 | 0.87	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.81	0.54 | 0.81	0.59 | 0.81	0.60 | 0.81		$\rho = 0.5$
AIC	0.89 | 0.96	0.89 | 0.95	0.89 | 0.92	0.79 | 0.93		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.02	0.00 | 0.00	0.04 | 0.09		
CV.1se	0.48 | 0.70	0.33 | 0.56	0.09 | 0.20	0.55 | 0.74	0.45 | 0.69	
CV.min	0.66 | 0.87	0.53 | 0.79	0.23 | 0.43	0.66 | 0.84	0.65 | 0.87	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.81	0.55 | 0.81	0.60 | 0.80	0.61 | 0.80		$\rho = 0.9$
AIC	0.89 | 0.96	0.89 | 0.94	0.89 | 0.92	0.79 | 0.92		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.01	0.00 | 0.00	0.04 | 0.07		
CV.1se	0.04 | 0.01	0.00 | 0.00	0.00 | 0.00	0.60 | 0.30	0.09 | 0.01	
CV.min	0.49 | 0.22	0.14 | 0.04	0.04 | 0.01	0.73 | 0.50	0.48 | 0.22	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.54 | 0.25	0.60 | 0.32	0.09 | 0.06	0.69 | 0.42		$\rho = 0$
AIC	0.90 | 0.91	0.90 | 0.89	0.90 | 0.90	0.85 | 0.75		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.04 | 0.01		
CV.1se	0.03 | 0.01	0.00 | 0.00	0.00 | 0.00	0.62 | 0.29	0.10 | 0.01	
CV.min	0.45 | 0.17	0.15 | 0.03	0.04 | 0.01	0.74 | 0.48	0.45 | 0.17	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.53 | 0.21	0.59 | 0.30	0.11 | 0.07	0.70 | 0.40		$\rho = 0.5$
AIC	0.90 | 0.91	0.90 | 0.89	0.90 | 0.91	0.85 | 0.75		$\bar{s}_{Oracle}$ = 100.0
BIC	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.05 | 0.01		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.21	0.60 | 0.29	0.10 | 0.06	0.71 | 0.39		$\rho = 0.9$
AIC	0.90 | 0.91	0.90 | 0.89	0.90 | 0.90	0.85 | 0.74		$\bar{s}_{Oracle}$ = 100.0
BIC	0.01 | 0.00	0.00 | 0.00	0.00 | 0.00	0.06 | 0.01		

Table 112: **FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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	$\text{sd}(\mu)/\sigma = 2$
AICc	0.65 | 0.33	0.56 | 0.30	0.09 | 0.22	0.48 | 0.26		$\rho = 0$
AIC	0.88 | 0.72	0.88 | 0.72	0.88 | 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		
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	$\text{sd}(\mu)/\sigma = 2$
AICc	0.77 | 0.34	0.72 | 0.30	0.41 | 0.23	0.56 | 0.20		$\rho = 0.5$
AIC	0.88 | 0.66	0.88 | 0.66	0.87 | 0.65	0.56 | 0.20		$\bar{s}_{Oracle}$ = 100.0
BIC	0.46 | 0.20	0.34 | 0.19	0.04 | 0.16	0.46 | 0.18		
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	$\text{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.74 | 0.17	0.72 | 0.15	0.45 | 0.10	0.05 | 0.12		
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	$\text{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.18 | 0.16	0.07 | 0.14	0.00 | 0.10	0.15 | 0.15		
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	$\text{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.38 | 0.12	0.27 | 0.11	0.02 | 0.08	0.47 | 0.12		
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	$\text{sd}(\mu)/\sigma = 1$
AICc	0.84 | 0.23	0.82 | 0.19	0.71 | 0.12	0.49 | 0.13		$\rho = 0.9$
AIC	0.87 | 0.48	0.87 | 0.49	0.87 | 0.47	0.49 | 0.13		$\bar{s}_{Oracle}$ = 100.0
BIC	0.08 | 0.01	0.01 | 0.01	0.01 | 0.01	0.32 | 0.10		
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	$\text{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 100.0
BIC	0.12 | 0.08	0.03 | 0.06	0.00 | 0.02	0.15 | 0.08		
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	$\text{sd}(\mu)/\sigma = 0.5$
AICc	0.77 | 0.14	0.65 | 0.10	0.04 | 0.02	0.83 | 0.19		$\rho = 0.5$
AIC	0.90 | 0.83	0.90 | 0.82	0.90 | 0.80	0.87 | 0.33		$\bar{s}_{Oracle}$ = 100.0
BIC	0.09 | 0.02	0.04 | 0.02	0.00 | 0.01	0.16 | 0.02		
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	$\text{sd}(\mu)/\sigma = 0.5$
AICc	0.64 | 0.03	0.18 | 0.01	0.00 | 0.01	0.74 | 0.14		$\rho = 0.9$
AIC	0.88 | 0.58	0.89 | 0.60	0.89 | 0.57	0.76 | 0.15		$\bar{s}_{Oracle}$ = 100.0
BIC	0.08 | 0.01	0.01 | 0.01	0.00 | 0.01	0.12 | 0.02		

Table 113: **FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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 | 0.89	0.19 | 0.78	0.59 | 0.83	0.36 | 0.84	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 0.89	0.49 | 0.87	0.23 | 0.78	0.55 | 0.81		$\rho = 0$
AIC	0.87 | 0.97	0.87 | 0.96	0.87 | 0.94	0.64 | 0.85		
BIC	0.24 | 0.72	0.12 | 0.68	0.01 | 0.54	0.24 | 0.66		$\bar{s}_{Oracle}$ = 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 | 0.91	0.72 | 0.89	0.48 | 0.78	0.71 | 0.73	0.42 | 0.76	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.70 | 0.84	0.66 | 0.83	0.47 | 0.79	0.69 | 0.71		$\rho = 0.5$
AIC	0.86 | 0.97	0.86 | 0.97	0.86 | 0.96	0.72 | 0.74		
BIC	0.32 | 0.35	0.38 | 0.50	0.16 | 0.51	0.49 | 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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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	$\mathrm{sd}(\mu)/\sigma = 1$
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	$\mathrm{sd}(\mu)/\sigma = 1$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.08	0.10 | 0.01	0.00 | 0.00	0.79 | 0.23		$\rho = 0.5$
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.min	0.52 | 0.02	0.40 | 0.02	0.10 | 0.01	0.77 | 0.11	0.16 | 0.01	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.62 | 0.03	0.11 | 0.01	0.00 | 0.01	0.79 | 0.12		$\rho = 0.9$
AIC	0.89 | 0.80	0.88 | 0.78	0.89 | 0.75	0.80 | 0.20		
BIC	0.05 | 0.01	0.01 | 0.01	0.00 | 0.01	0.09 | 0.01		$\bar{s}_{Oracle}$ = 100.0

Table 114: **FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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 | 0.99	0.56 | 0.99	0.17 | 0.97	0.58 | 0.96	0.23 | 0.97	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 0.99	0.47 | 0.99	0.10 | 0.94	0.54 | 0.95		$\rho = 0$
AIC	0.87 | 1.00	0.87 | 0.99	0.87 | 0.98	0.67 | 0.97		
BIC	0.31 | 0.93	0.17 | 0.93	0.03 | 0.85	0.29 | 0.88		$\bar{s}_{Oracle}$ = 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 | 0.99	0.72 | 0.90	0.41 | 0.98	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.70 | 0.98	0.65 | 0.98	0.38 | 0.97	0.70 | 0.87		$\rho = 0.5$
AIC	0.87 | 1.00	0.87 | 1.00	0.86 | 1.00	0.74 | 0.91		
BIC	0.01 | 0.01	0.02 | 0.04	0.26 | 0.89	0.10 | 0.09		$\bar{s}_{Oracle}$ = 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 | 0.99	0.77 | 0.99	0.63 | 0.98	0.67 | 0.35	0.57 | 0.97	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.74 | 0.96	0.71 | 0.97	0.57 | 0.96	0.66 | 0.34		$\rho = 0.9$
AIC	0.80 | 0.99	0.79 | 1.00	0.77 | 1.00	0.66 | 0.35		
BIC	0.09 | 0.02	0.03 | 0.01	0.01 | 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	$\mathrm{sd}(\mu)/\sigma = 1$
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.54 | 0.06	0.05 | 0.00	0.00 | 0.00	0.79 | 0.21		$\rho = 0.5$
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.63 | 0.03	0.11 | 0.01	0.01 | 0.01	0.79 | 0.08		$\rho = 0.9$
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

Table 115: **FDR | Sensitivity for n=1000, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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 | 0.99	0.14 | 0.99	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 1.00	0.44 | 1.00	0.03 | 0.98	0.53 | 0.98		$\rho = 0$
AIC	0.87 | 1.00	0.87 | 1.00	0.87 | 0.99	0.68 | 0.99		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.83	0.48 | 0.78	0.43 | 0.67	0.58 | 0.82		$\rho = 0$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.63 | 0.46	0.61 | 0.62	0.60 | 0.73	0.71 | 0.59		$\rho = 0.5$
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.64 | 0.05	0.20 | 0.02	0.04 | 0.04	0.73 | 0.26		$\rho = 0.9$
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.min	0.48 | 0.22	0.15 | 0.04	0.04 | 0.01	0.73 | 0.50	0.49 | 0.22	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.54 | 0.25	0.13 | 0.07	0.00 | 0.00	0.69 | 0.42		$\rho = 0$
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.min	0.34 | 0.03	0.18 | 0.01	0.07 | 0.00	0.81 | 0.26	0.45 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.53 | 0.06	0.03 | 0.00	0.00 | 0.00	0.79 | 0.21		$\rho = 0.5$
AIC	0.90 | 0.92	0.90 | 0.90	0.90 | 0.90	0.86 | 0.69		
BIC	0.02 | 0.00	0.00 | 0.00	0.00 | 0.00	0.07 | 0.00		$\bar{s}_{Oracle}$ = 100.0
CV.1se	0.00 | 0.00	0.00 | 0.00	0.00 | 0.00	0.09 | 0.01	0.08 | 0.00	
CV.min	0.49 | 0.02	0.38 | 0.01	0.14 | 0.01	0.79 | 0.06	0.39 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.62 | 0.03	0.11 | 0.01	0.01 | 0.00	0.79 | 0.07		$\rho = 0.9$
AIC	0.89 | 0.86	0.89 | 0.83	0.89 | 0.82	0.81 | 0.17		
BIC	0.04 | 0.01	0.01 | 0.00	0.00 | 0.00	0.11 | 0.01		$\bar{s}_{Oracle}$ = 100.0

Table 116: **FDR | Sensitivity for n=100, binary design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 21.3
BIC	0.89 | 0.58	0.88 | 0.55	0.88 | 0.44	0.84 | 0.52		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 20.9
BIC	0.90 | 0.56	0.89 | 0.54	0.89 | 0.43	0.86 | 0.50		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.62 | 0.30	0.46 | 0.29	0.84 | 0.38	0.72 | 0.35		$\rho = 0.9$
AIC	0.90 | 0.55	0.89 | 0.52	0.89 | 0.41	0.89 | 0.49		$\bar{s}_{Oracle}$ = 20.7
BIC	0.90 | 0.55	0.89 | 0.52	0.89 | 0.40	0.86 | 0.48		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.55 | 0.23	0.46 | 0.21	0.93 | 0.29	0.78 | 0.34		$\rho = 0$
AIC	0.94 | 0.54	0.94 | 0.46	0.94 | 0.31	0.93 | 0.51		$\bar{s}_{Oracle}$ = 14.5
BIC	0.93 | 0.54	0.94 | 0.46	0.94 | 0.30	0.92 | 0.51		
CV.1se	0.08 | 0.03	0.05 | 0.02	0.02 | 0.02	0.86 | 0.40	0.15 | 0.04	
CV.min	0.56 | 0.22	0.34 | 0.13	0.12 | 0.05	0.92 | 0.47	0.51 | 0.20	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.20	0.45 | 0.17	0.93 | 0.28	0.80 | 0.31		$\rho = 0.5$
AIC	0.94 | 0.51	0.94 | 0.44	0.95 | 0.30	0.93 | 0.48		$\bar{s}_{Oracle}$ = 14.4
BIC	0.94 | 0.51	0.94 | 0.44	0.95 | 0.30	0.93 | 0.48		
CV.1se	0.08 | 0.03	0.06 | 0.03	0.02 | 0.02	0.86 | 0.38	0.17 | 0.05	
CV.min	0.58 | 0.21	0.35 | 0.12	0.13 | 0.05	0.92 | 0.46	0.53 | 0.19	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.19	0.42 | 0.16	0.93 | 0.27	0.81 | 0.30		$\rho = 0.9$
AIC	0.94 | 0.51	0.94 | 0.43	0.95 | 0.29	0.93 | 0.47		$\bar{s}_{Oracle}$ = 14.1
BIC	0.94 | 0.51	0.94 | 0.43	0.95 | 0.29	0.93 | 0.47		
CV.1se	0.03 | 0.01	0.01 | 0.00	0.01 | 0.00	0.94 | 0.34	0.30 | 0.02	
CV.min	0.43 | 0.10	0.22 | 0.03	0.10 | 0.01	0.96 | 0.42	0.55 | 0.10	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.11	0.79 | 0.19	0.98 | 0.20	0.91 | 0.23		$\rho = 0$
AIC	0.97 | 0.46	0.98 | 0.34	0.98 | 0.22	0.97 | 0.44		$\bar{s}_{Oracle}$ = 7.8
BIC	0.97 | 0.46	0.97 | 0.34	0.98 | 0.22	0.97 | 0.44		
CV.1se	0.03 | 0.01	0.02 | 0.01	0.02 | 0.00	0.94 | 0.32	0.30 | 0.01	
CV.min	0.43 | 0.09	0.23 | 0.03	0.12 | 0.01	0.96 | 0.40	0.58 | 0.09	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.09	0.75 | 0.16	0.98 | 0.18	0.90 | 0.23		$\rho = 0.5$
AIC	0.97 | 0.43	0.98 | 0.32	0.98 | 0.20	0.97 | 0.42		$\bar{s}_{Oracle}$ = 8.0
BIC	0.97 | 0.43	0.98 | 0.31	0.98 | 0.20	0.97 | 0.42		
CV.1se	0.03 | 0.01	0.03 | 0.00	0.02 | 0.00	0.94 | 0.32	0.31 | 0.02	
CV.min	0.45 | 0.10	0.21 | 0.03	0.10 | 0.02	0.97 | 0.39	0.61 | 0.10	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.10	0.71 | 0.17	0.98 | 0.19	0.92 | 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 117: **FDR | Sensitivity for n=100, binary design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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 | 0.01	0.08 | 0.01	0.84 | 0.25	0.53 | 0.08	$\mathrm{sd}(\mu)/\sigma = 2$
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 | 0.26		$\bar{s}_{Oracle}$ = 56.8
BIC	0.86 | 0.29	0.88 | 0.20	0.90 | 0.13	0.85 | 0.26		
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 | 0.00	0.84 | 0.23	0.50 | 0.06	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 56.2
BIC	0.87 | 0.28	0.88 | 0.20	0.91 | 0.12	0.86 | 0.25		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 56.5
BIC	0.87 | 0.27	0.89 | 0.19	0.91 | 0.12	0.86 | 0.24		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.52 | 0.04	0.90 | 0.13	0.94 | 0.11	0.84 | 0.11		$\rho = 0$
AIC	0.92 | 0.30	0.94 | 0.20	0.95 | 0.12	0.92 | 0.27		$\bar{s}_{Oracle}$ = 31.7
BIC	0.92 | 0.29	0.94 | 0.20	0.95 | 0.12	0.92 | 0.27		
CV.1se	0.03 | 0.00	0.03 | 0.00	0.01 | 0.00	0.89 | 0.17	0.27 | 0.01	
CV.min	0.43 | 0.04	0.21 | 0.01	0.08 | 0.00	0.92 | 0.23	0.54 | 0.04	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.52 | 0.04	0.90 | 0.12	0.94 | 0.11	0.85 | 0.11		$\rho = 0.5$
AIC	0.93 | 0.28	0.94 | 0.19	0.95 | 0.12	0.92 | 0.25		$\bar{s}_{Oracle}$ = 31.4
BIC	0.93 | 0.28	0.94 | 0.19	0.95 | 0.12	0.92 | 0.25		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.01 | 0.00	0.89 | 0.17	0.26 | 0.01	
CV.min	0.42 | 0.04	0.20 | 0.01	0.10 | 0.00	0.92 | 0.23	0.55 | 0.04	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.52 | 0.04	0.89 | 0.12	0.95 | 0.10	0.86 | 0.10		$\rho = 0.9$
AIC	0.93 | 0.27	0.94 | 0.19	0.95 | 0.12	0.93 | 0.25		$\bar{s}_{Oracle}$ = 31.0
BIC	0.93 | 0.27	0.94 | 0.18	0.95 | 0.12	0.93 | 0.24		
CV.1se	0.03 | 0.00	0.01 | 0.00	0.02 | 0.00	0.96 | 0.19	0.31 | 0.01	
CV.min	0.40 | 0.04	0.16 | 0.01	0.10 | 0.00	0.98 | 0.25	0.61 | 0.04	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	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		
CV.1se	0.01 | 0.00	0.02 | 0.00	0.01 | 0.00	0.97 | 0.18	0.34 | 0.01	
CV.min	0.42 | 0.03	0.16 | 0.01	0.10 | 0.00	0.98 | 0.24	0.59 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		

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

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 78.1
BIC	0.85 | 0.23	0.87 | 0.15	0.89 | 0.10	0.84 | 0.20		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 77.8
BIC	0.86 | 0.21	0.88 | 0.14	0.89 | 0.10	0.85 | 0.19		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.51 | 0.02	0.84 | 0.09	0.89 | 0.08	0.77 | 0.06		$\rho = 0.9$
AIC	0.86 | 0.21	0.88 | 0.14	0.89 | 0.10	0.85 | 0.19		$\bar{s}_{Oracle}$ = 77.2
BIC	0.86 | 0.21	0.88 | 0.14	0.89 | 0.09	0.85 | 0.18		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.55 | 0.03	0.93 | 0.10	0.94 | 0.09	0.86 | 0.07		$\rho = 0$
AIC	0.93 | 0.23	0.94 | 0.15	0.95 | 0.10	0.92 | 0.21		$\bar{s}_{Oracle}$ = 38.0
BIC	0.93 | 0.23	0.94 | 0.14	0.95 | 0.10	0.92 | 0.21		
CV.1se	0.04 | 0.00	0.02 | 0.00	0.02 | 0.00	0.90 | 0.13	0.33 | 0.00	
CV.min	0.42 | 0.03	0.18 | 0.00	0.08 | 0.00	0.92 | 0.19	0.59 | 0.03	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.52 | 0.02	0.93 | 0.10	0.95 | 0.09	0.88 | 0.07		$\rho = 0.5$
AIC	0.93 | 0.23	0.94 | 0.15	0.95 | 0.10	0.93 | 0.20		$\bar{s}_{Oracle}$ = 36.9
BIC	0.93 | 0.23	0.94 | 0.15	0.95 | 0.10	0.93 | 0.20		
CV.1se	0.03 | 0.00	0.01 | 0.00	0.02 | 0.00	0.90 | 0.13	0.29 | 0.01	
CV.min	0.45 | 0.03	0.19 | 0.00	0.10 | 0.00	0.92 | 0.18	0.58 | 0.03	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.02	0.93 | 0.10	0.95 | 0.09	0.87 | 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		
CV.1se	0.02 | 0.00	0.01 | 0.00	0.02 | 0.00	0.97 | 0.15	0.34 | 0.00	
CV.min	0.41 | 0.03	0.15 | 0.00	0.09 | 0.00	0.98 | 0.21	0.62 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.02 | 0.00	0.01 | 0.00	0.01 | 0.00	0.97 | 0.15	0.35 | 0.01	
CV.min	0.43 | 0.02	0.15 | 0.00	0.09 | 0.00	0.98 | 0.20	0.61 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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 | 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 | 0.10	0.96 | 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		

Table 119: **FDR | Sensitivity for n=100, binary design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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 | 0.00	0.09 | 0.00	0.85 | 0.14	0.57 | 0.03	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.50 | 0.02	0.86 | 0.07	0.88 | 0.07	0.79 | 0.05		$\rho = 0$
AIC	0.86 | 0.18	0.88 | 0.12	0.89 | 0.08	0.85 | 0.16		$\bar{s}_{Oracle}$ = 91.2
BIC	0.86 | 0.18	0.88 | 0.12	0.89 | 0.08	0.85 | 0.15		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.50 | 0.01	0.87 | 0.07	0.89 | 0.07	0.79 | 0.05		$\rho = 0.5$
AIC	0.86 | 0.18	0.88 | 0.12	0.89 | 0.08	0.86 | 0.15		$\bar{s}_{Oracle}$ = 90.8
BIC	0.86 | 0.18	0.88 | 0.12	0.89 | 0.08	0.86 | 0.15		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 90.3
BIC	0.86 | 0.17	0.88 | 0.11	0.89 | 0.08	0.86 | 0.15		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.55 | 0.02	0.94 | 0.08	0.95 | 0.08	0.90 | 0.06		$\rho = 0$
AIC	0.94 | 0.20	0.94 | 0.12	0.95 | 0.08	0.93 | 0.17		$\bar{s}_{Oracle}$ = 41.6
BIC	0.94 | 0.20	0.95 | 0.12	0.95 | 0.08	0.93 | 0.17		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.02	0.94 | 0.08	0.95 | 0.08	0.90 | 0.05		$\rho = 0.5$
AIC	0.94 | 0.20	0.94 | 0.12	0.95 | 0.09	0.94 | 0.17		$\bar{s}_{Oracle}$ = 41.3
BIC	0.94 | 0.19	0.94 | 0.12	0.95 | 0.09	0.94 | 0.17		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.02	0.94 | 0.08	0.95 | 0.08	0.90 | 0.06		$\rho = 0.9$
AIC	0.94 | 0.20	0.95 | 0.13	0.95 | 0.09	0.94 | 0.17		$\bar{s}_{Oracle}$ = 40.7
BIC	0.94 | 0.20	0.95 | 0.12	0.95 | 0.09	0.94 | 0.17		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.02	0.99 | 0.08	0.99 | 0.08	0.97 | 0.06		$\rho = 0$
AIC	0.99 | 0.24	0.99 | 0.11	0.99 | 0.08	0.99 | 0.20		$\bar{s}_{Oracle}$ = 5.1
BIC	0.99 | 0.24	0.99 | 0.10	0.99 | 0.08	0.99 | 0.20		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 5.6
BIC	0.99 | 0.21	0.99 | 0.12	0.99 | 0.09	0.99 | 0.20		
CV.1se	0.02 | 0.00	0.01 | 0.00	0.01 | 0.00	0.97 | 0.13	0.35 | 0.01	
CV.min	0.44 | 0.02	0.17 | 0.01	0.09 | 0.00	0.99 | 0.19	0.65 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.58 | 0.03	0.99 | 0.10	0.99 | 0.09	0.97 | 0.07		$\rho = 0.9$
AIC	0.99 | 0.23	0.99 | 0.13	0.99 | 0.10	0.99 | 0.21		$\bar{s}_{Oracle}$ = 5.2
BIC	0.99 | 0.23	0.99 | 0.12	0.99 | 0.10	0.99 | 0.21		

Table 120: **FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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 | 0.19	0.84 | 0.52	0.52 | 0.39	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.58 | 0.37	0.24 | 0.25	0.80 | 0.41	0.67 | 0.40		$\rho = 0$
AIC	0.89 | 0.59	0.88 | 0.56	0.88 | 0.44	0.87 | 0.54		$\bar{s}_{Oracle}$ = 20.7
BIC	0.89 | 0.59	0.88 | 0.56	0.88 | 0.44	0.84 | 0.53		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 20.4
BIC	0.94 | 0.33	0.94 | 0.32	0.94 | 0.25	0.86 | 0.26		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.65 | 0.08	0.14 | 0.06	0.00 | 0.06	0.76 | 0.22		$\rho = 0.9$
AIC	0.97 | 0.19	0.97 | 0.17	0.97 | 0.14	0.86 | 0.44		$\bar{s}_{Oracle}$ = 18.3
BIC	0.84 | 0.16	0.87 | 0.16	0.97 | 0.14	0.26 | 0.09		
CV.1se	0.09 | 0.05	0.05 | 0.04	0.02 | 0.02	0.84 | 0.42	0.12 | 0.05	
CV.min	0.54 | 0.24	0.33 | 0.14	0.10 | 0.06	0.91 | 0.50	0.50 | 0.23	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.23	0.11 | 0.07	0.93 | 0.28	0.78 | 0.34		$\rho = 0$
AIC	0.93 | 0.55	0.94 | 0.46	0.94 | 0.31	0.93 | 0.51		$\bar{s}_{Oracle}$ = 14.4
BIC	0.93 | 0.54	0.94 | 0.46	0.94 | 0.30	0.92 | 0.51		
CV.1se	0.04 | 0.01	0.03 | 0.01	0.02 | 0.01	0.89 | 0.19	0.15 | 0.03	
CV.min	0.50 | 0.09	0.37 | 0.06	0.13 | 0.03	0.95 | 0.26	0.47 | 0.08	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.06 | 0.08	0.04 | 0.08	0.01 | 0.09	0.44 | 0.14	0.01 | 0.09	
CV.min	0.64 | 0.14	0.51 | 0.11	0.14 | 0.10	0.86 | 0.24	0.22 | 0.11	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.65 | 0.13	0.13 | 0.10	0.02 | 0.10	0.80 | 0.17		$\rho = 0.9$
AIC	0.98 | 0.23	0.98 | 0.20	0.98 | 0.17	0.93 | 0.49		$\bar{s}_{Oracle}$ = 11.6
BIC	0.97 | 0.22	0.98 | 0.20	0.98 | 0.16	0.31 | 0.13		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 7.9
BIC	0.97 | 0.46	0.98 | 0.34	0.98 | 0.21	0.97 | 0.45		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 7.6
BIC	0.98 | 0.31	0.98 | 0.25	0.99 | 0.17	0.98 | 0.30		
CV.1se	0.03 | 0.04	0.03 | 0.04	0.01 | 0.05	0.57 | 0.27	0.15 | 0.11	
CV.min	0.51 | 0.25	0.40 | 0.21	0.15 | 0.14	0.92 | 0.37	0.48 | 0.24	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.63 | 0.28	0.10 | 0.13	0.66 | 0.24	0.88 | 0.34		$\rho = 0.9$
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 121: **FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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 | 0.08	0.20 | 0.01	0.09 | 0.00	0.83 | 0.25	0.51 | 0.07	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 57.2
BIC	0.86 | 0.29	0.88 | 0.20	0.90 | 0.12	0.84 | 0.26		
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 | 0.00	0.90 | 0.13	0.52 | 0.02	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 57.0
BIC	0.91 | 0.18	0.92 | 0.15	0.93 | 0.10	0.91 | 0.16		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 55.0
BIC	0.93 | 0.14	0.93 | 0.12	0.93 | 0.09	0.50 | 0.05		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.54 | 0.05	0.60 | 0.08	0.94 | 0.12	0.84 | 0.12		$\rho = 0$
AIC	0.93 | 0.30	0.94 | 0.20	0.95 | 0.13	0.92 | 0.27		$\bar{s}_{Oracle}$ = 30.6
BIC	0.93 | 0.30	0.94 | 0.20	0.95 | 0.13	0.92 | 0.27		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 30.4
BIC	0.95 | 0.19	0.95 | 0.15	0.96 | 0.10	0.95 | 0.17		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.04	0.09 | 0.01	0.83 | 0.08	0.85 | 0.07		$\rho = 0.9$
AIC	0.96 | 0.16	0.96 | 0.14	0.96 | 0.11	0.95 | 0.20		$\bar{s}_{Oracle}$ = 27.7
BIC	0.96 | 0.16	0.96 | 0.14	0.96 | 0.11	0.66 | 0.10		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.02 | 0.00	0.96 | 0.19	0.30 | 0.00	
CV.min	0.43 | 0.04	0.17 | 0.00	0.10 | 0.00	0.98 | 0.24	0.60 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.03	0.93 | 0.12	0.98 | 0.11	0.95 | 0.11		$\rho = 0$
AIC	0.98 | 0.29	0.98 | 0.18	0.99 | 0.11	0.98 | 0.26		$\bar{s}_{Oracle}$ = 8.7
BIC	0.98 | 0.29	0.98 | 0.18	0.99 | 0.11	0.98 | 0.26		
CV.1se	0.02 | 0.00	0.01 | 0.00	0.01 | 0.00	0.95 | 0.12	0.32 | 0.00	
CV.min	0.40 | 0.02	0.19 | 0.00	0.11 | 0.00	0.98 | 0.17	0.59 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.03	0.50 | 0.05	0.99 | 0.10	0.96 | 0.08		$\rho = 0.5$
AIC	0.98 | 0.23	0.99 | 0.16	0.99 | 0.11	0.98 | 0.20		$\bar{s}_{Oracle}$ = 8.5
BIC	0.98 | 0.23	0.99 | 0.16	0.99 | 0.11	0.98 | 0.20		
CV.1se	0.01 | 0.00	0.02 | 0.00	0.01 | 0.00	0.58 | 0.10	0.31 | 0.01	
CV.min	0.42 | 0.07	0.27 | 0.04	0.12 | 0.01	0.94 | 0.20	0.60 | 0.07	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.08	0.07 | 0.01	0.98 | 0.18	0.92 | 0.16		$\rho = 0.9$
AIC	0.99 | 0.28	0.99 | 0.23	0.99 | 0.20	0.98 | 0.30		$\bar{s}_{Oracle}$ = 7.3
BIC	0.99 | 0.28	0.99 | 0.23	0.99 | 0.20	0.84 | 0.21		

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

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.48 | 0.03	0.67 | 0.07	0.88 | 0.09	0.74 | 0.07		$\rho = 0$
AIC	0.85 | 0.23	0.87 | 0.15	0.89 | 0.10	0.84 | 0.20		$\bar{s}_{Oracle}$ = 77.5
BIC	0.85 | 0.22	0.87 | 0.15	0.89 | 0.10	0.84 | 0.20		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 77.5
BIC	0.90 | 0.15	0.90 | 0.12	0.91 | 0.09	0.89 | 0.13		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 76.0
BIC	0.91 | 0.13	0.92 | 0.11	0.92 | 0.09	0.67 | 0.06		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 37.7
BIC	0.93 | 0.23	0.94 | 0.15	0.95 | 0.10	0.92 | 0.21		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.53 | 0.01	0.38 | 0.03	0.96 | 0.07	0.92 | 0.04		$\rho = 0.5$
AIC	0.95 | 0.17	0.95 | 0.13	0.96 | 0.09	0.95 | 0.15		$\bar{s}_{Oracle}$ = 37.2
BIC	0.95 | 0.17	0.95 | 0.12	0.96 | 0.08	0.95 | 0.15		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.53 | 0.02	0.07 | 0.00	0.95 | 0.08	0.88 | 0.04		$\rho = 0.9$
AIC	0.96 | 0.15	0.96 | 0.12	0.96 | 0.10	0.95 | 0.16		$\bar{s}_{Oracle}$ = 34.6
BIC	0.96 | 0.15	0.96 | 0.12	0.96 | 0.10	0.74 | 0.09		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.02 | 0.00	0.97 | 0.15	0.34 | 0.00	
CV.min	0.45 | 0.03	0.16 | 0.00	0.10 | 0.00	0.98 | 0.20	0.63 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.59 | 0.03	0.98 | 0.10	0.99 | 0.10	0.96 | 0.08		$\rho = 0$
AIC	0.99 | 0.25	0.99 | 0.14	0.99 | 0.10	0.98 | 0.22		$\bar{s}_{Oracle}$ = 6.8
BIC	0.98 | 0.25	0.99 | 0.14	0.99 | 0.10	0.98 | 0.22		
CV.1se	0.03 | 0.00	0.01 | 0.00	0.01 | 0.00	0.95 | 0.10	0.34 | 0.00	
CV.min	0.39 | 0.02	0.18 | 0.00	0.10 | 0.00	0.99 | 0.17	0.63 | 0.02	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.02	0.82 | 0.07	0.99 | 0.09	0.96 | 0.06		$\rho = 0.5$
AIC	0.99 | 0.22	0.99 | 0.15	0.99 | 0.10	0.99 | 0.20		$\bar{s}_{Oracle}$ = 6.7
BIC	0.99 | 0.22	0.99 | 0.14	0.99 | 0.10	0.99 | 0.20		
CV.1se	0.01 | 0.00	0.01 | 0.00	0.01 | 0.00	0.57 | 0.07	0.31 | 0.00	
CV.min	0.41 | 0.04	0.23 | 0.01	0.11 | 0.00	0.95 | 0.16	0.60 | 0.04	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.04	0.06 | 0.00	0.99 | 0.15	0.94 | 0.11		$\rho = 0.9$
AIC	0.99 | 0.24	0.99 | 0.20	0.99 | 0.16	0.99 | 0.26		$\bar{s}_{Oracle}$ = 6.4
BIC	0.99 | 0.24	0.99 | 0.20	0.99 | 0.16	0.86 | 0.17		

Table 123: **FDR | Sensitivity for n=100, continuous design, dense covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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 | 0.00	0.85 | 0.14	0.57 | 0.03	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.51 | 0.02	0.83 | 0.07	0.89 | 0.07	0.79 | 0.05		$\rho = 0$
AIC	0.86 | 0.18	0.88 | 0.12	0.89 | 0.08	0.85 | 0.16		$\bar{s}_{Oracle}$ = 91.1
BIC	0.86 | 0.18	0.88 | 0.12	0.89 | 0.08	0.85 | 0.16		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 91.1
BIC	0.89 | 0.14	0.90 | 0.10	0.90 | 0.08	0.89 | 0.12		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 90.5
BIC	0.90 | 0.12	0.90 | 0.10	0.90 | 0.08	0.75 | 0.06		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.02	0.94 | 0.08	0.95 | 0.08	0.90 | 0.06		$\rho = 0$
AIC	0.94 | 0.20	0.94 | 0.12	0.95 | 0.08	0.93 | 0.18		$\bar{s}_{Oracle}$ = 41.2
BIC	0.94 | 0.20	0.95 | 0.12	0.95 | 0.08	0.93 | 0.18		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.54 | 0.01	0.71 | 0.05	0.95 | 0.07	0.92 | 0.04		$\rho = 0.5$
AIC	0.95 | 0.16	0.95 | 0.11	0.95 | 0.08	0.95 | 0.13		$\bar{s}_{Oracle}$ = 41.3
BIC	0.95 | 0.16	0.95 | 0.11	0.95 | 0.08	0.95 | 0.13		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.54 | 0.02	0.06 | 0.00	0.95 | 0.08	0.89 | 0.04		$\rho = 0.9$
AIC	0.95 | 0.15	0.95 | 0.12	0.96 | 0.10	0.95 | 0.15		$\bar{s}_{Oracle}$ = 39.9
BIC	0.95 | 0.15	0.95 | 0.12	0.96 | 0.10	0.80 | 0.09		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.58 | 0.02	0.99 | 0.09	0.99 | 0.08	0.97 | 0.06		$\rho = 0$
AIC	0.99 | 0.21	0.99 | 0.13	0.99 | 0.08	0.99 | 0.18		$\bar{s}_{Oracle}$ = 5.4
BIC	0.99 | 0.20	0.99 | 0.12	0.99 | 0.08	0.99 | 0.18		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.01	0.97 | 0.07	0.99 | 0.08	0.96 | 0.05		$\rho = 0.5$
AIC	0.99 | 0.21	0.99 | 0.12	0.99 | 0.09	0.99 | 0.18		$\bar{s}_{Oracle}$ = 5.5
BIC	0.99 | 0.21	0.99 | 0.12	0.99 | 0.08	0.99 | 0.18		
CV.1se	0.01 | 0.00	0.01 | 0.00	0.01 | 0.00	0.57 | 0.04	0.33 | 0.00	
CV.min	0.40 | 0.02	0.23 | 0.01	0.11 | 0.00	0.97 | 0.12	0.61 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.03	0.11 | 0.01	0.99 | 0.13	0.94 | 0.08		$\rho = 0.9$
AIC	0.99 | 0.23	0.99 | 0.18	0.99 | 0.15	0.99 | 0.22		$\bar{s}_{Oracle}$ = 5.3
BIC	0.99 | 0.23	0.99 | 0.18	0.99 | 0.15	0.86 | 0.14		

Table 124: **FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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 | 0.88	0.65 | 0.86	0.21 | 0.67	0.85 | 0.87	0.46 | 0.82	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.64 | 0.80	0.47 | 0.81	0.80 | 0.88	0.69 | 0.79		$\rho = 0$
AIC	0.91 | 0.93	0.90 | 0.92	0.88 | 0.88	0.89 | 0.88		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.92	0.90 | 0.92	0.88 | 0.88	0.82 | 0.85		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.91	0.90 | 0.91	0.88 | 0.87	0.85 | 0.84		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.66 | 0.69	0.52 | 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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.92 | 0.89	0.91 | 0.89	0.89 | 0.83	0.85 | 0.81		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.59 | 0.35	0.44 | 0.29	0.92 | 0.39	0.78 | 0.48		$\rho = 0$
AIC	0.94 | 0.66	0.94 | 0.58	0.94 | 0.42	0.93 | 0.64		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.66	0.94 | 0.58	0.94 | 0.42	0.93 | 0.63		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.60 | 0.30	0.43 | 0.25	0.93 | 0.38	0.79 | 0.42		$\rho = 0.5$
AIC	0.94 | 0.63	0.94 | 0.56	0.95 | 0.40	0.94 | 0.60		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.63	0.94 | 0.55	0.95 | 0.40	0.93 | 0.59		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.60 | 0.28	0.43 | 0.23	0.93 | 0.36	0.81 | 0.40		$\rho = 0.9$
AIC	0.94 | 0.61	0.94 | 0.55	0.95 | 0.38	0.94 | 0.58		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.61	0.94 | 0.54	0.95 | 0.38	0.93 | 0.58		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.07	0.73 | 0.13	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 | 0.34		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.36	0.97 | 0.27	0.98 | 0.17	0.96 | 0.34		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.01 | 0.00	0.93 | 0.23	0.32 | 0.01	
CV.min	0.44 | 0.06	0.24 | 0.02	0.11 | 0.01	0.96 | 0.29	0.59 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.06	0.70 | 0.11	0.97 | 0.14	0.91 | 0.15		$\rho = 0.5$
AIC	0.97 | 0.34	0.97 | 0.25	0.98 | 0.16	0.97 | 0.31		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.33	0.97 | 0.25	0.98 | 0.16	0.97 | 0.31		
CV.1se	0.03 | 0.01	0.02 | 0.00	0.01 | 0.00	0.94 | 0.21	0.30 | 0.01	
CV.min	0.46 | 0.06	0.23 | 0.02	0.12 | 0.01	0.96 | 0.27	0.60 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.06	0.65 | 0.10	0.97 | 0.14	0.92 | 0.14		$\rho = 0.9$
AIC	0.97 | 0.32	0.97 | 0.25	0.98 | 0.16	0.97 | 0.30		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.32	0.97 | 0.24	0.98 | 0.16	0.97 | 0.29		

Table 125: **FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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 | 0.94	0.61 | 0.91	0.18 | 0.53	0.85 | 0.95	0.65 | 0.93	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.63 | 0.88	0.47 | 0.92	0.81 | 0.90	0.68 | 0.88		$\rho = 0$
AIC	0.91 | 0.98	0.90 | 0.98	0.87 | 0.91	0.89 | 0.96		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.98	0.90 | 0.98	0.87 | 0.91	0.87 | 0.95		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.97	0.90 | 0.97	0.88 | 0.89	0.88 | 0.94		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.95	0.90 | 0.95	0.88 | 0.84	0.89 | 0.91		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.32	0.61 | 0.36	0.93 | 0.37	0.78 | 0.49		$\rho = 0$
AIC	0.94 | 0.70	0.94 | 0.57	0.95 | 0.39	0.93 | 0.68		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.70	0.94 | 0.57	0.95 | 0.38	0.93 | 0.68		
CV.1se	0.08 | 0.04	0.04 | 0.03	0.01 | 0.01	0.86 | 0.55	0.16 | 0.05	
CV.min	0.56 | 0.30	0.28 | 0.13	0.10 | 0.05	0.92 | 0.62	0.54 | 0.28	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.27	0.60 | 0.31	0.94 | 0.33	0.79 | 0.43		$\rho = 0.5$
AIC	0.94 | 0.67	0.94 | 0.55	0.95 | 0.35	0.93 | 0.64		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.67	0.94 | 0.54	0.95 | 0.35	0.93 | 0.64		
CV.1se	0.08 | 0.04	0.04 | 0.02	0.02 | 0.01	0.87 | 0.51	0.19 | 0.06	
CV.min	0.56 | 0.28	0.29 | 0.12	0.11 | 0.04	0.92 | 0.59	0.56 | 0.26	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.25	0.59 | 0.28	0.94 | 0.33	0.81 | 0.41		$\rho = 0.9$
AIC	0.94 | 0.65	0.94 | 0.53	0.95 | 0.35	0.93 | 0.62		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.65	0.94 | 0.53	0.95 | 0.35	0.93 | 0.61		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.01 | 0.00	0.93 | 0.26	0.29 | 0.01	
CV.min	0.44 | 0.06	0.20 | 0.01	0.10 | 0.01	0.96 | 0.32	0.56 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.01 | 0.00	0.94 | 0.23	0.32 | 0.01	
CV.min	0.43 | 0.05	0.19 | 0.01	0.10 | 0.01	0.96 | 0.30	0.59 | 0.05	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.58 | 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 | 0.30		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.33	0.98 | 0.22	0.98 | 0.15	0.97 | 0.30		

Table 126: **FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.98	0.89 | 0.98	0.87 | 0.90	0.87 | 0.96		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.97	0.90 | 0.97	0.88 | 0.88	0.88 | 0.94		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.64 | 0.75	0.55 | 0.85	0.83 | 0.82	0.72 | 0.80		$\rho = 0.9$
AIC	0.91 | 0.96	0.90 | 0.95	0.89 | 0.83	0.90 | 0.92		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.95	0.90 | 0.95	0.88 | 0.83	0.88 | 0.92		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.55 | 0.32	0.65 | 0.38	0.93 | 0.37	0.78 | 0.49		$\rho = 0$
AIC	0.94 | 0.71	0.94 | 0.57	0.95 | 0.38	0.93 | 0.69		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.71	0.94 | 0.57	0.95 | 0.38	0.93 | 0.68		
CV.1se	0.07 | 0.04	0.04 | 0.03	0.01 | 0.01	0.86 | 0.55	0.18 | 0.05	
CV.min	0.56 | 0.30	0.27 | 0.12	0.10 | 0.05	0.92 | 0.63	0.55 | 0.28	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.27	0.62 | 0.33	0.94 | 0.34	0.79 | 0.44		$\rho = 0.5$
AIC	0.94 | 0.67	0.94 | 0.54	0.95 | 0.36	0.93 | 0.64		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.67	0.94 | 0.54	0.95 | 0.36	0.93 | 0.64		
CV.1se	0.08 | 0.04	0.04 | 0.02	0.02 | 0.01	0.87 | 0.52	0.17 | 0.05	
CV.min	0.56 | 0.28	0.28 | 0.12	0.09 | 0.04	0.92 | 0.59	0.55 | 0.26	$\mathrm{sd}(\mu)/\sigma = 1$
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		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.01 | 0.00	0.93 | 0.26	0.30 | 0.01	
CV.min	0.44 | 0.06	0.21 | 0.01	0.10 | 0.01	0.96 | 0.32	0.57 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.01 | 0.00	0.94 | 0.23	0.30 | 0.01	
CV.min	0.43 | 0.05	0.18 | 0.01	0.10 | 0.01	0.96 | 0.30	0.59 | 0.05	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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 | 0.05	$\mathrm{sd}(\mu)/\sigma = 0.5$
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 | 0.30		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.33	0.98 | 0.22	0.98 | 0.14	0.97 | 0.30		

Table 127: **FDR | Sensitivity for n=100, binary design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.98	0.89 | 0.98	0.87 | 0.90	0.87 | 0.96		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.97	0.90 | 0.97	0.87 | 0.88	0.88 | 0.94		
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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.64 | 0.74	0.55 | 0.85	0.83 | 0.82	0.72 | 0.80		$\rho = 0.9$
AIC	0.91 | 0.96	0.90 | 0.95	0.89 | 0.83	0.90 | 0.92		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.95	0.90 | 0.95	0.88 | 0.83	0.89 | 0.92		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.55 | 0.32	0.67 | 0.38	0.93 | 0.37	0.78 | 0.49		$\rho = 0$
AIC	0.94 | 0.71	0.94 | 0.57	0.95 | 0.38	0.93 | 0.68		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.70	0.94 | 0.57	0.95 | 0.38	0.93 | 0.68		
CV.1se	0.08 | 0.04	0.04 | 0.03	0.02 | 0.01	0.87 | 0.54	0.17 | 0.05	
CV.min	0.55 | 0.30	0.27 | 0.12	0.10 | 0.04	0.92 | 0.62	0.53 | 0.28	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.26	0.64 | 0.33	0.94 | 0.34	0.79 | 0.43		$\rho = 0.5$
AIC	0.94 | 0.67	0.94 | 0.54	0.95 | 0.35	0.93 | 0.64		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.67	0.94 | 0.54	0.95 | 0.35	0.93 | 0.64		
CV.1se	0.08 | 0.04	0.04 | 0.02	0.02 | 0.01	0.87 | 0.52	0.19 | 0.05	
CV.min	0.56 | 0.28	0.28 | 0.11	0.10 | 0.04	0.92 | 0.60	0.56 | 0.25	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.24	0.64 | 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		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.02 | 0.00	0.94 | 0.26	0.28 | 0.01	
CV.min	0.43 | 0.06	0.20 | 0.01	0.10 | 0.01	0.96 | 0.32	0.58 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.01 | 0.00	0.94 | 0.23	0.31 | 0.01	
CV.min	0.43 | 0.05	0.18 | 0.01	0.10 | 0.01	0.96 | 0.30	0.58 | 0.05	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		
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	0.21 | 0.01	0.10 | 0.01	0.96 | 0.28	0.61 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		

Table 128: **FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 10**.

	lasso	GL $\gamma = 1$	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 | 0.87	0.64 | 0.85	0.18 | 0.64	0.85 | 0.87	0.44 | 0.81	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.63 | 0.79	0.34 | 0.73	0.65 | 0.81	0.69 | 0.79		$\rho = 0$
AIC	0.91 | 0.92	0.90 | 0.92	0.88 | 0.88	0.89 | 0.88		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.92	0.90 | 0.92	0.88 | 0.88	0.81 | 0.85		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.95 | 0.57	0.94 | 0.56	0.94 | 0.48	0.83 | 0.42		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.93 | 0.27	0.95 | 0.26	0.97 | 0.23	0.34 | 0.13		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.60 | 0.36	0.14 | 0.14	0.92 | 0.41	0.77 | 0.47		$\rho = 0$
AIC	0.94 | 0.66	0.94 | 0.57	0.94 | 0.42	0.93 | 0.63		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.65	0.94 | 0.57	0.94 | 0.42	0.92 | 0.63		
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	$\mathrm{sd}(\mu)/\sigma = 1$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.96 | 0.38	0.97 | 0.34	0.97 | 0.25	0.94 | 0.34		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.68 | 0.12	0.16 | 0.10	0.03 | 0.09	0.84 | 0.14		$\rho = 0.9$
AIC	0.98 | 0.24	0.98 | 0.22	0.98 | 0.18	0.95 | 0.41		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.24	0.98 | 0.22	0.98 | 0.18	0.38 | 0.12		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.35	0.97 | 0.26	0.98 | 0.17	0.96 | 0.33		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.57 | 0.04	0.08 | 0.01	0.98 | 0.11	0.93 | 0.09		$\rho = 0.5$
AIC	0.98 | 0.23	0.98 | 0.19	0.98 | 0.13	0.98 | 0.21		$\bar{s}_{Oracle}$ = 10.0
BIC	0.98 | 0.23	0.98 | 0.18	0.98 | 0.13	0.98 | 0.21		
CV.1se	0.03 | 0.01	0.03 | 0.01	0.01 | 0.01	0.58 | 0.07	0.18 | 0.02	
CV.min	0.48 | 0.06	0.39 | 0.05	0.16 | 0.03	0.93 | 0.13	0.51 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.61 | 0.07	0.10 | 0.03	0.69 | 0.09	0.89 | 0.10		$\rho = 0.9$
AIC	0.98 | 0.21	0.98 | 0.18	0.98 | 0.14	0.97 | 0.25		$\bar{s}_{Oracle}$ = 10.0
BIC	0.98 | 0.21	0.98 | 0.18	0.98 | 0.14	0.67 | 0.13		

Table 129: **FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 50**.

	lasso	GL $\gamma = 1$	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	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.63 | 0.87	0.33 | 0.83	0.76 | 0.89	0.68 | 0.88		$\rho = 0$
AIC	0.91 | 0.97	0.90 | 0.97	0.87 | 0.90	0.89 | 0.95		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.97	0.90 | 0.97	0.87 | 0.90	0.86 | 0.94		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.95 | 0.60	0.94 | 0.55	0.95 | 0.40	0.93 | 0.52		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.32	0.97 | 0.29	0.97 | 0.23	0.61 | 0.19		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.33	0.16 | 0.12	0.93 | 0.38	0.77 | 0.49		$\rho = 0$
AIC	0.94 | 0.69	0.94 | 0.57	0.95 | 0.39	0.93 | 0.67		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.69	0.94 | 0.57	0.94 | 0.39	0.92 | 0.67		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.10	0.12 | 0.03	0.96 | 0.19	0.88 | 0.20		$\rho = 0.5$
AIC	0.96 | 0.40	0.97 | 0.34	0.97 | 0.22	0.96 | 0.37		$\bar{s}_{Oracle}$ = 10.0
BIC	0.96 | 0.40	0.97 | 0.34	0.97 | 0.22	0.96 | 0.37		
CV.1se	0.09 | 0.03	0.09 | 0.03	0.05 | 0.03	0.68 | 0.13	0.17 | 0.05	
CV.min	0.60 | 0.12	0.54 | 0.10	0.24 | 0.07	0.92 | 0.20	0.50 | 0.11	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.68 | 0.12	0.16 | 0.05	0.46 | 0.10	0.88 | 0.16		$\rho = 0.9$
AIC	0.98 | 0.28	0.98 | 0.24	0.98 | 0.19	0.96 | 0.32		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.28	0.98 | 0.24	0.97 | 0.19	0.68 | 0.17		
CV.1se	0.03 | 0.01	0.02 | 0.00	0.02 | 0.00	0.93 | 0.25	0.25 | 0.01	
CV.min	0.42 | 0.07	0.21 | 0.02	0.11 | 0.01	0.96 | 0.32	0.55 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.07	0.51 | 0.09	0.97 | 0.14	0.90 | 0.17		$\rho = 0$
AIC	0.97 | 0.36	0.97 | 0.25	0.98 | 0.16	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		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.01 | 0.00	0.93 | 0.13	0.28 | 0.01	
CV.min	0.44 | 0.03	0.26 | 0.01	0.13 | 0.00	0.97 | 0.19	0.59 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.03	0.12 | 0.01	0.98 | 0.10	0.93 | 0.08		$\rho = 0.5$
AIC	0.98 | 0.24	0.98 | 0.18	0.98 | 0.12	0.98 | 0.21		$\bar{s}_{Oracle}$ = 10.0
BIC	0.98 | 0.23	0.98 | 0.18	0.98 | 0.12	0.98 | 0.21		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.02 | 0.00	0.62 | 0.05	0.30 | 0.01	
CV.min	0.45 | 0.03	0.33 | 0.02	0.15 | 0.01	0.94 | 0.11	0.61 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 | 0.04	0.08 | 0.00	0.95 | 0.11	0.91 | 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 130: **FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 100**.

	lasso	GL $\gamma = 1$	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 | 0.89	0.17 | 0.52	0.84 | 0.94	0.62 | 0.91	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.63 | 0.87	0.33 | 0.84	0.78 | 0.89	0.69 | 0.89		$\rho = 0$
AIC	0.91 | 0.97	0.90 | 0.97	0.87 | 0.90	0.89 | 0.95		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.97	0.90 | 0.97	0.87 | 0.90	0.86 | 0.95		
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 | 0.07	0.93 | 0.50	0.50 | 0.22	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.62 | 0.22	0.14 | 0.09	0.91 | 0.36	0.83 | 0.33		$\rho = 0.5$
AIC	0.95 | 0.60	0.94 | 0.55	0.95 | 0.39	0.94 | 0.54		$\bar{s}_{Oracle}$ = 10.0
BIC	0.95 | 0.60	0.94 | 0.55	0.95 | 0.39	0.93 | 0.52		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.32	0.97 | 0.29	0.97 | 0.23	0.64 | 0.20		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.33	0.18 | 0.12	0.93 | 0.37	0.77 | 0.49		$\rho = 0$
AIC	0.94 | 0.70	0.94 | 0.56	0.95 | 0.39	0.93 | 0.67		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.69	0.94 | 0.56	0.94 | 0.39	0.93 | 0.67		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.57 | 0.10	0.11 | 0.02	0.96 | 0.19	0.88 | 0.20		$\rho = 0.5$
AIC	0.96 | 0.40	0.97 | 0.34	0.97 | 0.21	0.96 | 0.37		$\bar{s}_{Oracle}$ = 10.0
BIC	0.96 | 0.40	0.97 | 0.33	0.97 | 0.21	0.96 | 0.37		
CV.1se	0.09 | 0.02	0.10 | 0.02	0.05 | 0.03	0.70 | 0.13	0.22 | 0.05	
CV.min	0.59 | 0.11	0.53 | 0.09	0.25 | 0.06	0.92 | 0.20	0.54 | 0.11	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.68 | 0.12	0.17 | 0.04	0.56 | 0.12	0.88 | 0.16		$\rho = 0.9$
AIC	0.97 | 0.28	0.98 | 0.24	0.98 | 0.19	0.96 | 0.31		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.28	0.98 | 0.24	0.98 | 0.19	0.69 | 0.18		
CV.1se	0.03 | 0.01	0.02 | 0.00	0.02 | 0.00	0.93 | 0.25	0.26 | 0.01	
CV.min	0.42 | 0.06	0.21 | 0.02	0.10 | 0.01	0.96 | 0.32	0.57 | 0.06	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.07	0.56 | 0.10	0.97 | 0.14	0.90 | 0.17		$\rho = 0$
AIC	0.97 | 0.36	0.97 | 0.25	0.98 | 0.16	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		
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	0.61 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.03	0.15 | 0.01	0.98 | 0.10	0.93 | 0.08		$\rho = 0.5$
AIC	0.98 | 0.23	0.98 | 0.18	0.98 | 0.12	0.98 | 0.21		$\bar{s}_{Oracle}$ = 10.0
BIC	0.98 | 0.23	0.98 | 0.18	0.98 | 0.11	0.98 | 0.21		
CV.1se	0.02 | 0.00	0.02 | 0.00	0.02 | 0.00	0.62 | 0.05	0.28 | 0.01	
CV.min	0.45 | 0.03	0.33 | 0.02	0.14 | 0.01	0.94 | 0.11	0.59 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 | 0.03	0.07 | 0.00	0.97 | 0.11	0.91 | 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 131: **FDR | Sensitivity for n=100, continuous design, sparse covariates, and decay 200**.

	lasso	GL $\gamma = 1$	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 | 0.95	0.61 | 0.91	$\mathrm{sd}(\mu)/\sigma = 2$
AICc	0.63 | 0.87	0.32 | 0.84	0.79 | 0.90	0.69 | 0.89		$\rho = 0$
AIC	0.91 | 0.98	0.90 | 0.97	0.87 | 0.91	0.89 | 0.95		$\bar{s}_{Oracle}$ = 10.0
BIC	0.91 | 0.97	0.89 | 0.97	0.87 | 0.91	0.86 | 0.95		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.95 | 0.60	0.94 | 0.54	0.95 | 0.38	0.92 | 0.52		
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	$\mathrm{sd}(\mu)/\sigma = 2$
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		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.32	0.97 | 0.29	0.97 | 0.23	0.64 | 0.21		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.56 | 0.33	0.19 | 0.13	0.93 | 0.37	0.77 | 0.49		$\rho = 0$
AIC	0.94 | 0.70	0.94 | 0.56	0.95 | 0.39	0.93 | 0.67		$\bar{s}_{Oracle}$ = 10.0
BIC	0.94 | 0.70	0.94 | 0.56	0.94 | 0.38	0.92 | 0.67		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.58 | 0.10	0.10 | 0.02	0.96 | 0.19	0.88 | 0.20		$\rho = 0.5$
AIC	0.96 | 0.41	0.97 | 0.34	0.97 | 0.21	0.96 | 0.37		$\bar{s}_{Oracle}$ = 10.0
BIC	0.96 | 0.40	0.97 | 0.33	0.97 | 0.21	0.96 | 0.37		
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	$\mathrm{sd}(\mu)/\sigma = 1$
AICc	0.68 | 0.12	0.17 | 0.04	0.58 | 0.12	0.88 | 0.17		$\rho = 0.9$
AIC	0.97 | 0.28	0.98 | 0.24	0.98 | 0.20	0.96 | 0.31		$\bar{s}_{Oracle}$ = 10.0
BIC	0.97 | 0.28	0.98 | 0.24	0.97 | 0.20	0.72 | 0.18		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.55 | 0.07	0.58 | 0.11	0.97 | 0.14	0.90 | 0.17		$\rho = 0$
AIC	0.97 | 0.36	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		
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	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.56 | 0.03	0.16 | 0.01	0.98 | 0.10	0.93 | 0.08		$\rho = 0.5$
AIC	0.98 | 0.23	0.98 | 0.18	0.98 | 0.11	0.98 | 0.21		$\bar{s}_{Oracle}$ = 10.0
BIC	0.98 | 0.23	0.98 | 0.17	0.98 | 0.11	0.98 | 0.21		
CV.1se	0.03 | 0.00	0.02 | 0.00	0.01 | 0.00	0.61 | 0.05	0.28 | 0.01	
CV.min	0.45 | 0.03	0.33 | 0.02	0.15 | 0.01	0.93 | 0.10	0.60 | 0.03	$\mathrm{sd}(\mu)/\sigma = 0.5$
AICc	0.60 | 0.03	0.08 | 0.00	0.97 | 0.11	0.91 | 0.07		$\rho = 0.9$
AIC	0.98 | 0.20	0.98 | 0.17	0.98 | 0.13	0.98 | 0.20		$\bar{s}_{Oracle}$ = 10.0
BIC	0.98 | 0.20	0.98 | 0.17	0.98 | 0.12	0.83 | 0.12		