

# 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 become popular in  $\ell_1$  penalized estimation since the work by Friedman et al. (2007) and Wu and Lange (2008).

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

This yields  $\beta = (\mathbf{X}'\mathbf{V}\mathbf{X})^{-1}\mathbf{X}'\mathbf{V}\mathbf{z}$ , such that the Newton update solves a weighted-least-squares problem. Adding  $\ell_1$  costs, the minimization objective from (3) becomes

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

Our solver iterates between CD on (21) and, for non-Gaussian models, updates to  $\mathbf{v}$  and  $\mathbf{z}$ . Each  $t^{\text{th}}$  segment IRLS routine initializes  $[\hat{\alpha}, \hat{\beta}]$  at solutions for  $\lambda^{t-1}$ , 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  $\beta_j$  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.

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**Algorithm 1** Coordinate descent

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Set  $\mathbf{vh}_j = \sum_i v_i (x_{ij} - \bar{x}_j)^2$  and  $\mathbf{vx}_j = \sum_i v_i x_{ij}$  for  $j = 1 \dots p$ .
while  $\max_{j=1 \dots p} \mathbf{vh}_j \Delta_j^2 > \text{thresh}$ :
  for  $j=1 \dots p$ :
    set  $\mathbf{vg}_j = -\sum_i x_{ij} v_i (z_i - \hat{\eta}_i)$  and  $\mathbf{ghb} = \mathbf{vg}_j - \mathbf{vh}_j \hat{\beta}_j$ 
    if  $|\mathbf{ghb}| < n\lambda^t \omega_j^t$ :  $\Delta_j = -\hat{\beta}_j$ 
    else:  $\Delta_j = -(\mathbf{vg}_j - \text{sign}(\mathbf{ghb})n\lambda^t \omega_j^t) / \mathbf{vh}_j$ .
    update  $\hat{\beta}_j \pm \Delta_j$ ,  $\hat{\alpha} \pm -\mathbf{vx}_j \Delta_j$ , and  $\hat{\boldsymbol{\eta}} = \hat{\alpha} + \mathbf{X}'\hat{\boldsymbol{\beta}}$ .
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## 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  $\ell_1$ -penalized IRLS algorithms is shown in Lee et al. (2014).

## 7.2 Quasi-Newton acceleration

Under high collinearity and large  $\gamma$ , 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  $\hat{\boldsymbol{\theta}}^{(t)} \rightarrow \hat{\boldsymbol{\theta}}^{(t+1)}$ , such that the algorithm converges at  $\hat{\boldsymbol{\theta}} - M(\hat{\boldsymbol{\theta}}) = \mathbf{0}$ . With  $\mathbf{u} = \hat{\boldsymbol{\theta}}^{(-1)} - \hat{\boldsymbol{\theta}}^{(-2)}$  and  $\mathbf{v} = \hat{\boldsymbol{\theta}}^{(0)} - \hat{\boldsymbol{\theta}}^{(-1)}$ , a secant approximation to the gradient of  $M$  is  $\partial M / \partial \hat{\theta}_l \approx \mathbf{v}_l / \mathbf{u}_l$ . An approximate Newton-Raphson step to solve for the root of  $\hat{\boldsymbol{\theta}} - M(\hat{\boldsymbol{\theta}})$  updates each coordinate  $\hat{\theta}_l \leftarrow \hat{\theta}_l^{(-1)} - (\hat{\theta}_l^{(-1)} - \hat{\theta}_l^{(0)}) / (1 - \mathbf{v}_l / \mathbf{u}_l)$  which can be re-written as  $\hat{\theta}_l = (1 - \mathbf{w}_l) \hat{\theta}_l^{(-1)} + \mathbf{w}_l \hat{\theta}_l^{(0)}$  where  $\mathbf{w}_l = \mathbf{u}_l / (\mathbf{u}_l - \mathbf{v}_l)$ .

## 8 Gradient, curvature, and path starts

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

For  $\ell_1$  costs  $c_j(|\beta_j|) = |\beta_j|$ , the infimum  $\lambda$  such that  $\hat{\beta} = \mathbf{0}$  is available analytically as  $\lambda^1 = n^{-1} \max\{|g_j(\mathbf{0})|, j = 1 \dots p\}$ , the maximum mean absolute gradient for the null model with  $\hat{\beta} = \mathbf{0}$ . 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’  $\beta$ . For standard lasso estimated  $\hat{\beta}$ , many authors have shown (e.g., Buhlmann and van de Geer, 2011; Zou, 2006) that to get exact support recovery asymptotically or with high probability requires an *irrepresentability condition* which limits the size of least-squares projections from ‘true support’ onto spurious covariates.

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

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

This is often presented with  $\mathbf{v} = \mathbf{1}$ .<sup>1</sup> 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  $\mathbf{v} = \omega_S$ , which becomes less restrictive as one is able to shrink weights  $\omega_j$  for  $j \in S$ . See the remarks for more discussion.

Our comparison of interest is between  $\hat{S} = \{j : \hat{\beta}_j \neq 0\}$ , for  $\hat{\beta}$  from weighted- $\ell_1$  penalized estimation, and  $S = \{j : \beta_j^\nu \neq 0\}$  for  $\beta^\nu$  the  $\ell_0$  penalized estimator from Theorem 3.1. Whether looking to an  $\ell_0$  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  $\beta_j^\nu = 0$ .

<sup>1</sup>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*

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

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  $|\boldsymbol{\chi}'_j\mathbf{X}_S(\mathbf{X}'_S\mathbf{X}_S)^{-1}\boldsymbol{\omega}_S| \leq \frac{\|\boldsymbol{\omega}_S\|}{\sqrt{s}}\theta_{\text{adap}}(S)$  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  $n\lambda\omega_j = |\boldsymbol{\chi}'_j(\mathbf{X}\hat{\boldsymbol{\beta}} - \mathbf{y})| \leq |\boldsymbol{\chi}'_j\mathbf{X}(\hat{\boldsymbol{\beta}} - \boldsymbol{\beta}^\nu)| + |\boldsymbol{\chi}'_j\mathbf{e}^S| \leq n(2\|\boldsymbol{\omega}_S\|/\phi(L, S) + \sqrt{2\nu}/\lambda) \forall j$ . Dividing by  $n\lambda\omega_j$  and counting yields

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

Without the ability to make  $\omega_j$  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*

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

*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- $\ell_1$  minimization convergence imply that

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

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

conditions hold for projections restricted to  $S$ ,

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

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

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

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

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

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

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

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

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

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

For a Bayesian it is odd to be solving for  $\tau$  rather than marginalizing over its uncertainty. However, recognizing the form of a gamma density in (12),  $\pi(\beta_j, \tau_j)$  integrates over  $\tau_j$  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  $\beta$  under  $\text{Ga}(s-1, 1/\gamma)$  priors on each  $\tau_j$ .

## 11 Stability

A strong form of stability comes from convexity of the penalized objective in (1). This requires that the minimum eigenvalue of  $\mathbf{H}(\beta)$ , the Hessian matrix of second derivatives of  $l(\beta)$ , 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  $\lambda\gamma^2$ .<sup>2</sup> 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  $\tau_j$  is less than the number of observations. For logistic regression you need  $\text{var}(\tau_j) < n/4$ , 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,  $\hat{\mathbf{y}} = \mathbf{X}\hat{\beta}(\mathbf{y})$ , which requires that  $\|\hat{\mathbf{y}}(\mathbf{y}_1) - \hat{\mathbf{y}}(\mathbf{y}_2)\| \leq L\|\mathbf{y}_1 - \mathbf{y}_2\|$  for some finite constant  $L$  on all possible  $\mathbf{y}_1, \mathbf{y}_2$ . Zou et al. (2007) establish Lipschitz continuity for  $\ell_1$  estimated

<sup>2</sup>If  $\nu$  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  $\gamma$  for the hockey data of Section 6, even though all of these specifications are theoretically stable by some criteria.

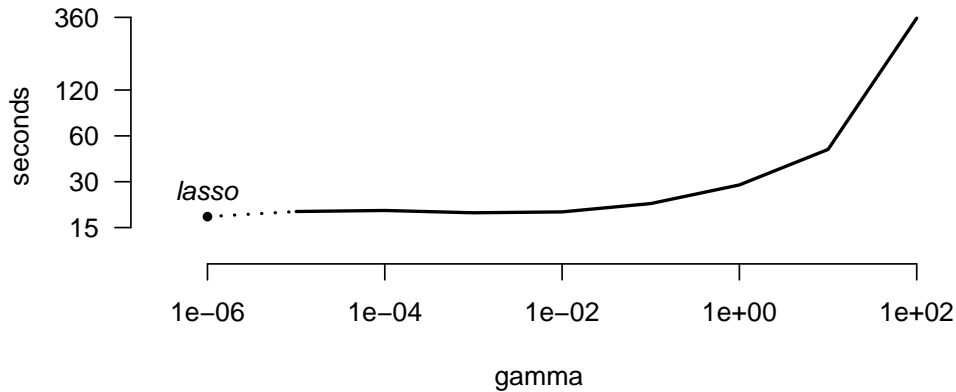


Figure 4: Timings for the hockey data path fits of Section 6 on a length-100 grid with  $\lambda^{100} = 0.01\lambda^1$ .

## 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  $\phi$ . Then we wish to minimize

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

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

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

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).<sup>3</sup> They take the form

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

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  $df = \sigma^{-2} \sum_i \text{cov}(\eta_{yi}, y_i)$ .

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  $\phi_{\mathbf{y}} = \sigma_{\mathbf{y}}^2 = \sum_i (y_i - \eta_{yi})^2 / n$ . We'll derive

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

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

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

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

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

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

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<sup>3</sup>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.



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

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

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

### 13 Full simulation results

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

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

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

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

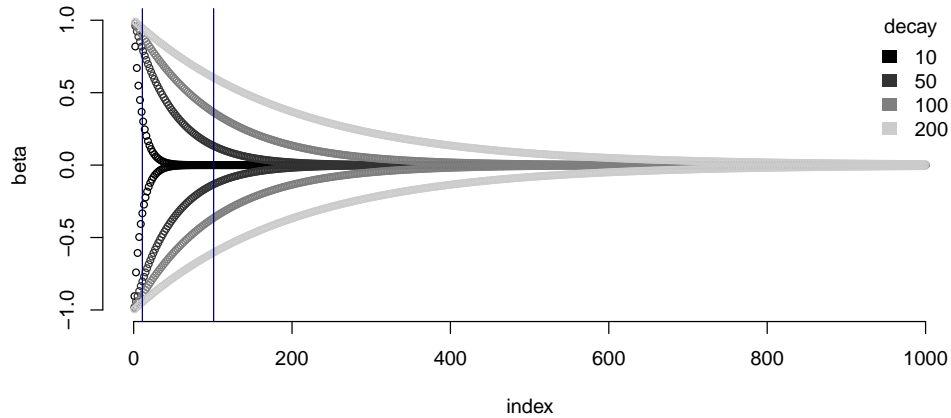


Figure 5: The linear model coefficients for our simulation in 36. Vertical lines mark thresholding points for the *sparse* model simulations, at  $J = 10$  for  $n = 100$  and at  $J = 100$  for  $n = 1000$ .

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## Detailed simulation tables

The remainder presents detailed tabulation of prediction MSE (Tables 4-35), estimation MSE (36-67), estimated model dimension (68-99), and sensitivity/FDR (100-131) across all simulation models and selection methods.

### Prediction MSE

- n=1000, sparse simulation model: tables 4-11
- n=1000, dense simulation model: tables 12-19
- n=100, sparse simulation model: tables 20-27
- n=100, dense simulation model: tables 28-35

### Estimation MSE

- n=1000, sparse simulation model: tables 36-43
- n=1000, dense simulation model: tables 44-51
- n=100, sparse simulation model: tables 52-59
- n=100, dense simulation model: tables 60-67

### Fitted Model Dimension

- n=1000, sparse simulation model: tables 68-75
- n=1000, dense simulation model: tables 76-83
- n=100, sparse simulation model: tables 84-91
- n=100, dense simulation model: tables 92-99

### Sensitivity and FDR

- n=1000, sparse simulation model: tables 100-107
- n=1000, dense simulation model: tables 108-115
- n=100, sparse simulation model: tables 116-123
- n=100, dense simulation model: tables 124-131

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			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.30
CV.min	0.32	0.32	<b>0.31</b>	0.32	<b>0.31</b>	0.31		
AICc	0.32	0.32	<b>0.31</b>	0.32			0.31	
AIC	0.42	0.42	0.45	0.32				
BIC	0.35	0.34	0.32	0.33				
CV.1se	0.31	0.30	0.29	0.30	0.29			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.26
CV.min	0.29	0.29	<b>0.28</b>	0.29	<b>0.28</b>	0.28		
AICc	0.29	0.29	<b>0.28</b>	0.29			0.28	
AIC	0.37	0.38	0.40	0.29				
BIC	0.32	0.31	0.29	0.30				
CV.1se	0.29	0.29	0.28	0.28	0.27			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.25
CV.min	0.28	0.27	<b>0.26</b>	0.27	<b>0.26</b>	0.26		
AICc	0.28	0.27	<b>0.26</b>	0.27			0.26	
AIC	0.35	0.35	0.37	0.27				
BIC	0.30	0.29	0.27	0.28				
CV.1se	1.34	1.32	1.29	1.25	1.27			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 1.17
CV.min	1.26	1.25	<b>1.23</b>	1.28	<b>1.23</b>	1.23		
AICc	1.26	1.25	1.27	1.27			1.26	
AIC	1.85	1.87	2.00	1.31				
BIC	1.35	1.31	1.28	1.27				
CV.1se	1.21	1.18	1.15	1.12	1.13			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 1.05
CV.min	1.14	1.12	<b>1.1</b>	1.15	<b>1.1</b>	1.10		
AICc	1.14	1.12	1.13	1.13			1.13	
AIC	1.65	1.67	1.78	1.18				
BIC	1.22	1.18	1.15	1.14				
CV.1se	1.14	1.12	1.09	1.06	1.07			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.99
CV.min	1.08	1.06	<b>1.04</b>	1.08	<b>1.04</b>	1.05		
AICc	1.08	1.06	1.07	1.08			1.07	
AIC	1.55	1.57	1.68	1.11				
BIC	1.16	1.12	1.09	1.09				
CV.1se	5.21	5.16	5.11	4.90	5.07			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 4.66
CV.min	4.93	<b>4.89</b>	4.90	5.20	<b>4.89</b>	4.89		
AICc	4.92	<b>4.89</b>	5.17	5.08			4.97	
AIC	7.90	8.06	8.55	6.07				
BIC	5.13	5.09	5.21	4.95				
CV.1se	4.68	4.62	4.57	4.39	4.53			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 4.16
CV.min	4.42	4.38	4.38	4.67	<b>4.37</b>	<b>4.38</b>		
AICc	4.41	4.38	4.62	4.55			4.47	
AIC	7.06	7.19	7.62	5.44				
BIC	4.62	4.57	4.64	4.46				
CV.1se	4.43	4.38	4.33	4.17	4.28			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 3.93
CV.min	4.18	4.15	4.16	4.40	<b>4.14</b>	<b>4.15</b>		
AICc	4.18	4.15	4.38	4.31			4.23	
AIC	6.66	6.78	7.20	5.08				
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.lse	2.22	2.18	2.18	2.15	2.10			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1.77
CV.min	2.07	2.03	2.05	2.07	<b>2.01</b>	2.04		
AICc	2.14	2.06	2.04	2.09			2.04	
AIC	2.52	2.56	2.73	2.07				
BIC	2.82	2.60	2.38	2.47				
CV.lse	1.99	1.96	1.95	1.95	1.88			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 1.57
CV.min	1.85	1.82	1.83	1.87	<b>1.79</b>	<b>1.82</b>		
AICc	1.93	1.85	1.82	1.89			<b>1.82</b>	
AIC	2.25	2.28	2.43	1.87				
BIC	2.63	2.38	2.13	2.27				
CV.lse	1.87	1.84	1.83	1.85	1.77			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 1.48
CV.min	1.75	1.71	1.72	1.77	<b>1.69</b>	1.72		
AICc	1.82	1.75	1.71	1.79			<b>1.71</b>	
AIC	2.11	2.14	2.28	1.77				
BIC	2.50	2.27	2.00	2.16				
CV.lse	8.48	8.43	8.71	7.83	8.19			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 6.88
CV.min	7.81	7.79	8.13	7.85	7.79	7.81		
AICc	7.91	<b>7.76</b>	8.54	7.80			8.32	
AIC	10.67	10.91	11.60	8.52				
BIC	10.46	9.64	10.63	8.90				
CV.lse	7.64	7.56	7.75	7.05	7.34			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 6.11
CV.min	7.00	6.96	7.23	7.05	6.98	6.99		
AICc	7.11	<b>6.95</b>	7.54	7.01			7.47	
AIC	9.49	9.69	10.29	7.65				
BIC	9.75	8.86	9.54	8.14				
CV.lse	7.20	7.13	7.36	6.69	6.92			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 5.75
CV.min	6.61	6.57	6.86	6.67	6.59	6.59		
AICc	6.72	<b>6.56</b>	7.11	6.64			7.05	
AIC	8.92	9.11	9.68	7.18				
BIC	9.29	8.44	9.08	7.77				
CV.lse	30.41	30.51	30.62	28.92	30.45			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 26.71
CV.min	28.91	29.51	30.38	30.23	28.94	29.01		
AICc	<b>28.81</b>	29.04	32.33	29.50			29.02	
AIC	44.19	45.58	47.69	36.58				
BIC	30.59	30.57	30.65	30.31				
CV.lse	27.07	27.11	27.19	25.86	27.08			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 23.69
CV.min	25.89	26.35	27.03	27.01	25.93	25.96		
AICc	<b>25.77</b>	25.89	29.02	26.38			25.88	
AIC	39.26	40.45	42.30	32.78				
BIC	27.17	27.16	27.20	26.98				
CV.lse	25.52	25.57	25.62	24.47	25.56			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 22.33
CV.min	24.45	24.87	25.48	25.45	24.47	24.52		
AICc	<b>24.32</b>	24.42	27.06	24.91			24.43	
AIC	36.90	38.04	39.80	30.65				
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.lse	4.93	4.93	5.13	4.95	4.74			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 3.92
CV.min	4.56	4.55	4.77	4.69	<b>4.54</b>	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.lse	4.43	4.41	4.59	4.50	4.26			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 3.47
CV.min	4.09	<b>4.06</b>	4.25	4.25	<b>4.06</b>	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.lse	4.17	4.16	4.31	4.30	4.00			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 3.27
CV.min	3.86	<b>3.83</b>	3.99	4.04	<b>3.83</b>	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.lse	18.86	19.46	22.40	17.23	18.29			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 14.88
CV.min	<b>16.91</b>	17.35	20.03	17.04	<b>16.91</b>	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.lse	17.09	17.59	20.25	15.52	16.55			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 13.17
CV.min	<b>15.17</b>	15.53	18.18	15.31	<b>15.17</b>	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.lse	16.11	16.52	19.24	14.72	15.62			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 12.42
CV.min	<b>14.32</b>	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.lse	61.85	61.95	61.96	59.96	61.90			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 56.30
CV.min	60.09	61.49	61.94	62.57	60.06	60.24		
AICc	<b>59.74</b>	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.lse	54.84	54.89	54.90	53.43	54.87			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 49.87
CV.min	53.63	54.59	54.90	55.72	53.68	53.77		
AICc	<b>53.28</b>	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.lse	51.68	51.71	51.72	50.51	51.71			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 46.94
CV.min	50.61	51.47	51.72	52.52	50.62	50.75		
AICc	<b>50.25</b>	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.lse	11.14	11.67	14.02	11.52	10.67			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 8.99</i>
CV.min	10.01	10.28	11.57	10.65	<b>9.96</b>	10.02		
AICc	12.40	11.26	10.74	11.43			10.74	
AIC	10.87	11.12	11.75	10.29				
BIC	31.02	30.70	22.48	28.59				
CV.lse	10.11	10.55	13.01	10.54	9.67			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 7.97</i>
CV.min	8.99	9.22	10.54	9.69	<b>8.93</b>	9.00		
AICc	11.39	10.18	9.56	10.45			9.56	
AIC	9.65	9.86	10.40	9.29				
BIC	27.48	27.38	21.35	26.13				
CV.lse	9.46	9.91	12.60	10.08	9.07			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 7.51</i>
CV.min	8.46	8.67	9.98	9.21	<b>8.41</b>	8.47		
AICc	10.75	9.61	9.01	9.99			9.01	
AIC	9.07	9.27	9.78	8.78				
BIC	25.87	25.76	20.43	24.77				
CV.lse	42.32	46.60	49.69	37.25	41.22			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 32.78</i>
CV.min	36.36	40.66	48.78	36.41	<b>36.32</b>	36.42		
AICc	38.68	36.96	40.79	36.80			37.23	
AIC	44.46	45.96	48.21	38.73				
BIC	49.76	49.76	49.81	49.26				
CV.lse	38.81	42.45	44.07	33.54	38.03			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 29.03</i>
CV.min	32.89	37.27	43.45	<b>32.7</b>	32.83	32.93		
AICc	35.14	33.13	36.23	33.10			33.62	
AIC	39.44	40.71	42.68	34.60				
BIC	44.09	44.08	44.12	43.75				
CV.lse	36.66	39.88	41.48	31.83	36.00			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 27.37</i>
CV.min	31.09	34.94	40.95	<b>30.91</b>	31.05	31.14		
AICc	33.09	31.24	34.04	31.35			31.75	
AIC	37.06	38.26	40.14	32.51				
BIC	41.50	41.50	41.53	41.22				
CV.lse	124.61	124.67	124.67	122.31	124.65			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 118.96</i>
CV.min	122.59	124.58	124.76	127.56	122.60	122.83		
AICc	<b>121.94</b>	127.84	127.54	124.38			126.15	
AIC	181.11	189.10	195.52	155.43				
BIC	124.65	124.67	126.69	124.53				
CV.lse	110.36	110.39	110.40	108.74	110.39			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 105.41</i>
CV.min	109.04	110.34	110.47	113.45	109.10	109.19		
AICc	<b>108.53</b>	112.85	113.18	110.60			111.39	
AIC	160.43	167.29	173.04	138.30				
BIC	110.38	110.39	110.77	110.31				
CV.lse	103.91	103.92	103.92	102.63	103.92			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 99.15</i>
CV.min	102.75	103.86	103.98	106.77	102.85	102.94		
AICc	<b>102.27</b>	106.26	106.53	104.36			104.97	
AIC	150.74	157.29	162.82	129.44				
BIC	103.90	103.92	104.37	103.84				

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			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1.18
CV.min	1.30	1.28	1.25	1.27	<b>1.24</b>	<b>1.25</b>		
AICc	1.30	1.28	1.27	1.27			1.27	
AIC	1.68	1.69	1.78	1.27				
BIC	1.42	1.37	1.32	1.32				
CV.1se	0.56	0.55	0.51	0.61	0.49			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.45
CV.min	0.53	0.51	0.49	0.59	<b>0.47</b>	<b>0.49</b>		
AICc	0.53	0.52	0.49	0.59			<b>0.49</b>	
AIC	0.61	0.61	0.63	0.59				
BIC	0.64	0.60	0.54	0.61				
CV.1se	0.16	0.15	0.14	0.17	0.14			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.12
CV.min	0.15	0.15	0.14	0.17	<b>0.13</b>	<b>0.14</b>		
AICc	0.15	0.15	0.14	0.17			<b>0.14</b>	
AIC	0.15	0.14	0.14	0.17				
BIC	0.20	0.19	0.17	0.17				
CV.1se	5.39	5.29	5.15	5.00	5.10			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 4.70
CV.min	5.08	5.01	4.95	5.13	<b>4.94</b>	<b>4.95</b>		
AICc	5.08	5.02	5.06	5.08			5.05	
AIC	7.41	7.50	8.01	5.27				
BIC	5.41	5.32	5.32	5.09				
CV.1se	2.19	2.12	2.01	2.08	1.94			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 1.77
CV.min	2.04	1.99	1.92	2.07	<b>1.88</b>	<b>1.92</b>		
AICc	2.04	1.99	1.94	2.06			1.94	
AIC	2.69	2.72	2.89	2.07				
BIC	2.34	2.25	2.12	2.23				
CV.1se	0.64	0.61	0.56	0.54	0.54			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.48
CV.min	0.58	0.57	0.54	<b>0.52</b>	0.53	0.54		
AICc	0.58	0.57	0.55	<b>0.52</b>			0.57	
AIC	0.61	0.61	0.65	<b>0.52</b>				
BIC	0.69	0.68	0.68	0.54				
CV.1se	20.93	20.70	20.51	19.70	20.35			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 18.68
CV.min	19.78	19.65	19.69	20.92	<b>19.64</b>	19.66		
AICc	19.76	19.76	20.60	20.41			19.76	
AIC	31.66	32.29	34.25	24.31				
BIC	20.61	20.65	21.70	19.92				
CV.1se	8.31	8.18	8.01	7.93	7.74			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 7.04
CV.min	7.81	7.71	7.65	8.19	<b>7.48</b>	7.65		
AICc	7.78	7.73	7.97	8.10			7.78	
AIC	11.66	11.85	12.62	8.89				
BIC	8.21	8.20	8.22	8.11				
CV.1se	2.18	2.17	2.12	2.05	2.15			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 1.91
CV.min	2.09	2.09	2.08	<b>2.02</b>	2.07	2.08		
AICc	2.09	2.09	2.08	2.03			2.08	
AIC	2.66	2.74	3.05	2.03				
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.lse	8.89	8.75	8.73	8.62	8.46			
CV.min	8.29	8.15	8.22	8.31	<b>8.07</b>	8.19		$\text{sd}(\mu)/\sigma = 2$
AICc	8.58	8.33	8.21	8.36			8.23	$\rho = 0$
AIC	10.11	10.26	10.96	8.32				<i>Oracle</i> : 7.12
BIC	11.38	10.69	10.16	9.86				
CV.lse	3.36	3.26	3.14	3.80	3.02			
CV.min	3.10	3.02	2.95	3.53	<b>2.89</b>	2.95		$\text{sd}(\mu)/\sigma = 2$
AICc	3.36	3.18	2.92	3.60			2.91	$\rho = 0.5$
AIC	3.44	3.46	3.65	3.49				<i>Oracle</i> : 2.44
BIC	7.68	5.31	3.78	5.59				
CV.lse	0.63	0.61	0.58	1.17	0.56			
CV.min	0.59	0.57	<b>0.55</b>	1.10	<b>0.55</b>	0.55		$\text{sd}(\mu)/\sigma = 2$
AICc	0.65	0.61	<b>0.55</b>	1.10			0.55	$\rho = 0.9$
AIC	0.59	0.57	0.56	1.10				<i>Oracle</i> : 0.44
BIC	1.67	1.66	1.65	1.25				
CV.lse	34.06	33.85	34.98	31.42	32.94			
CV.min	31.34	<b>31.26</b>	32.68	31.51	31.30	31.33		$\text{sd}(\mu)/\sigma = 1$
AICc	31.83	31.40	33.52	31.27			31.50	$\rho = 0$
AIC	42.77	43.75	46.49	34.15				<i>Oracle</i> : 27.62
BIC	42.03	40.64	48.29	35.76				
CV.lse	13.53	12.89	13.06	12.68	11.78			
CV.min	11.81	11.55	11.96	12.24	<b>11.26</b>	11.61		$\text{sd}(\mu)/\sigma = 1$
AICc	12.25	11.78	11.53	12.34			11.74	$\rho = 0.5$
AIC	14.53	14.78	15.67	12.45				<i>Oracle</i> : 9.45
BIC	16.62	16.65	16.79	16.24				
CV.lse	2.91	2.78	2.71	2.50	2.29			
CV.min	2.64	2.45	2.48	2.35	<b>2.15</b>	2.39		$\text{sd}(\mu)/\sigma = 1$
AICc	2.67	2.67	2.62	2.35			2.56	$\rho = 0.9$
AIC	2.29	2.32	2.52	2.34				<i>Oracle</i> : 1.72
BIC	2.84	2.84	2.82	2.79				
CV.lse	122.32	122.70	123.15	116.28	122.44			
CV.min	116.26	118.42	122.17	121.45	116.33	116.64		$\text{sd}(\mu)/\sigma = 0.5$
AICc	<b>115.83</b>	118.96	123.27	118.51			115.82	$\rho = 0$
AIC	177.17	182.78	191.21	146.86				<i>Oracle</i> : 107.15
BIC	123.05	123.19	123.26	121.93				
CV.lse	42.16	42.17	42.17	41.75	42.16			
CV.min	41.82	41.91	42.11	43.03	41.82	41.85		$\text{sd}(\mu)/\sigma = 0.5$
AICc	<b>41.56</b>	42.03	42.18	42.51			41.59	$\rho = 0.5$
AIC	60.25	61.81	64.90	50.74				<i>Oracle</i> : 36.65
BIC	42.13	42.15	42.17	42.06				
CV.lse	7.70	7.69	7.67	7.60	7.70			
CV.min	7.50	7.49	7.47	7.50	<b>7.46</b>	7.47		$\text{sd}(\mu)/\sigma = 0.5$
AICc	7.49	7.51	7.49	7.52			7.48	$\rho = 0.9$
AIC	9.77	10.11	11.15	7.60				<i>Oracle</i> : 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.lse	19.75	19.76	20.62	19.85	19.04			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 15.73
CV.min	18.30	18.24	19.12	18.83	<b>18.2</b>	18.27		
AICc	19.91	19.17	18.81	19.30			18.89	
AIC	21.09	21.49	22.88	18.63				
BIC	46.55	33.24	24.57	27.18				
CV.lse	7.50	7.32	7.19	9.12	7.09			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 5.31
CV.min	6.74	<b>6.63</b>	6.69	8.03	6.70	6.65		
AICc	8.11	7.40	6.65	8.66			6.65	
AIC	7.16	7.24	7.62	7.58				
BIC	20.78	20.81	17.61	20.27				
CV.lse	1.32	1.28	1.23	2.70	1.26			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.90
CV.min	1.18	1.16	1.15	2.39	1.19	<b>1.15</b>		
AICc	1.51	1.32	1.16	2.40			1.16	
AIC	1.18	<b>1.14</b>	1.15	2.36				
BIC	3.33	3.33	3.31	3.28				
CV.lse	75.68	78.22	89.56	69.05	73.29			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 59.71
CV.min	<b>67.78</b>	69.59	80.16	68.33	67.80	67.97		
AICc	70.19	69.24	77.65	68.32			69.41	
AIC	87.75	90.22	95.25	73.65				
BIC	98.91	98.92	99.42	91.76				
CV.lse	32.61	32.35	33.50	27.99	31.66			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 20.16
CV.min	27.83	28.32	32.85	26.47	27.79	27.43		
AICc	28.71	27.60	27.00	27.01			27.97	
AIC	29.61	30.23	31.88	<b>26.46</b>				
BIC	33.51	33.54	33.58	33.30				
CV.lse	5.69	5.68	5.64	5.37	5.66			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 3.43
CV.min	5.46	5.44	5.46	4.96	5.37	5.43		
AICc	5.41	5.49	5.47	4.92			5.42	
AIC	<b>4.51</b>	4.59	5.00	4.75				
BIC	5.51	5.51	5.48	5.47				
CV.lse	248.48	248.75	248.83	240.83	248.64			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 225.74
CV.min	241.25	246.89	248.80	251.00	241.20	241.96		
AICc	<b>239.87</b>	247.57	248.98	244.78			239.94	
AIC	359.81	373.33	388.16	305.32				
BIC	248.75	248.83	260.38	248.16				
CV.lse	84.04	84.04	84.04	83.70	84.04			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 76.23
CV.min	83.75	83.95	84.07	86.35	83.78	83.79		
AICc	<b>83.45</b>	84.01	84.08	85.29			83.43	
AIC	120.66	124.51	130.20	103.48				
BIC	84.03	84.04	84.04	83.99				
CV.lse	14.33	14.33	14.33	14.29	14.34			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 12.97
CV.min	14.17	14.16	14.17	14.21	14.15	<b>14.15</b>		
AICc	<b>14.13</b>	14.20	14.25	14.25			14.14	
AIC	18.82	19.62	21.33	14.53				
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.lse	44.42	46.71	56.79	46.06	42.76			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 36.05
CV.min	40.06	41.17	46.59	42.63	<b>39.87</b>	40.10		
AICc	49.74	45.58	43.24	45.76			44.27	
AIC	43.49	44.52	47.03	41.20				
BIC	124.28	124.46	72.81	114.38				
CV.lse	20.11	21.43	39.27	23.34	19.23			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 12.09
CV.min	15.20	15.65	34.29	19.50	15.17	15.14		
AICc	26.86	19.33	15.30	22.13			15.30	
AIC	<b>14.76</b>	14.97	15.68	16.30				
BIC	41.76	41.80	41.06	41.46				
CV.lse	5.61	5.64	6.78	6.32	6.14			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 1.98
CV.min	4.01	4.16	6.49	5.32	4.91	3.73		
AICc	6.40	6.11	2.57	5.28			2.57	
AIC	2.40	<b>2.37</b>	2.43	4.53				
BIC	6.66	6.66	6.64	6.60				
CV.lse	169.30	187.88	199.29	149.02	165.35			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 131.43
CV.min	<b>145.46</b>	163.65	195.22	145.76	145.47	145.65		
AICc	155.35	149.68	176.34	147.26			151.51	
AIC	178.00	184.00	193.01	154.99				
BIC	199.52	199.72	199.19	197.28				
CV.lse	66.93	67.00	67.02	59.80	66.97			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 44.09
CV.min	64.04	65.70	66.87	55.90	63.97	64.09		
AICc	63.18	65.26	63.30	57.33			63.14	
AIC	59.68	61.25	64.28	<b>54.73</b>				
BIC	66.99	67.02	67.02	66.86				
CV.lse	11.00	11.00	10.99	10.89	11.01			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 7.22
CV.min	10.74	10.74	10.76	10.35	10.73	10.72		
AICc	10.65	10.82	10.84	10.27			10.65	
AIC	<b>9.05</b>	9.31	10.04	9.44				
BIC	10.86	10.87	10.92	10.78				
CV.lse	499.75	499.92	499.94	490.79	499.87			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 476.83
CV.min	491.34	499.45	500.31	511.49	491.87	492.40		
AICc	<b>488.97</b>	501.61	499.93	498.68			488.93	
AIC	725.13	757.08	782.66	623.41				
BIC	499.85	499.93	702.82	499.40				
CV.lse	167.73	167.73	167.73	167.37	167.73			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 159.94
CV.min	167.35	167.70	167.82	172.56	167.40	167.48		
AICc	<b>166.89</b>	167.74	167.73	170.57			166.89	
AIC	241.13	250.55	260.98	208.44				
BIC	167.72	167.73	169.58	167.68				
CV.lse	27.55	27.55	27.55	27.53	27.55			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 26.20
CV.min	27.44	27.45	27.50	27.54	27.44	<b>27.44</b>		
AICc	<b>27.39</b>	27.50	27.54	27.60			27.39	
AIC	36.95	38.80	41.67	28.31				
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			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.31
CV.min	0.32	0.32	<b>0.31</b>	0.32	<b>0.31</b>	0.31		
AICc	0.32	0.32	<b>0.31</b>	0.32			0.31	
AIC	0.42	0.42	0.45	0.32				
BIC	0.35	0.34	0.32	0.33				
CV.1se	0.31	0.30	0.29	0.30	0.29			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.28
CV.min	0.29	0.29	<b>0.28</b>	0.29	<b>0.28</b>	0.28		
AICc	0.29	0.29	<b>0.28</b>	0.29			0.28	
AIC	0.37	0.38	0.40	0.29				
BIC	0.32	0.31	0.29	0.30				
CV.1se	0.29	0.29	0.28	0.28	0.27			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.26
CV.min	0.28	0.27	<b>0.26</b>	0.27	<b>0.26</b>	0.26		
AICc	0.28	0.27	<b>0.26</b>	0.27			0.26	
AIC	0.35	0.35	0.37	0.27				
BIC	0.30	0.29	0.27	0.28				
CV.1se	1.34	1.32	1.29	1.25	1.27			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 1.24
CV.min	1.26	1.25	<b>1.23</b>	1.28	<b>1.23</b>	1.23		
AICc	1.26	1.25	1.27	1.27			1.27	
AIC	1.85	1.87	2.00	1.31				
BIC	1.35	1.31	1.29	1.27				
CV.1se	1.21	1.18	1.15	1.12	1.13			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 1.11
CV.min	1.14	1.12	<b>1.1</b>	1.15	<b>1.1</b>	1.10		
AICc	1.14	1.12	1.13	1.14			1.13	
AIC	1.65	1.67	1.78	1.18				
BIC	1.22	1.18	1.15	1.14				
CV.1se	1.14	1.12	1.09	1.06	1.07			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 1.05
CV.min	1.08	1.06	<b>1.04</b>	1.08	<b>1.04</b>	1.05		
AICc	1.08	1.06	1.07	1.08			1.07	
AIC	1.55	1.57	1.68	1.11				
BIC	1.16	1.12	1.09	1.09				
CV.1se	5.21	5.16	5.11	4.90	5.07			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 4.98
CV.min	4.93	<b>4.89</b>	4.90	5.20	<b>4.89</b>	4.90		
AICc	4.92	<b>4.89</b>	5.17	5.08			4.97	
AIC	7.90	8.06	8.55	6.07				
BIC	5.14	5.09	5.21	4.96				
CV.1se	4.68	4.62	4.56	4.39	4.53			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 4.44
CV.min	4.42	4.38	4.38	4.67	<b>4.37</b>	4.37		
AICc	4.41	4.38	4.62	4.55			4.46	
AIC	7.06	7.19	7.62	5.44				
BIC	4.62	4.57	4.64	4.46				
CV.1se	4.43	4.38	4.33	4.17	4.28			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 4.20
CV.min	4.18	4.15	4.16	4.40	<b>4.13</b>	<b>4.15</b>		
AICc	4.18	4.15	4.38	4.31			4.23	
AIC	6.65	6.78	7.20	5.08				
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.lse	2.11	2.06	2.02	2.04	1.97			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1.66
CV.min	1.98	1.93	1.91	1.97	<b>1.89</b>	<b>1.91</b>		
AICc	2.03	1.95	1.93	1.98			1.93	
AIC	2.47	2.50	2.68	1.98				
BIC	2.59	2.38	2.18	2.29				
CV.lse	1.90	1.85	1.81	1.85	1.76			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 1.47
CV.min	1.78	1.73	1.71	1.78	<b>1.69</b>	<b>1.71</b>		
AICc	1.83	1.76	1.71	1.79			1.72	
AIC	2.20	2.23	2.38	1.79				
BIC	2.40	2.19	1.95	2.12				
CV.lse	1.79	1.74	1.70	1.76	1.65			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 1.38
CV.min	1.68	1.64	1.61	1.69	<b>1.59</b>	1.62		
AICc	1.73	1.66	1.62	1.70			1.62	
AIC	2.07	2.09	2.23	1.69				
BIC	2.28	2.08	1.84	2.02				
CV.lse	8.24	8.17	8.39	7.62	7.95			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 6.62
CV.min	7.60	7.57	7.86	7.64	7.58	7.60		
AICc	7.69	<b>7.54</b>	8.30	7.58			8.08	
AIC	10.46	10.70	11.38	8.30				
BIC	10.06	9.29	10.18	8.59				
CV.lse	7.42	7.33	7.47	6.86	7.11			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 5.88
CV.min	6.82	6.77	6.99	6.87	6.78	6.79		
AICc	6.92	<b>6.76</b>	7.35	6.82			7.26	
AIC	9.31	9.51	10.10	7.46				
BIC	9.38	8.53	9.14	7.86				
CV.lse	6.99	6.92	7.11	6.51	6.71			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 5.54
CV.min	6.44	6.39	6.65	6.49	6.40	6.41		
AICc	6.54	<b>6.38</b>	6.88	6.46			6.83	
AIC	8.75	8.94	9.50	7.00				
BIC	8.98	8.13	8.69	7.50				
CV.lse	29.81	29.91	30.03	28.31	29.84			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 26.48
CV.min	28.31	28.88	29.78	29.60	28.34	28.39		
AICc	<b>28.2</b>	28.41	31.56	28.90			28.40	
AIC	43.35	44.71	46.79	35.84				
BIC	30.01	29.97	30.07	29.69				
CV.lse	26.57	26.62	26.70	25.36	26.60			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 23.53
CV.min	25.38	25.82	26.53	26.50	25.42	25.44		
AICc	<b>25.25</b>	25.38	28.50	25.87			25.38	
AIC	38.55	39.72	41.54	32.20				
BIC	26.68	26.67	26.72	26.49				
CV.lse	25.05	25.11	25.16	23.99	25.10			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 22.16
CV.min	23.95	24.36	25.01	24.95	23.99	24.03		
AICc	<b>23.85</b>	23.94	26.63	24.43			<b>23.94</b>	
AIC	36.24	37.35	39.09	30.06				
BIC	25.15	25.13	25.18	24.98				

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.lse	3.76	3.61	3.36	3.65	3.30			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 2.94
CV.min	3.56	3.43	<b>3.26</b>	3.53	<b>3.26</b>	3.28		
AICc	3.67	3.47	3.35	3.55			3.36	
AIC	4.47	4.55	4.87	3.57				
BIC	4.59	4.06	3.62	4.07				
CV.lse	3.38	3.23	2.98	3.31	2.91			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 2.61
CV.min	3.20	3.08	2.90	3.20	<b>2.88</b>	2.90		
AICc	3.30	3.11	2.98	3.23			2.98	
AIC	3.98	4.05	4.32	3.23				
BIC	4.23	3.69	3.20	3.78				
CV.lse	3.18	3.04	2.83	3.16	2.76			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 2.46
CV.min	3.02	2.91	2.75	3.04	<b>2.72</b>	2.76		
AICc	3.12	2.94	2.81	3.07			2.81	
AIC	3.74	3.81	4.07	3.06				
BIC	4.04	3.51	3.04	3.63				
CV.lse	15.29	15.35	16.83	14.13	14.78			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 11.78
CV.min	13.96	14.04	15.26	14.06	<b>13.95</b>	13.98		
AICc	14.24	13.96	15.45	14.00			14.51	
AIC	18.83	19.34	20.48	15.33				
BIC	21.17	19.98	21.18	17.90				
CV.lse	13.82	13.84	15.21	12.77	13.33			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 10.46
CV.min	12.54	12.58	13.66	12.68	12.53	12.54		
AICc	12.85	<b>12.52</b>	13.71	12.65			13.25	
AIC	16.74	17.18	18.16	13.77				
BIC	18.86	18.33	18.89	16.72				
CV.lse	13.02	13.04	14.46	12.13	12.59			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 9.86
CV.min	11.84	11.86	13.02	12.00	11.83	<b>11.83</b>		
AICc	12.15	<b>11.82</b>	12.94	11.98			12.53	
AIC	15.75	16.16	17.10	12.95				
BIC	17.80	17.37	17.79	16.04				
CV.lse	53.36	53.48	53.51	51.35	53.41			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 47.14
CV.min	51.39	52.79	53.45	53.56	51.43	51.55		
AICc	<b>51.14</b>	52.09	55.86	52.29			51.95	
AIC	77.50	80.32	83.64	65.12				
BIC	53.49	53.50	53.52	53.31				
CV.lse	47.42	47.49	47.51	45.88	47.46			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 41.82
CV.min	46.02	46.99	47.48	47.86	46.06	46.14		
AICc	<b>45.75</b>	46.41	50.02	46.73			46.29	
AIC	68.81	71.22	74.17	58.32				
BIC	47.49	47.49	47.51	47.37				
CV.lse	44.74	44.79	44.80	43.44	44.78			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 39.43
CV.min	43.47	44.38	44.80	45.16	43.50	43.59		
AICc	<b>43.18</b>	43.79	46.92	44.14			43.66	
AIC	64.73	67.04	69.87	54.55				
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.lse	5.50	5.19	4.63	5.29	4.56			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 4.33
CV.min	5.24	4.99	4.60	5.13	<b>4.55</b>	4.60		
AICc	5.39	5.03	4.76	5.16			4.75	
AIC	6.62	6.76	7.25	5.24				
BIC	6.47	5.65	4.98	5.74				
CV.lse	4.93	4.64	4.09	4.81	4.01			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 3.84
CV.min	4.70	4.46	4.08	4.66	<b>4</b>	4.08		
AICc	4.85	4.51	4.20	4.69			4.20	
AIC	5.89	6.00	6.43	4.73				
BIC	5.94	5.10	4.38	5.31				
CV.lse	4.65	4.38	3.88	4.59	3.81			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 3.62
CV.min	4.44	4.22	3.88	4.43	<b>3.78</b>	3.88		
AICc	4.59	4.26	3.97	4.46			3.98	
AIC	5.54	5.65	6.05	4.49				
BIC	5.65	4.82	4.15	5.08				
CV.lse	22.82	23.17	26.71	21.08	22.03			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 17.32
CV.min	<b>20.74</b>	21.00	23.69	20.92	<b>20.74</b>	20.79		
AICc	21.25	20.81	23.26	20.86			21.08	
AIC	27.81	28.66	30.26	22.86				
BIC	31.33	30.68	31.31	28.86				
CV.lse	20.66	20.93	24.44	19.07	19.93			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 15.36
CV.min	<b>18.64</b>	18.82	21.57	18.87	<b>18.64</b>	18.66		
AICc	19.17	18.65	20.58	18.86			19.17	
AIC	24.70	25.42	26.82	20.50				
BIC	27.83	27.60	27.86	26.46				
CV.lse	19.48	19.76	23.30	18.14	18.83			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 14.49
CV.min	17.62	17.78	20.53	17.88	<b>17.61</b>	<b>17.62</b>		
AICc	18.13	17.63	19.45	17.89			18.14	
AIC	23.26	23.95	25.28	19.30				
BIC	26.26	26.12	26.29	25.22				
CV.lse	78.47	78.59	78.62	75.90	78.53			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 69.25
CV.min	76.00	78.08	78.62	79.15	76.01	76.19		
AICc	<b>75.6</b>	77.89	81.00	77.21			77.52	
AIC	114.01	118.59	123.13	96.44				
BIC	78.59	78.61	78.62	78.42				
CV.lse	69.71	69.78	69.79	67.79	69.75			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 61.43
CV.min	68.02	69.44	69.81	70.68	68.07	68.17		
AICc	<b>67.61</b>	69.22	72.36	68.97			68.86	
AIC	101.21	105.15	109.20	86.21				
BIC	69.77	69.78	69.79	69.65				
CV.lse	65.81	65.86	65.86	64.21	65.85			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 57.96
CV.min	64.32	65.58	65.89	66.75	64.36	64.49		
AICc	<b>63.9</b>	65.37	68.08	65.23			65.06	
AIC	95.28	99.04	102.94	80.65				
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.lse	1.38	1.35	1.31	1.32	1.28			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1.25
CV.min	1.30	1.28	1.25	1.27	<b>1.24</b>	<b>1.25</b>		
AICc	1.30	1.28	1.27	1.27			1.27	
AIC	1.68	1.69	1.79	1.27				
BIC	1.42	1.37	1.32	1.32				
CV.lse	0.56	0.55	0.51	0.61	0.49			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.47
CV.min	0.53	0.51	0.49	0.59	<b>0.47</b>	<b>0.49</b>		
AICc	0.53	0.52	0.49	0.59			<b>0.49</b>	
AIC	0.61	0.61	0.63	0.59				
BIC	0.64	0.60	0.54	0.61				
CV.lse	0.16	0.15	0.14	0.17	0.14			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.13
CV.min	0.15	0.15	0.14	0.17	<b>0.13</b>	<b>0.14</b>		
AICc	0.15	0.15	0.14	0.17			<b>0.14</b>	
AIC	0.15	0.14	0.14	0.17				
BIC	0.20	0.19	0.17	0.17				
CV.lse	5.39	5.29	5.15	5.00	5.10			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 4.99
CV.min	5.08	5.01	4.95	5.13	<b>4.94</b>	<b>4.95</b>		
AICc	5.08	5.02	5.06	5.08			5.05	
AIC	7.41	7.50	8.01	5.27				
BIC	5.42	5.32	5.32	5.09				
CV.lse	2.19	2.12	2.01	2.08	1.94			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 1.88
CV.min	2.04	1.99	1.92	2.07	<b>1.88</b>	<b>1.92</b>		
AICc	2.04	1.99	1.94	2.06			1.94	
AIC	2.69	2.72	2.89	2.07				
BIC	2.34	2.25	2.12	2.23				
CV.lse	0.64	0.61	0.56	0.54	0.54			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.51
CV.min	0.58	0.57	0.54	<b>0.52</b>	0.53	0.54		
AICc	0.58	0.57	0.55	<b>0.52</b>			0.57	
AIC	0.61	0.61	0.65	<b>0.52</b>				
BIC	0.69	0.68	0.68	0.54				
CV.lse	20.93	20.70	20.50	19.70	20.35			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 19.97
CV.min	19.78	19.65	19.69	20.92	<b>19.64</b>	19.66		
AICc	19.76	19.76	20.60	20.41			19.76	
AIC	31.66	32.29	34.25	24.31				
BIC	20.61	20.65	21.70	19.91				
CV.lse	8.31	8.18	8.01	7.93	7.74			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 7.53
CV.min	7.82	7.71	7.66	8.19	<b>7.48</b>	7.65		
AICc	7.78	7.74	7.98	8.10			7.78	
AIC	11.66	11.85	12.62	8.89				
BIC	8.22	8.21	8.22	8.12				
CV.lse	2.18	2.17	2.12	2.05	2.15			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 2.04
CV.min	2.09	2.09	2.08	<b>2.02</b>	2.07	2.08		
AICc	2.09	2.09	2.08	2.03			2.08	
AIC	2.66	2.74	3.05	2.03				
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.lse	8.47	8.27	8.11	8.19	7.90			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 6.65</i>
CV.min	7.94	7.76	7.67	7.92	<b>7.61</b>	7.69		
AICc	8.15	7.88	7.74	7.95			7.76	
AIC	9.89	10.03	10.73	7.94				
BIC	10.42	9.81	9.31	9.16				
CV.lse	3.20	3.09	2.93	3.63	2.81			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 2.28</i>
CV.min	2.98	2.89	2.78	3.38	<b>2.71</b>	2.78		
AICc	3.18	3.01	2.76	3.44			<b>2.76</b>	
AIC	3.35	3.38	3.57	3.36				
BIC	6.83	4.77	3.50	5.19				
CV.lse	0.61	0.59	0.55	1.14	0.53			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.42</i>
CV.min	0.57	0.55	0.53	1.08	<b>0.52</b>	<b>0.53</b>		
AICc	0.62	0.58	0.53	1.08			<b>0.53</b>	
AIC	0.57	0.55	0.54	1.08				
BIC	1.64	1.64	1.59	1.21				
CV.lse	33.07	32.79	33.77	30.55	31.94			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 26.59</i>
CV.min	30.50	<b>30.37</b>	31.59	30.66	30.41	30.47		
AICc	30.93	30.49	32.44	30.41			30.59	
AIC	41.93	42.89	45.60	33.25				
BIC	40.50	39.02	47.09	34.53				
CV.lse	13.10	12.48	12.58	12.37	11.41			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 9.11</i>
CV.min	11.51	11.24	11.59	11.95	<b>10.93</b>	11.30		
AICc	11.92	11.46	11.22	12.03			11.40	
AIC	14.26	14.50	15.38	12.16				
BIC	16.31	16.34	16.49	15.92				
CV.lse	2.86	2.70	2.63	2.46	2.21			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 1.68</i>
CV.min	2.56	2.37	2.38	2.31	<b>2.09</b>	2.31		
AICc	2.60	2.59	2.53	2.31			2.48	
AIC	2.26	2.28	2.48	2.30				
BIC	2.80	2.80	2.78	2.75				
CV.lse	119.93	120.31	120.82	113.86	120.03			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 106.35</i>
CV.min	113.81	115.93	119.70	118.93	113.89	114.14		
AICc	<b>113.42</b>	116.46	120.93	116.06			113.39	
AIC	173.78	179.27	187.58	144.00				
BIC	120.69	120.84	120.92	119.52				
CV.lse	41.42	41.42	41.42	40.99	41.42			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 36.43</i>
CV.min	41.07	41.14	41.36	42.25	41.06	41.08		
AICc	<b>40.82</b>	41.28	41.44	41.71			40.82	
AIC	59.16	60.69	63.73	49.77				
BIC	41.38	41.40	41.42	41.31				
CV.lse	7.60	7.59	7.57	7.50	7.60			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 6.70</i>
CV.min	7.40	7.39	7.37	7.40	<b>7.36</b>	7.37		
AICc	7.39	7.41	7.39	7.42			7.38	
AIC	9.64	9.97	11.00	7.50				
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.lse	15.10	14.47	13.52	14.64	13.24			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 11.82
CV.min	14.30	13.80	<b>13.11</b>	14.18	13.12	13.17		
AICc	14.72	14.01	13.45	14.25			13.53	
AIC	17.93	18.24	19.55	14.33				
BIC	18.30	16.69	14.97	16.28				
CV.lse	5.57	5.26	4.71	6.67	4.41			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 4.01
CV.min	5.32	5.06	4.65	6.10	<b>4.39</b>	4.65		
AICc	5.67	5.23	4.64	6.35			4.64	
AIC	6.07	6.12	6.49	5.98				
BIC	17.96	17.51	5.13	16.69				
CV.lse	1.01	0.96	0.86	2.24	0.82			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.70
CV.min	0.97	0.92	0.85	2.01	<b>0.81</b>	0.85		
AICc	1.06	0.97	0.85	2.02			0.85	
AIC	0.96	0.93	0.94	2.01				
BIC	2.91	2.92	2.88	2.82				
CV.lse	61.30	61.63	67.80	56.69	59.40			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 47.30
CV.min	<b>56.03</b>	56.36	61.20	56.45	56.05	56.08		
AICc	57.25	56.51	61.22	56.21			56.57	
AIC	75.47	77.53	82.05	61.51				
BIC	85.09	84.04	85.85	71.78				
CV.lse	26.22	25.20	28.27	23.25	23.48			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 16.04
CV.min	21.83	21.47	26.06	22.17	<b>21.11</b>	21.36		
AICc	22.98	21.55	21.26	22.50			21.78	
AIC	25.54	26.06	27.54	22.37				
BIC	29.05	29.08	29.14	28.80				
CV.lse	5.02	4.99	4.96	4.61	4.79			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 2.80
CV.min	4.76	4.68	4.79	4.25	4.36	4.69		
AICc	4.74	4.81	4.76	4.23			4.70	
AIC	<b>3.92</b>	3.98	4.36	4.11				
BIC	4.86	4.86	4.83	4.81				
CV.lse	214.42	214.86	215.02	206.23	214.59			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 189.14
CV.min	206.43	212.06	214.78	214.96	206.33	207.05		
AICc	<b>205.31</b>	212.39	215.21	209.69			205.37	
AIC	310.41	321.76	335.07	261.14				
BIC	214.89	215.00	217.26	214.16				
CV.lse	72.92	72.92	72.92	72.56	72.92			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 64.15
CV.min	72.61	72.80	72.95	74.88	72.64	72.66		
AICc	<b>72.32</b>	72.89	72.96	73.92			72.31	
AIC	104.61	107.80	112.84	89.35				
BIC	72.91	72.92	72.92	72.88				
CV.lse	12.72	12.72	12.71	12.66	12.72			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 11.20
CV.min	12.53	12.53	12.53	12.57	12.51	<b>12.51</b>		
AICc	<b>12.5</b>	12.58	12.60	12.60			12.50	
AIC	16.60	17.27	18.84	12.81				
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.lse	22.06	20.83	18.60	21.21	18.31			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 17.37
CV.min	21.02	20.04	18.49	20.59	<b>18.26</b>	18.51		
AICc	21.63	20.28	19.18	20.69			19.29	
AIC	26.52	27.07	29.04	21.02				
BIC	26.07	23.17	20.23	23.08				
CV.lse	8.07	7.45	6.44	9.77	<b>6.03</b>			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 5.87
CV.min	7.79	7.30	6.54	8.91	6.04	6.54		
AICc	8.27	7.47	6.47	9.35			6.48	
AIC	8.98	9.08	9.65	8.69				
BIC	26.50	25.09	6.71	25.92				
CV.lse	1.44	1.33	1.17	3.34	<b>1.09</b>			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 1.01
CV.min	1.39	1.31	1.18	2.88	1.10	1.19		
AICc	1.51	1.35	1.16	2.90			1.16	
AIC	1.39	1.34	1.41	2.84				
BIC	4.27	4.28	3.44	4.21				
CV.lse	91.40	92.90	107.18	84.53	88.38			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 69.47
CV.min	83.20	84.26	95.00	83.92	<b>83.19</b>	83.31		
AICc	85.14	84.21	93.73	83.70			84.23	
AIC	111.39	114.82	121.21	91.72				
BIC	125.83	125.78	126.15	116.17				
CV.lse	40.67	40.08	42.55	34.99	39.34			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 23.49
CV.min	34.02	34.26	41.87	33.17	33.76	33.38		
AICc	35.81	32.73	<b>32.27</b>	33.80			33.55	
AIC	37.63	38.50	40.63	33.23				
BIC	42.62	42.64	42.67	42.42				
CV.lse	7.28	7.27	7.23	6.96	7.25			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 4.03
CV.min	6.96	6.94	6.98	6.41	6.89	6.93		
AICc	6.90	7.03	7.00	6.35			6.89	
AIC	<b>5.77</b>	5.89	6.45	5.97				
BIC	7.09	7.11	7.11	7.01				
CV.lse	315.28	315.72	315.85	304.89	315.47			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 277.88
CV.min	305.33	313.63	315.86	317.57	305.18	306.22		
AICc	<b>303.58</b>	314.44	315.81	309.81			303.59	
AIC	456.70	475.12	493.35	386.66				
BIC	315.72	315.81	351.65	314.97				
CV.lse	106.78	106.79	106.78	106.40	106.79			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 93.96
CV.min	106.43	106.70	106.84	109.83	106.46	106.57		
AICc	<b>106.08</b>	106.77	106.79	108.39			106.12	
AIC	153.36	158.62	165.71	131.58				
BIC	106.77	106.78	106.79	106.75				
CV.lse	18.33	18.33	18.32	18.28	18.33			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 16.13
CV.min	18.14	18.15	18.20	18.18	18.14	<b>18.14</b>		
AICc	<b>18.1</b>	18.22	18.29	18.23			18.10	
AIC	24.24	25.34	27.45	18.64				
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			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.37
CV.min	0.59	0.63	0.84	<b>0.51</b>	0.62	0.61		
AICc	0.72	0.67	0.54	0.56			0.54	
AIC	0.55	0.55	0.56	0.52				
BIC	0.55	0.55	0.56	0.53				
CV.1se	0.97	0.92	0.99	0.49	0.83			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.33
CV.min	0.58	0.60	0.79	<b>0.46</b>	0.59	0.59		
AICc	0.69	0.64	0.48	0.52			0.48	
AIC	0.49	0.49	0.50	0.47				
BIC	0.49	0.49	0.50	0.48				
CV.1se	0.93	0.89	0.96	0.47	0.80			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.31
CV.min	0.56	0.59	0.78	<b>0.44</b>	0.58	0.58		
AICc	0.67	0.63	0.46	0.50			0.46	
AIC	0.46	0.47	0.47	0.45				
BIC	0.46	0.47	0.47	0.46				
CV.1se	2.18	2.18	2.20	1.79	2.17			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 1.40
CV.min	1.91	2.00	2.13	2.03	1.93	1.92		
AICc	1.91	1.92	2.21	<b>1.73</b>			2.20	
AIC	2.21	2.22	2.24	2.15				
BIC	2.20	2.21	2.24	2.15				
CV.1se	1.98	1.98	1.99	1.64	1.97			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 1.26
CV.min	1.75	1.82	1.93	1.83	1.77	1.75		
AICc	1.74	1.76	1.97	<b>1.57</b>			1.97	
AIC	1.98	1.99	2.01	1.93				
BIC	1.98	1.98	2.01	1.93				
CV.1se	1.88	1.87	1.88	1.54	1.86			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 1.19
CV.min	1.66	1.72	1.82	1.72	1.67	1.67		
AICc	1.66	1.67	1.86	<b>1.5</b>			1.86	
AIC	1.87	1.88	1.90	1.83				
BIC	1.87	1.88	1.90	1.82				
CV.1se	5.67	5.67	5.68	6.91	5.67			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 5.30
CV.min	5.68	5.70	5.71	8.23	5.72	5.72		
AICc	<b>5.61</b>	7.11	8.94	6.01			8.94	
AIC	8.88	8.93	9.00	8.74				
BIC	8.87	8.92	9.00	8.73				
CV.1se	5.08	5.08	5.08	6.21	5.08			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 4.74
CV.min	5.09	5.11	5.11	7.39	5.13	5.13		
AICc	<b>5.03</b>	6.20	7.98	5.41			7.99	
AIC	7.93	7.98	8.04	7.81				
BIC	7.93	7.97	8.04	7.81				
CV.1se	4.82	4.83	4.83	5.84	4.83			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 4.52
CV.min	4.84	4.85	4.86	6.96	4.86	4.89		
AICc	<b>4.77</b>	5.83	7.57	5.14			7.56	
AIC	7.53	7.57	7.63	7.41				
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.lse	7.33	7.44	7.46	3.26	7.34			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 2.73</i>
CV.min	5.91	6.93	7.27	2.95	5.82	6.07		
AICc	6.28	3.35	3.02	4.31			3.02	
AIC	2.98	3.00	3.03	<b>2.94</b>				
BIC	2.98	3.00	3.03	<b>2.94</b>				
CV.lse	6.67	6.68	6.71	2.96	6.66			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 2.45</i>
CV.min	5.46	6.27	6.57	2.64	5.45	5.56		
AICc	5.70	3.11	2.70	3.86			2.71	
AIC	2.67	2.68	2.71	<b>2.63</b>				
BIC	2.67	2.68	2.71	<b>2.63</b>				
CV.lse	6.28	6.30	6.35	2.89	6.29			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 2.31</i>
CV.min	5.24	5.94	6.21	2.51	5.27	5.32		
AICc	5.46	3.15	2.55	3.77			2.55	
AIC	2.52	2.54	2.56	<b>2.49</b>				
BIC	2.52	2.54	2.56	<b>2.49</b>				
CV.lse	12.07	12.11	12.12	10.25	12.07			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 9.58</i>
CV.min	11.33	11.94	12.07	11.32	11.41	11.48		
AICc	11.31	11.06	12.10	<b>10.12</b>			12.09	
AIC	11.96	12.05	12.14	11.78				
BIC	11.96	12.04	12.14	11.77				
CV.lse	10.82	10.84	10.85	9.17	10.82			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 8.54</i>
CV.min	10.25	10.69	10.82	10.09	10.33	10.36		
AICc	10.15	9.82	10.78	<b>9.06</b>			10.78	
AIC	10.66	10.73	10.82	10.49				
BIC	10.65	10.72	10.82	10.49				
CV.lse	10.25	10.27	10.27	8.73	10.26			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 8.05</i>
CV.min	9.73	10.12	10.23	9.51	9.75	9.80		
AICc	9.66	9.31	10.20	<b>8.66</b>			10.21	
AIC	10.09	10.16	10.24	9.93				
BIC	10.08	10.15	10.24	9.93				
CV.lse	30.53	30.55	30.60	37.75	30.56			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 31.48</i>
CV.min	30.69	30.74	30.82	44.89	30.81	30.94		
AICc	<b>30.41</b>	45.69	48.52	32.65			48.53	
AIC	47.87	48.29	48.60	47.19				
BIC	47.84	48.27	48.60	47.17				
CV.lse	27.31	27.33	27.33	33.73	27.33			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 28.08</i>
CV.min	27.44	27.49	27.51	39.84	27.55	27.71		
AICc	<b>27.22</b>	40.56	43.22	29.07			43.30	
AIC	42.66	43.03	43.30	42.06				
BIC	42.64	43.01	43.30	42.04				
CV.lse	25.85	25.87	25.88	31.38	25.87			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 26.61</i>
CV.min	26.00	25.97	26.03	37.38	26.07	26.25		
AICc	<b>25.67</b>	38.25	40.92	27.59			41.08	
AIC	40.38	40.73	40.99	39.78				
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.lse	14.97	15.13	15.17	6.70	15.02			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 6.12
CV.min	12.62	14.61	14.91	5.99	12.53	12.89		
AICc	13.31	6.05	6.12	9.01			6.14	
AIC	6.04	6.08	6.13	<b>5.96</b>				
BIC	6.04	6.08	6.13	<b>5.96</b>				
CV.lse	13.48	13.54	13.55	6.03	13.50			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 5.45
CV.min	11.56	13.10	13.37	5.35	11.65	11.77		
AICc	11.88	5.49	5.44	8.14			5.46	
AIC	5.37	5.41	5.45	5.31				
BIC	5.37	5.41	5.45	<b>5.3</b>				
CV.lse	12.74	12.81	12.84	5.92	12.80			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 5.16
CV.min	10.99	12.38	12.67	5.11	10.93	11.21		
AICc	11.29	5.27	5.17	7.86			5.16	
AIC	5.10	5.14	5.18	<b>5.04</b>				
BIC	5.10	5.13	5.18	<b>5.04</b>				
CV.lse	24.48	24.56	24.57	20.88	24.50			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 21.34
CV.min	23.19	24.40	24.52	22.96	23.24	23.46		
AICc	23.11	23.13	24.53	<b>20.63</b>			24.52	
AIC	24.21	24.42	24.58	23.85				
BIC	24.20	24.41	24.58	23.84				
CV.lse	21.91	21.95	21.95	18.66	21.94			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 19.00
CV.min	20.91	21.80	21.92	20.46	21.03	21.13		
AICc	20.78	20.54	21.87	<b>18.48</b>			21.87	
AIC	21.58	21.76	21.91	21.26				
BIC	21.57	21.76	21.91	21.25				
CV.lse	20.67	20.71	20.72	17.65	20.70			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 17.97
CV.min	19.66	20.53	20.67	19.21	19.67	19.78		
AICc	19.53	19.34	20.61	<b>17.53</b>			20.58	
AIC	20.35	20.51	20.66	20.05				
BIC	20.34	20.50	20.66	20.04				
CV.lse	61.84	61.86	61.92	76.46	61.85			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 64.46
CV.min	62.12	62.25	62.34	90.65	62.44	62.36		
AICc	<b>61.54</b>	94.48	98.16	66.07			98.14	
AIC	96.74	97.74	98.25	95.38				
BIC	96.70	97.70	98.25	95.35				
CV.lse	55.33	55.40	55.36	68.27	55.34			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 57.58
CV.min	55.59	55.77	55.74	80.79	55.83	56.06		
AICc	<b>55.07</b>	83.89	87.52	59.02			87.55	
AIC	86.29	87.15	87.62	85.08				
BIC	86.25	87.11	87.62	85.05				
CV.lse	52.31	52.35	52.39	63.43	52.34			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 54.48
CV.min	52.51	52.62	52.66	75.65	52.69	52.76		
AICc	<b>51.93</b>	79.08	82.74	55.84			82.80	
AIC	81.57	82.38	82.83	80.38				
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.lse	30.33	30.56	30.60	13.61	30.38			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 12.55
CV.min	26.07	29.77	30.17	12.06	25.72	26.61		
AICc	27.01	12.04	12.33	18.27			12.32	
AIC	12.15	12.26	12.34	<b>12</b>				
BIC	12.15	12.26	12.34	<b>12</b>				
CV.lse	27.21	27.33	27.35	12.36	27.28			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 11.21
CV.min	23.89	26.73	27.01	10.79	23.88	24.36		
AICc	24.26	10.74	10.99	16.73			11.03	
AIC	10.83	10.93	11.00	<b>10.7</b>				
BIC	10.83	10.92	11.00	<b>10.7</b>				
CV.lse	25.68	25.79	25.82	11.97	25.74			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 10.60
CV.min	22.64	25.13	25.46	10.24	22.44	22.96		
AICc	22.74	10.23	10.38	15.86			10.38	
AIC	10.24	10.33	10.39	<b>10.12</b>				
BIC	10.23	10.32	10.39	<b>10.12</b>				
CV.lse	49.21	49.37	49.37	42.14	49.29			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 46.19
CV.min	46.77	49.09	49.30	46.25	46.84	47.45		
AICc	46.69	47.26	49.34	<b>41.64</b>			49.49	
AIC	48.63	49.11	49.40	47.93				
BIC	48.61	49.09	49.40	47.91				
CV.lse	44.03	44.14	44.15	37.50	44.11			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 41.04
CV.min	42.08	43.93	44.11	41.17	42.30	42.64		
AICc	41.73	42.04	43.94	<b>37.24</b>			43.91	
AIC	43.31	43.73	43.99	42.68				
BIC	43.29	43.72	43.99	42.67				
CV.lse	41.58	41.69	41.70	35.58	41.60			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 38.90
CV.min	39.52	41.37	41.58	38.66	39.66	39.88		
AICc	39.23	39.74	41.49	<b>35.18</b>			41.47	
AIC	40.90	41.29	41.54	40.32				
BIC	40.88	41.27	41.54	40.30				
CV.lse	124.66	124.81	124.79	154.61	124.68			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 130.14
CV.min	125.32	125.62	125.84	182.91	125.93	126.26		
AICc	<b>124.15</b>	193.36	198.18	133.05			198.35	
AIC	195.19	197.42	198.29	192.44				
BIC	195.11	197.36	198.28	192.34				
CV.lse	111.25	111.38	111.34	136.84	111.28			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 116.03
CV.min	111.79	112.04	112.02	162.37	112.21	112.54		
AICc	<b>110.75</b>	171.44	176.10	118.55			175.96	
AIC	173.46	175.42	176.20	171.07				
BIC	173.39	175.35	176.19	171.01				
CV.lse	105.14	105.23	105.25	127.70	105.21			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 109.94
CV.min	105.41	105.68	105.77	152.09	105.93	105.96		
AICc	<b>104.31</b>	161.77	166.42	112.41			166.20	
AIC	163.88	165.73	166.50	161.47				
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			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1.48
CV.min	2.44	2.60	3.40	<b>2.03</b>	2.52	2.53		
AICc	2.89	3.36	2.23	2.24			2.39	
AIC	2.20	2.21	2.24	2.10				
BIC	2.20	2.20	2.23	2.15				
CV.1se	2.01	1.97	1.89	1.04	1.82			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.56
CV.min	1.54	1.55	1.68	0.84	1.44	1.50		
AICc	1.57	1.81	1.01	1.16			1.26	
AIC	0.83	0.84	0.84	<b>0.82</b>				
BIC	0.83	0.84	0.84	0.91				
CV.1se	0.40	0.39	0.34	0.29	0.37			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.15
CV.min	0.32	0.32	0.32	0.22	0.31	0.32		
AICc	0.32	0.35	0.33	0.25			0.32	
AIC	0.22	0.22	0.22	<b>0.2</b>				
BIC	0.24	0.23	0.22	0.32				
CV.1se	8.82	8.80	8.92	7.23	8.80			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 5.62
CV.min	7.73	8.04	8.56	8.16	7.76	7.79		
AICc	7.66	8.50	8.88	<b>6.93</b>			8.56	
AIC	8.87	8.91	9.00	8.65				
BIC	8.87	8.91	9.00	8.63				
CV.1se	3.39	3.38	3.36	2.83	3.36			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 2.11
CV.min	3.11	3.16	3.26	3.07	3.11	3.10		
AICc	3.08	3.29	3.31	<b>2.79</b>			3.20	
AIC	3.35	3.36	3.39	3.28				
BIC	3.35	3.36	3.39	3.27				
CV.1se	0.84	0.82	0.74	0.72	0.79			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.56
CV.min	0.71	0.71	0.69	0.70	0.69	<b>0.69</b>		
AICc	0.70	0.74	0.71	<b>0.68</b>			0.70	
AIC	0.89	0.89	0.91	0.80				
BIC	0.89	0.89	0.91	0.70				
CV.1se	22.83	22.84	22.85	27.74	22.85			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 21.25
CV.min	22.87	22.91	23.01	33.04	22.94	22.99		
AICc	<b>22.53</b>	24.53	35.87	24.03			33.38	
AIC	35.61	35.81	36.11	35.06				
BIC	35.59	35.80	36.10	35.04				
CV.1se	8.59	8.59	8.60	10.06	8.59			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 7.97
CV.min	8.58	8.59	8.64	12.07	8.62	8.65		
AICc	<b>8.52</b>	8.61	13.38	9.09			11.49	
AIC	13.39	13.44	13.56	13.17				
BIC	13.38	13.44	13.56	13.15				
CV.1se	2.33	2.32	2.32	2.29	2.32			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 2.11
CV.min	2.26	2.26	2.29	2.53	2.26	<b>2.26</b>		
AICc	<b>2.24</b>	2.28	3.11	2.34			2.28	
AIC	3.61	3.62	3.67	3.44				
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.lse	29.84	30.21	30.39	13.26	29.97			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 11.08
CV.min	24.06	28.29	29.64	11.90	24.04	24.66		
AICc	25.41	22.67	12.22	17.14			14.70	
AIC	12.07	12.15	12.26	11.89				
BIC	12.07	12.14	12.26	<b>11.88</b>				
CV.lse	10.41	10.41	10.42	5.40	10.39			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 3.78
CV.min	9.40	9.94	10.30	4.26	9.42	9.43		
AICc	9.31	10.16	4.16	6.64			5.91	
AIC	4.13	4.15	4.18	4.09				
BIC	4.13	4.14	4.18	<b>4.08</b>				
CV.lse	1.88	1.86	1.83	1.54	1.85			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.68
CV.min	1.60	1.61	1.69	1.12	1.59	1.58		
AICc	1.55	1.78	1.31	1.26			1.53	
AIC	0.75	0.75	0.76	<b>0.74</b>				
BIC	0.75	0.75	0.76	1.38				
CV.lse	48.97	49.08	49.11	41.41	49.03			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 38.53
CV.min	46.03	48.36	48.95	45.64	46.16	46.53		
AICc	45.69	46.15	48.71	<b>40.67</b>			47.97	
AIC	48.15	48.51	48.87	47.37				
BIC	48.13	48.49	48.86	47.35				
CV.lse	16.82	16.83	16.85	14.38	16.81			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 13.23
CV.min	16.23	16.58	16.82	15.44	16.19	16.25		
AICc	16.03	16.57	16.64	<b>14.36</b>			16.44	
AIC	16.54	16.62	16.77	16.30				
BIC	16.53	16.61	16.76	16.29				
CV.lse	3.06	3.06	3.06	2.82	3.06			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 2.37
CV.min	2.89	2.90	2.99	<b>2.61</b>	2.88	2.88		
AICc	2.83	3.01	2.98	2.64			2.84	
AIC	2.99	3.00	3.04	2.88				
BIC	2.99	3.00	3.04	2.87				
CV.lse	123.67	123.68	123.80	151.41	123.69			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 126.96
CV.min	124.09	124.31	124.59	180.32	125.12	125.16		
AICc	<b>122.78</b>	181.19	195.40	131.22			183.19	
AIC	192.75	194.48	195.68	189.98				
BIC	192.67	194.40	195.66	189.91				
CV.lse	42.38	42.39	42.42	49.61	42.42			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 43.47
CV.min	42.56	42.60	42.70	59.52	42.68	42.99		
AICc	<b>42.17</b>	50.84	66.80	45.06			59.79	
AIC	66.10	66.57	67.06	65.12				
BIC	66.07	66.53	67.05	65.09				
CV.lse	7.73	7.73	7.74	7.84	7.73			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 7.75
CV.min	7.71	7.73	7.78	8.64	7.74	7.76		
AICc	<b>7.66</b>	7.72	12.06	8.10			7.97	
AIC	11.97	12.05	12.19	11.58				
BIC	11.96	12.05	12.18	10.18				

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.lse	61.16	61.57	61.63	27.47	61.23			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 24.83
CV.min	51.50	59.56	60.70	24.23	51.80	52.42		
AICc	53.49	32.73	24.78	36.31			29.58	
AIC	24.45	24.64	24.82	<b>24.13</b>				
BIC	24.44	24.63	24.82	24.14				
CV.lse	20.83	20.84	20.86	10.87	20.84			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 8.37
CV.min	19.15	20.19	20.68	8.57	19.09	19.18		
AICc	18.93	18.83	8.35	13.38			11.41	
AIC	8.26	8.30	8.37	<b>8.18</b>				
BIC	8.25	8.30	8.37	8.21				
CV.lse	3.54	3.54	3.53	3.00	3.54			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 1.42
CV.min	3.20	3.27	3.41	2.17	3.21	3.20		
AICc	3.11	3.48	1.60	2.48			3.07	
AIC	1.40	1.40	1.42	<b>1.38</b>				
BIC	1.40	1.40	1.42	2.30				
CV.lse	99.62	99.74	99.82	84.51	99.66			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 86.46
CV.min	94.55	98.98	99.72	92.58	94.75	95.42		
AICc	93.78	93.69	99.07	<b>83.67</b>			97.14	
AIC	97.75	98.62	99.27	96.27				
BIC	97.71	98.58	99.26	96.23				
CV.lse	33.64	33.67	33.71	<b>28.79</b>	33.68			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 29.19
CV.min	32.47	33.31	33.69	30.80	32.52	32.68		
AICc	32.08	32.43	33.36	28.83			33.03	
AIC	33.02	33.24	33.49	32.55				
BIC	33.00	33.22	33.49	32.53				
CV.lse	5.73	5.73	5.73	5.38	5.74			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 4.90
CV.min	5.53	5.59	5.70	<b>4.97</b>	5.53	5.53		
AICc	5.44	5.70	5.62	5.05			5.46	
AIC	5.58	5.61	5.68	5.42				
BIC	5.58	5.61	5.68	5.44				
CV.lse	250.85	250.88	251.03	307.99	251.08			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 260.93
CV.min	251.92	252.45	253.02	365.30	253.21	254.15		
AICc	<b>249.33</b>	381.45	396.97	266.84			369.87	
AIC	391.16	395.18	397.28	385.61				
BIC	390.99	395.04	397.25	385.45				
CV.lse	84.75	84.79	84.80	98.73	84.80			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 87.87
CV.min	85.25	85.31	85.31	118.99	85.26	85.82		
AICc	<b>84.43</b>	117.72	133.55	90.21			120.78	
AIC	131.83	132.94	133.82	129.89				
BIC	131.76	132.88	133.81	129.82				
CV.lse	14.44	14.44	14.45	14.67	14.45			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 14.79
CV.min	14.44	14.49	14.54	16.22	14.49	14.53		
AICc	<b>14.39</b>	14.47	22.61	15.14			15.23	
AIC	22.32	22.50	22.75	21.62				
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.lse	123.78	124.17	124.38	55.67	123.87			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 50.89</i>
CV.min	105.81	121.52	122.75	48.79	106.45	108.24		
AICc	109.36	52.25	49.94	74.35			58.01	
AIC	49.18	49.63	49.96	48.59				
BIC	49.16	49.61	49.96	<b>48.58</b>				
CV.lse	41.62	41.63	41.66	21.97	41.60			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 17.03</i>
CV.min	38.52	40.66	41.36	17.13	38.32	38.69		
AICc	37.84	29.69	16.67	26.77			22.67	
AIC	16.46	16.57	16.70	16.31				
BIC	16.45	16.57	16.69	<b>16.3</b>				
CV.lse	6.86	6.85	6.85	5.93	6.86			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 2.80</i>
CV.min	6.37	6.53	6.75	4.25	6.36	6.35		
AICc	6.19	6.79	2.75	4.94			5.95	
AIC	2.70	2.71	2.74	<b>2.67</b>				
BIC	2.69	2.71	2.74	4.17				
CV.lse	200.18	200.56	200.62	170.55	200.38			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 186.60</i>
CV.min	190.91	199.28	200.41	186.30	190.80	193.05		
AICc	189.24	191.81	199.68	<b>168.56</b>			197.28	
AIC	196.78	198.74	199.88	193.84				
BIC	196.71	198.66	199.87	193.77				
CV.lse	67.24	67.30	67.34	<b>57.55</b>	67.30			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 62.50</i>
CV.min	64.84	66.87	67.31	61.27	64.94	65.33		
AICc	64.19	63.51	66.78	<b>57.55</b>			66.20	
AIC	65.93	66.46	66.92	65.00				
BIC	65.88	66.43	66.91	64.97				
CV.lse	11.08	11.07	11.08	10.48	11.08			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10.21</i>
CV.min	10.75	10.89	11.04	<b>9.69</b>	10.77	10.78		
AICc	10.58	11.04	10.92	9.86			10.61	
AIC	10.79	10.87	10.99	10.50				
BIC	10.79	10.87	10.99	10.60				
CV.lse	505.57	505.68	505.88	621.63	505.30			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 527.53</i>
CV.min	507.03	508.25	509.82	736.30	509.71	511.25		
AICc	<b>502.04</b>	779.80	797.64	536.72			735.78	
AIC	787.28	796.26	799.84	776.11				
BIC	786.99	795.99	799.78	775.79				
CV.lse	169.34	169.55	169.49	197.63	169.47			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 176.63</i>
CV.min	170.16	170.31	170.41	237.39	170.31	171.26		
AICc	<b>168.77</b>	252.44	267.51	180.60			241.61	
AIC	263.70	266.29	267.81	259.78				
BIC	263.52	266.19	267.78	259.63				
CV.lse	27.83	27.83	27.85	28.27	27.84			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 28.81</i>
CV.min	27.80	27.97	28.03	31.23	27.92	27.95		
AICc	<b>27.75</b>	28.33	43.63	29.27			29.04	
AIC	43.01	43.43	43.86	41.67				
BIC	42.99	43.41	43.84	36.55				

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	<b>0.4</b>	0.47			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.27
CV.min	0.42	<b>0.4</b>	0.46	0.41	<b>0.4</b>	<b>0.41</b>		
AICc	0.48	0.43	0.46	<b>0.4</b>			0.45	
AIC	0.47	0.47	0.48	0.44				
BIC	0.47	0.47	0.48	0.44				
CV.1se	0.65	0.57	0.63	0.38	0.46			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.24
CV.min	0.40	0.38	0.45	0.38	<b>0.37</b>	<b>0.38</b>		
AICc	0.47	0.41	0.41	0.39			0.41	
AIC	0.42	0.42	0.43	0.40				
BIC	0.42	0.42	0.43	0.40				
CV.1se	0.64	0.56	0.63	<b>0.36</b>	0.45			sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.23
CV.min	0.39	0.38	0.45	<b>0.36</b>	<b>0.36</b>	<b>0.38</b>		
AICc	0.46	0.40	0.38	0.38			<b>0.38</b>	
AIC	0.40	0.40	0.41	0.38				
BIC	0.40	0.40	0.41	0.38				
CV.1se	1.86	1.86	1.89	1.52	1.84			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 1.09
CV.min	1.58	1.65	1.78	1.74	1.60	1.59		
AICc	1.58	1.60	1.91	<b>1.45</b>			1.91	
AIC	1.91	1.92	1.94	1.86				
BIC	1.91	1.92	1.94	1.85				
CV.1se	1.69	1.68	1.70	1.39	1.67			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.97
CV.min	1.46	1.50	1.62	1.57	1.47	1.46		
AICc	1.45	1.46	1.70	<b>1.32</b>			1.70	
AIC	1.71	1.72	1.74	1.66				
BIC	1.71	1.72	1.73	1.66				
CV.1se	1.60	1.60	1.62	1.31	1.58			sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.92
CV.min	1.39	1.43	1.54	1.48	1.40	1.39		
AICc	1.39	1.40	1.61	<b>1.26</b>			1.61	
AIC	1.62	1.63	1.64	1.58				
BIC	1.62	1.63	1.64	1.57				
CV.1se	4.92	4.92	4.93	5.99	4.92			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 4.35
CV.min	4.92	4.94	4.97	7.11	4.96	4.96		
AICc	<b>4.87</b>	5.98	7.74	5.20			7.74	
AIC	7.69	7.74	7.80	7.57				
BIC	7.69	7.73	7.80	7.57				
CV.1se	4.40	4.40	4.41	5.38	4.40			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 3.90
CV.min	4.41	4.42	4.43	6.39	4.44	4.44		
AICc	<b>4.36</b>	5.23	6.91	4.66			6.91	
AIC	6.87	6.91	6.97	6.77				
BIC	6.87	6.91	6.97	6.76				
CV.1se	4.18	4.18	4.18	5.02	4.18			sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 3.69
CV.min	4.18	4.19	4.21	6.00	4.20	4.21		
AICc	<b>4.13</b>	4.86	6.53	4.42			6.54	
AIC	6.50	6.54	6.59	6.40				
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.lse	1.47	1.35	1.90	0.84	1.13			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 0.56</i>
CV.min	0.91	0.88	1.34	0.86	0.87	0.87		
AICc	1.06	<b>0.83</b>	0.97	0.86			0.97	
AIC	0.98	0.98	1.00	0.93				
BIC	0.98	0.98	1.00	0.92				
CV.lse	1.54	1.43	1.82	<b>0.79</b>	1.17			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 0.50</i>
CV.min	0.89	0.89	1.39	<b>0.79</b>	0.85	0.86		
AICc	1.07	<b>0.79</b>	0.86	0.83			0.86	
AIC	0.88	0.88	0.89	0.84				
BIC	0.88	0.88	0.89	0.84				
CV.lse	1.50	1.40	1.78	<b>0.76</b>	1.18			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.48</i>
CV.min	0.87	0.90	1.37	<b>0.76</b>	0.84	0.85		
AICc	1.05	0.79	0.81	0.82			0.82	
AIC	0.83	0.83	0.84	0.79				
BIC	0.83	0.83	0.84	0.79				
CV.lse	3.93	3.96	4.00	3.22	3.93			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 2.25</i>
CV.min	3.41	3.65	3.89	3.67	3.44	3.45		
AICc	3.43	3.42	3.99	<b>3.09</b>			3.99	
AIC	3.97	3.99	4.03	3.87				
BIC	3.96	3.99	4.03	3.86				
CV.lse	3.54	3.54	3.58	2.93	3.54			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 2.01</i>
CV.min	3.14	3.32	3.49	3.29	3.17	3.16		
AICc	3.13	3.09	3.55	<b>2.82</b>			3.56	
AIC	3.54	3.56	3.59	3.46				
BIC	3.54	3.55	3.59	3.45				
CV.lse	3.34	3.36	3.38	2.77	3.33			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 1.90</i>
CV.min	2.98	3.15	3.30	3.08	3.00	3.00		
AICc	2.98	2.94	3.35	<b>2.68</b>			3.34	
AIC	3.34	3.35	3.39	3.26				
BIC	3.33	3.35	3.39	3.26				
CV.lse	10.17	10.17	10.19	12.43	10.17			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 9.00</i>
CV.min	10.17	10.22	10.26	14.81	10.28	10.23		
AICc	<b>10.09</b>	14.04	16.09	10.77			16.07	
AIC	15.93	16.04	16.16	15.68				
BIC	15.92	16.03	16.16	15.66				
CV.lse	9.09	9.10	9.11	11.13	9.10			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 8.05</i>
CV.min	9.13	9.13	9.16	13.22	9.18	9.18		
AICc	<b>9.02</b>	12.34	14.33	9.64			14.32	
AIC	14.20	14.29	14.40	13.98				
BIC	14.19	14.29	14.40	13.97				
CV.lse	8.59	8.60	8.60	10.43	8.59			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 7.61</i>
CV.min	8.62	8.64	8.65	12.40	8.66	8.71		
AICc	<b>8.52</b>	11.58	13.53	9.14			13.53	
AIC	13.40	13.49	13.60	13.19				
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.lse	1.64	1.52	2.13	0.93	1.27			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 0.62</i>
CV.min	1.01	0.98	1.54	0.96	0.97	0.98		
AICc	1.18	<b>0.92</b>	1.08	0.96			1.08	
AIC	1.09	1.09	1.11	1.03				
BIC	1.09	1.09	1.11	1.02				
CV.lse	1.73	1.61	2.07	0.88	1.31			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 0.56</i>
CV.min	1.00	1.00	1.58	0.88	0.95	0.96		
AICc	1.19	<b>0.86</b>	0.96	0.92			0.96	
AIC	0.97	0.97	0.99	0.93				
BIC	0.97	0.97	0.99	0.93				
CV.lse	1.68	1.57	2.00	0.85	1.33			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.53</i>
CV.min	0.97	1.02	1.56	<b>0.84</b>	0.93	0.95		
AICc	1.17	0.86	0.91	0.90			0.91	
AIC	0.92	0.92	0.93	0.88				
BIC	0.92	0.92	0.93	0.88				
CV.lse	4.37	4.39	4.44	3.57	4.36			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 2.50</i>
CV.min	3.79	4.08	4.32	4.07	3.83	3.85		
AICc	3.81	3.81	4.44	<b>3.44</b>			4.44	
AIC	4.41	4.43	4.48	4.30				
BIC	4.40	4.43	4.48	4.29				
CV.lse	3.93	3.94	3.97	3.25	3.93			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 2.23</i>
CV.min	3.50	3.70	3.89	3.66	3.54	3.54		
AICc	3.48	3.43	3.95	<b>3.13</b>			3.95	
AIC	3.93	3.95	3.99	3.84				
BIC	3.93	3.95	3.99	3.84				
CV.lse	3.72	3.74	3.76	3.08	3.71			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 2.11</i>
CV.min	3.31	3.52	3.68	3.43	3.34	3.34		
AICc	3.32	3.26	3.73	<b>2.98</b>			3.73	
AIC	3.71	3.73	3.77	3.63				
BIC	3.71	3.73	3.77	3.63				
CV.lse	11.29	11.30	11.32	13.82	11.30			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 9.99</i>
CV.min	11.31	11.36	11.41	16.47	11.43	11.40		
AICc	<b>11.21</b>	15.81	17.90	11.99			17.88	
AIC	17.71	17.84	17.97	17.43				
BIC	17.70	17.83	17.97	17.42				
CV.lse	10.09	10.09	10.10	12.37	10.09			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 8.94</i>
CV.min	10.15	10.14	10.17	14.68	10.19	10.25		
AICc	<b>10</b>	13.91	15.92	10.71			15.95	
AIC	15.76	15.87	15.99	15.52				
BIC	15.76	15.86	15.99	15.51				
CV.lse	9.54	9.55	9.56	11.59	9.54			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 8.45</i>
CV.min	9.59	9.59	9.61	13.78	9.62	9.66		
AICc	<b>9.46</b>	13.05	15.04	10.15			15.03	
AIC	14.89	14.99	15.10	14.65				
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.lse	1.73	1.60	2.24	0.98	1.33			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 0.66</i>
CV.min	1.07	1.04	1.63	1.01	1.03	1.02		
AICc	1.24	<b>0.96</b>	1.14	1.01			1.14	
AIC	1.15	1.15	1.17	1.09				
BIC	1.15	1.15	1.17	1.08				
CV.lse	1.83	1.71	2.19	0.92	1.39			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 0.59</i>
CV.min	1.05	1.06	1.68	0.93	1.00	1.02		
AICc	1.25	<b>0.9</b>	1.02	0.97			1.02	
AIC	1.03	1.03	1.04	0.98				
BIC	1.03	1.03	1.04	0.98				
CV.lse	1.77	1.66	2.11	<b>0.89</b>	1.41			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.56</i>
CV.min	1.02	1.08	1.65	<b>0.89</b>	0.99	1.01		
AICc	1.24	0.90	0.96	0.95			0.96	
AIC	0.97	0.97	0.99	0.93				
BIC	0.97	0.97	0.99	0.93				
CV.lse	4.60	4.63	4.68	3.77	4.60			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 2.63</i>
CV.min	4.00	4.31	4.56	4.29	4.04	4.06		
AICc	4.02	4.02	4.68	<b>3.62</b>			4.68	
AIC	4.64	4.67	4.72	4.53				
BIC	4.64	4.67	4.72	4.52				
CV.lse	4.15	4.16	4.20	3.44	4.15			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 2.36</i>
CV.min	3.69	3.92	4.11	3.86	3.73	3.75		
AICc	3.68	3.62	4.18	<b>3.31</b>			4.18	
AIC	4.15	4.18	4.22	4.06				
BIC	4.15	4.17	4.22	4.06				
CV.lse	3.92	3.95	3.97	3.25	3.91			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 2.23</i>
CV.min	3.50	3.71	3.88	3.62	3.53	3.53		
AICc	3.51	3.44	3.94	<b>3.14</b>			3.93	
AIC	3.91	3.94	3.97	3.83				
BIC	3.91	3.93	3.97	3.82				
CV.lse	11.92	11.93	11.95	14.58	11.93			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10.54</i>
CV.min	11.93	11.99	12.04	17.34	12.05	12.01		
AICc	<b>11.84</b>	16.71	18.88	12.64			18.88	
AIC	18.67	18.80	18.95	18.38				
BIC	18.66	18.80	18.95	18.37				
CV.lse	10.65	10.66	10.67	13.06	10.65			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 9.44</i>
CV.min	10.72	10.71	10.73	15.50	10.77	10.78		
AICc	<b>10.57</b>	14.75	16.82	11.29			16.83	
AIC	16.65	16.76	16.89	16.39				
BIC	16.64	16.75	16.89	16.38				
CV.lse	10.06	10.07	10.07	12.21	10.06			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 8.92</i>
CV.min	10.12	10.13	10.12	14.51	10.13	10.21		
AICc	<b>9.97</b>	13.86	15.85	10.70			15.87	
AIC	15.69	15.79	15.92	15.44				
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.lse	2.65	2.33	2.63	1.63	1.93			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1.09
CV.min	1.71	1.64	1.90	1.64	<b>1.61</b>	1.65		
AICc	1.96	1.96	1.87	1.63			1.85	
AIC	1.89	1.89	1.92	1.77				
BIC	1.89	1.89	1.92	1.77				
CV.lse	1.76	1.68	1.59	0.92	1.46			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.43
CV.min	1.27	1.26	1.37	0.75	1.13	1.22		
AICc	1.32	1.51	0.95	1.00			1.08	
AIC	0.75	0.75	0.76	<b>0.73</b>				
BIC	0.75	0.75	0.76	0.85				
CV.lse	0.38	0.36	0.32	0.26	0.33			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.11
CV.min	0.29	0.29	0.29	0.20	0.28	0.28		
AICc	0.29	0.33	0.32	0.22			0.29	
AIC	0.19	0.19	0.20	<b>0.18</b>				
BIC	0.20	0.20	0.20	0.30				
CV.lse	7.53	7.48	7.59	6.10	7.45			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 4.37
CV.min	6.40	6.61	7.19	6.97	6.46	6.47		
AICc	6.35	7.08	7.66	<b>5.83</b>			7.24	
AIC	7.68	7.71	7.80	7.45				
BIC	7.67	7.71	7.80	7.42				
CV.lse	3.04	3.03	3.00	2.54	3.00			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 1.71
CV.min	2.76	2.79	2.88	2.75	2.75	2.74		
AICc	2.72	2.92	2.94	<b>2.47</b>			2.85	
AIC	3.01	3.02	3.05	2.93				
BIC	3.00	3.01	3.04	2.92				
CV.lse	0.76	0.74	0.68	0.65	0.71			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.45
CV.min	0.65	0.64	0.63	0.62	0.63	0.63		
AICc	0.64	0.68	0.66	<b>0.61</b>			0.64	
AIC	0.78	0.78	0.80	0.71				
BIC	0.78	0.78	0.80	0.64				
CV.lse	19.79	19.80	19.81	23.84	19.80			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 17.46
CV.min	19.76	19.83	19.97	28.51	19.86	19.92		
AICc	<b>19.54</b>	20.74	31.03	20.74			28.50	
AIC	30.82	30.99	31.25	30.32				
BIC	30.81	30.98	31.25	30.30				
CV.lse	7.76	7.76	7.77	9.11	7.76			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 6.84
CV.min	7.76	7.77	7.81	10.85	7.79	7.80		
AICc	<b>7.68</b>	7.76	12.06	8.19			10.37	
AIC	12.08	12.13	12.24	11.88				
BIC	12.07	12.12	12.23	11.86				
CV.lse	2.04	2.04	2.04	2.02	2.04			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 1.80
CV.min	2.00	2.00	2.02	2.23	2.00	2.01		
AICc	<b>1.98</b>	2.01	2.75	2.08			2.01	
AIC	3.16	3.17	3.21	3.02				
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.lse	6.03	5.47	7.37	<b>3.39</b>	4.50			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 2.26</i>
CV.min	3.66	3.54	5.12	3.45	3.45	3.51		
AICc	4.24	3.93	3.83	3.46			3.86	
AIC	3.93	3.94	4.01	3.72				
BIC	3.93	3.94	4.00	3.71				
CV.lse	3.71	3.68	3.68	1.86	3.59			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 0.86</i>
CV.min	2.90	3.04	3.39	1.52	2.83	2.85		
AICc	2.94	3.45	1.54	2.11			2.14	
AIC	1.51	1.51	1.53	<b>1.48</b>				
BIC	1.51	1.51	1.53	1.51				
CV.lse	0.76	0.73	0.66	0.55	0.64			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.19</i>
CV.min	0.55	0.55	0.57	0.41	0.54	0.54		
AICc	0.56	0.68	0.61	0.47			0.56	
AIC	0.34	0.34	0.34	<b>0.33</b>				
BIC	0.34	0.34	0.34	0.55				
CV.lse	15.86	15.92	16.11	12.87	15.83			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 9.05</i>
CV.min	13.74	14.70	15.65	14.59	13.88	13.91		
AICc	13.72	15.18	16.02	<b>12.39</b>			15.45	
AIC	15.92	16.01	16.18	15.51				
BIC	15.91	16.00	16.18	15.49				
CV.lse	6.15	6.15	6.15	5.16	6.14			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 3.43</i>
CV.min	5.74	5.87	6.06	5.58	5.74	5.75		
AICc	5.67	6.04	6.02	<b>5.09</b>			5.91	
AIC	6.05	6.07	6.13	5.93				
BIC	6.05	6.07	6.13	5.92				
CV.lse	1.38	1.37	1.35	1.20	1.34			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 0.78</i>
CV.min	1.24	1.24	1.28	<b>1.13</b>	1.21	1.21		
AICc	1.22	1.34	1.32	<b>1.13</b>			1.21	
AIC	1.36	1.37	1.38	1.30				
BIC	1.36	1.36	1.38	1.25				
CV.lse	41.10	41.10	41.16	49.82	41.10			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 36.24</i>
CV.min	41.17	41.36	41.49	59.63	41.39	41.46		
AICc	<b>40.65</b>	49.38	64.74	43.30			59.90	
AIC	64.05	64.49	65.00	63.04				
BIC	64.02	64.47	64.99	63.01				
CV.lse	15.53	15.54	15.54	18.34	15.53			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 13.70</i>
CV.min	15.56	15.59	15.65	21.83	15.63	15.68		
AICc	<b>15.41</b>	15.84	24.32	16.43			21.33	
AIC	24.20	24.32	24.53	23.82				
BIC	24.18	24.31	24.52	23.81				
CV.lse	3.54	3.54	3.54	3.58	3.54			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 3.12</i>
CV.min	3.52	3.54	3.55	3.95	3.53	3.54		
AICc	<b>3.49</b>	3.53	5.40	3.67			3.57	
AIC	5.47	5.49	5.56	5.28				
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.lse	6.74	6.11	8.34	<b>3.77</b>	5.04			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 2.52</i>
CV.min	4.07	3.93	5.96	3.83	3.85	3.91		
AICc	4.70	4.30	4.30	3.84			4.30	
AIC	4.38	4.39	4.46	4.14				
BIC	4.37	4.39	4.46	4.13				
CV.lse	4.12	4.10	4.10	2.07	4.02			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 0.95</i>
CV.min	3.23	3.39	3.79	1.69	3.19	3.20		
AICc	3.30	3.84	1.71	2.35			2.40	
AIC	1.67	1.68	1.70	<b>1.64</b>				
BIC	1.67	1.68	1.70	1.69				
CV.lse	0.84	0.81	0.74	0.61	0.71			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.21</i>
CV.min	0.61	0.61	0.63	0.46	0.60	0.60		
AICc	0.62	0.75	0.66	0.51			0.62	
AIC	0.37	0.37	0.38	<b>0.36</b>				
BIC	0.37	0.38	0.38	0.59				
CV.lse	17.65	17.73	17.88	14.30	17.57			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 10.05</i>
CV.min	15.29	16.38	17.43	16.22	15.41	15.43		
AICc	15.27	16.82	17.83	<b>13.78</b>			17.13	
AIC	17.69	17.80	17.98	17.24				
BIC	17.68	17.79	17.98	17.21				
CV.lse	6.83	6.83	6.83	5.74	6.82			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 3.80</i>
CV.min	6.38	6.54	6.74	6.19	6.38	6.39		
AICc	6.30	6.72	6.70	<b>5.66</b>			6.54	
AIC	6.71	6.74	6.80	6.59				
BIC	6.71	6.73	6.80	6.58				
CV.lse	1.53	1.52	1.50	1.33	1.49			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 0.86</i>
CV.min	1.37	1.37	1.43	<b>1.25</b>	1.35	1.35		
AICc	1.35	1.49	1.45	<b>1.25</b>			1.35	
AIC	1.50	1.51	1.53	1.44				
BIC	1.50	1.51	1.53	1.40				
CV.lse	45.57	45.59	45.62	55.20	45.57			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 40.18</i>
CV.min	45.65	45.85	45.98	66.11	45.94	46.01		
AICc	<b>45.06</b>	56.09	71.78	48.00			66.96	
AIC	70.97	71.48	72.03	69.85				
BIC	70.94	71.46	72.01	69.82				
CV.lse	17.26	17.26	17.27	20.38	17.26			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 15.23</i>
CV.min	17.28	17.32	17.40	24.29	17.37	17.39		
AICc	<b>17.13</b>	17.71	27.06	18.28			23.99	
AIC	26.90	27.05	27.27	26.48				
BIC	26.89	27.04	27.27	26.47				
CV.lse	3.90	3.90	3.90	3.96	3.90			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 3.44</i>
CV.min	3.89	3.90	3.92	4.37	3.90	3.92		
AICc	<b>3.86</b>	3.90	5.99	4.06			4.01	
AIC	6.03	6.06	6.14	5.83				
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.lse	7.14	6.46	8.81	<b>3.97</b>	5.31			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 2.65</i>
CV.min	4.29	4.15	6.14	4.04	4.07	4.12		
AICc	5.01	4.53	4.53	4.04			4.51	
AIC	4.62	4.63	4.71	4.36				
BIC	4.61	4.62	4.70	4.35				
CV.lse	4.35	4.31	4.32	2.18	4.24			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 1.00</i>
CV.min	3.40	3.59	4.01	1.78	3.37	3.37		
AICc	3.48	4.06	1.81	2.47			2.54	
AIC	1.77	1.77	1.79	<b>1.73</b>				
BIC	1.77	1.77	1.79	1.79				
CV.lse	0.89	0.85	0.78	0.65	0.75			$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 0.23</i>
CV.min	0.64	0.64	0.67	0.49	0.63	0.63		
AICc	0.66	0.79	0.69	0.54			0.66	
AIC	0.39	0.40	0.40	<b>0.38</b>				
BIC	0.39	0.40	0.40	0.62				
CV.lse	18.66	18.75	18.91	15.12	18.55			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 10.62</i>
CV.min	16.14	17.34	18.41	17.11	16.33	16.36		
AICc	16.16	17.75	18.84	<b>14.55</b>			18.25	
AIC	18.68	18.80	18.99	18.21				
BIC	18.67	18.79	18.99	18.18				
CV.lse	7.19	7.19	7.19	6.05	7.19			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 4.01</i>
CV.min	6.72	6.89	7.10	6.52	6.72	6.74		
AICc	6.63	7.07	7.06	<b>5.96</b>			6.89	
AIC	7.07	7.10	7.17	6.94				
BIC	7.07	7.10	7.17	6.93				
CV.lse	1.61	1.60	1.58	1.40	1.56			$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 0.91</i>
CV.min	1.45	1.45	1.50	<b>1.32</b>	1.42	1.42		
AICc	1.42	1.57	1.53	<b>1.32</b>			1.43	
AIC	1.59	1.59	1.61	1.52				
BIC	1.58	1.59	1.61	1.47				
CV.lse	48.12	48.15	48.19	58.23	48.13			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 42.43</i>
CV.min	48.20	48.43	48.57	69.84	48.51	48.58		
AICc	<b>47.6</b>	59.96	75.78	50.67			70.76	
AIC	74.93	75.47	76.04	73.75				
BIC	74.89	75.44	76.03	73.72				
CV.lse	18.22	18.22	18.23	21.49	18.22			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 16.07</i>
CV.min	18.26	18.28	18.35	25.58	18.33	18.34		
AICc	<b>18.08</b>	18.83	28.56	19.27			24.76	
AIC	28.38	28.53	28.78	27.94				
BIC	28.36	28.52	28.77	27.92				
CV.lse	4.11	4.11	4.11	4.17	4.11			$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 3.62</i>
CV.min	4.10	4.11	4.14	4.61	4.11	4.13		
AICc	<b>4.07</b>	4.11	6.32	4.28			4.19	
AIC	6.36	6.39	6.47	6.14				
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.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.327	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.317	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.317		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.317		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.328		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.295	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.286	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.286		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.286		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.297		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.281	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.272	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.272		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.272		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.283		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.246	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.276	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.266		
AIC	0.010	0.010	0.013	1.313		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.267		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.118	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.146	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.135		
AIC	0.009	0.010	0.011	1.180		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.142		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.063	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.084	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.078		
AIC	0.008	0.009	0.010	1.114		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.086		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	4.898	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	5.206	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	5.084		
AIC	0.049	0.060	0.124	6.069		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	4.955		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	4.394	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	4.670	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	4.552		
AIC	0.044	0.052	0.106	5.443		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	4.459		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	4.169	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	4.402	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	4.310		
AIC	0.038	0.046	0.093	5.079		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	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.lse	0.001	<b>0</b>	0.001	2.152	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	2.073	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.001	2.086		
AIC	0.011	0.012	0.021	2.074		
BIC	0.009	0.007	0.003	2.466		
CV.lse	0.001	<b>0</b>	<b>0</b>	1.950	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.872	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.886		
AIC	0.010	0.011	0.018	1.871		
BIC	0.010	0.008	0.002	2.266		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.853	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.775	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.789		
AIC	0.010	0.010	0.016	1.771		
BIC	0.010	0.008	0.002	2.165		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.012	7.835	0.011	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	7.853	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.018	7.797		
AIC	0.065	0.081	0.167	8.518		
BIC	0.018	0.016	0.018	8.899		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.011	7.048	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	7.049	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.015	7.009		
AIC	0.058	0.071	0.143	7.652		
BIC	0.019	0.017	0.018	8.140		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.012	6.691	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	6.666	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.014	6.640		
AIC	0.051	0.063	0.126	7.179		
BIC	0.019	0.017	0.018	7.765		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	28.909	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.011
CV.min	<b>0.02</b>	0.021	0.022	30.228	<b>0.02</b>	
AICc	<b>0.02</b>	0.023	0.042	29.490		
AIC	0.366	0.541	1.226	36.584		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	30.299		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	25.851	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	0.021	26.996	<b>0.02</b>	
AICc	<b>0.02</b>	0.022	0.044	26.364		
AIC	0.321	0.465	1.038	32.773		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	26.972		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	24.469	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	0.021	25.451	<b>0.02</b>	
AICc	<b>0.02</b>	0.021	0.037	24.912		
AIC	0.282	0.409	0.913	30.656		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	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.lse	0.012	0.012	0.014	4.956	<b>0.011</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.004
CV.min	<b>0.011</b>	<b>0.011</b>	0.012	4.695	<b>0.011</b>	
AICc	0.012	<b>0.011</b>	0.014	4.815		
AIC	0.028	0.033	0.060	4.645		
BIC	0.038	0.024	0.018	6.801		
CV.lse	0.012	0.011	0.013	4.503	0.011	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.003
CV.min	0.011	<b>0.01</b>	0.011	4.251	<b>0.01</b>	
AICc	0.012	0.011	0.012	4.374		
AIC	0.025	0.029	0.051	4.189		
BIC	0.044	0.026	0.016	6.478		
CV.lse	0.011	0.011	0.012	4.298	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	4.038	<b>0.01</b>	
AICc	0.012	<b>0.01</b>	0.011	4.166		
AIC	0.022	0.026	0.045	3.966		
BIC	0.045	0.027	0.016	6.314		
CV.lse	0.033	0.036	0.047	17.232	0.032	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.013
CV.min	<b>0.029</b>	0.031	0.044	17.042	<b>0.029</b>	
AICc	0.030	0.031	0.058	17.035		
AIC	0.153	0.206	0.438	18.371		
BIC	0.050	0.049	0.050	22.969		
CV.lse	0.034	0.036	0.047	15.520	0.033	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.012
CV.min	<b>0.029</b>	0.030	0.042	15.309	<b>0.029</b>	
AICc	0.030	0.030	0.052	15.325		
AIC	0.135	0.178	0.371	16.446		
BIC	0.050	0.050	0.050	20.830		
CV.lse	0.034	0.036	0.047	14.725	0.033	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	<b>0.029</b>	0.030	0.041	14.478	<b>0.029</b>	
AICc	0.030	<b>0.029</b>	0.048	14.519		
AIC	0.119	0.157	0.326	15.468		
BIC	0.050	0.050	0.050	19.694		
CV.lse	0.050	0.050	0.050	59.962	0.050	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.035
CV.min	0.048	0.050	0.051	62.566	0.048	
AICc	<b>0.047</b>	0.064	0.084	60.970		
AIC	0.787	1.298	2.923	76.055		
BIC	0.050	0.050	0.050	61.780		
CV.lse	0.050	0.050	0.050	53.461	0.050	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.032
CV.min	<b>0.048</b>	0.050	0.050	55.742	<b>0.048</b>	
AICc	<b>0.048</b>	0.059	0.086	54.383		
AIC	0.685	1.102	2.446	67.971		
BIC	0.050	0.050	0.050	54.813		
CV.lse	0.050	0.050	0.050	50.504	0.050	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.030
CV.min	0.049	0.050	0.050	52.515	0.049	
AICc	<b>0.048</b>	0.058	0.077	51.289		
AIC	0.599	0.962	2.148	63.527		
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.lse	0.045	0.051	0.073	11.519	0.044	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.022
CV.min	<b>0.041</b>	0.045	0.064	10.643	<b>0.041</b>	
AICc	0.050	0.049	0.063	11.423		
AIC	0.073	0.091	0.165	10.286		
BIC	0.100	0.100	0.084	28.560		
CV.lse	0.046	0.050	0.070	10.534	0.044	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.020
CV.min	0.040	0.043	0.061	9.689	<b>0.039</b>	
AICc	0.051	0.048	0.056	10.446		
AIC	0.065	0.079	0.141	9.284		
BIC	0.100	0.100	0.086	26.122		
CV.lse	0.044	0.048	0.068	10.077	0.042	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.020
CV.min	0.038	0.041	0.057	9.205	<b>0.037</b>	
AICc	0.051	0.046	0.052	9.991		
AIC	0.058	0.071	0.125	8.774		
BIC	0.100	0.100	0.085	24.745		
CV.lse	0.085	0.097	0.100	37.260	0.085	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.051
CV.min	<b>0.076</b>	0.092	0.102	36.419	<b>0.076</b>	
AICc	0.079	0.090	0.174	36.800		
AIC	0.341	0.501	1.066	38.733		
BIC	0.100	0.100	0.100	49.271		
CV.lse	0.088	0.098	0.100	33.534	0.087	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.046
CV.min	<b>0.076</b>	0.090	0.101	32.694	<b>0.076</b>	
AICc	0.080	0.085	0.155	33.103		
AIC	0.299	0.430	0.902	34.602		
BIC	0.100	0.100	0.100	43.762		
CV.lse	0.089	0.097	0.100	31.823	0.088	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.043
CV.min	<b>0.075</b>	0.089	0.100	30.897	<b>0.075</b>	
AICc	0.080	0.083	0.140	31.341		
AIC	0.263	0.377	0.791	32.503		
BIC	0.100	0.100	0.100	41.208		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	122.287	<b>0.1</b>	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.101
CV.min	<b>0.1</b>	0.101	0.102	127.558	<b>0.1</b>	
AICc	<b>0.1</b>	0.170	0.142	124.377		
AIC	1.633	3.025	6.593	155.355		
BIC	<b>0.1</b>	<b>0.1</b>	0.263	124.518		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	108.720	<b>0.1</b>	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.093
CV.min	<b>0.1</b>	0.101	0.101	113.445	<b>0.1</b>	
AICc	<b>0.1</b>	0.151	0.136	110.585		
AIC	1.417	2.558	5.552	138.308		
BIC	<b>0.1</b>	<b>0.1</b>	0.130	110.289		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	102.616	<b>0.1</b>	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.088
CV.min	<b>0.1</b>	0.101	0.101	106.748	<b>0.1</b>	
AICc	<b>0.1</b>	0.143	0.131	104.334		
AIC	1.238	2.230	4.877	129.462		
BIC	<b>0.1</b>	<b>0.1</b>	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.lse	0	0	0	1.315	0	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0	0	0	1.273	0	
AICc	0	0	0	1.274		
AIC	0	0	0	1.273		
BIC	0	0	0	1.319		
CV.lse	0	0	0	0.610	0	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0	0	0	0.586	0	
AICc	0	0	0	0.586		
AIC	0	0	0	0.586		
BIC	0	0	0	0.606		
CV.lse	0	0	0	0.174	0	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0	0	0	0.167	0	
AICc	0	0	0	0.167		
AIC	0	0	0	0.167		
BIC	0	0	0	0.167		
CV.lse	0	0	0	5.000	0	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0	0	0	5.128	0	
AICc	0	0	0	5.078		
AIC	0.009	0.010	0.010	5.273		
BIC	0	0	0	5.090		
CV.lse	0	0	0	2.083	0	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0	0	0	2.069	0	
AICc	0	0	0	2.065		
AIC	0	0	0.001	2.075		
BIC	0	0	0	2.230		
CV.lse	0	0	0	0.544	0	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0	0	0	0.523	0	
AICc	0	0	0	0.523		
AIC	0	0	0	0.523		
BIC	0	0	0	0.537		
CV.lse	0	0	0	19.703	0	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0	0	0	20.923	0	
AICc	0	0	0	20.418		
AIC	0.040	0.048	0.099	24.317		
BIC	0	0	0	19.916		
CV.lse	0	0	0	7.931	0	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0	0	0	8.186	0	
AICc	0	0	0	8.095		
AIC	0.019	0.021	0.042	8.893		
BIC	0	0	0	8.112		
CV.lse	0	0	0	2.050	0	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0	0	0	2.023	0	
AICc	0	0	0	2.025		
AIC	0.009	0.010	0.019	2.034		
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.lse	<b>0</b>	<b>0</b>	<b>0</b>	8.620	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	8.311	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	8.361		
AIC	0.010	0.010	0.018	8.317		
BIC	0.009	0.007	0.004	9.857		
CV.lse	0.005	0.002	<b>0</b>	3.801	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	3.525	<b>0</b>	
AICc	0.005	<b>0</b>	<b>0</b>	3.595		
AIC	0.002	0.003	0.010	3.490		
BIC	0.016	0.011	0.006	5.592		
CV.lse	0.008	0.005	0.001	1.172	0.001	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.001	<b>0</b>	<b>0</b>	1.100	<b>0</b>	
AICc	0.009	0.005	<b>0</b>	1.101		
AIC	0.001	<b>0</b>	<b>0</b>	1.101		
BIC	0.020	0.020	0.020	1.249		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.011	31.413	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	31.517	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.012	31.267		
AIC	0.052	0.065	0.133	34.153		
BIC	0.018	0.017	0.020	35.773		
CV.lse	0.017	0.014	0.013	12.681	0.011	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	12.242	<b>0.01</b>	
AICc	0.012	<b>0.01</b>	<b>0.01</b>	12.337		
AIC	0.026	0.030	0.058	12.454		
BIC	0.020	0.020	0.020	16.238		
CV.lse	0.020	0.019	0.018	2.504	0.013	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.017	0.015	0.015	2.349	0.011	
AICc	0.019	0.018	0.017	2.352		
AIC	<b>0.01</b>	<b>0.01</b>	0.017	2.342		
BIC	0.020	0.020	0.020	2.786		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	116.202	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	0.021	121.387	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	118.438		
AIC	0.291	0.430	0.972	146.789		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	121.842		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	41.750	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	43.030	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	42.506		
AIC	0.144	0.197	0.433	50.747		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	42.059		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.597	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.502	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.521		
AIC	0.049	0.065	0.150	7.602		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	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.lse	<b>0.01</b>	<b>0.01</b>	0.012	19.847	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	18.825	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	19.301		
AIC	0.022	0.027	0.048	18.624		
BIC	0.037	0.025	0.017	27.156		
CV.lse	0.016	0.013	0.011	9.114	0.011	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	8.028	<b>0.01</b>	
AICc	0.019	0.014	<b>0.01</b>	8.657		
AIC	0.011	0.013	0.022	7.574		
BIC	0.050	0.050	0.041	20.270		
CV.lse	0.019	0.015	0.012	2.705	0.012	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.011	<b>0.01</b>	<b>0.01</b>	2.387	0.011	
AICc	0.023	0.017	<b>0.01</b>	2.399		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.365		
BIC	0.050	0.050	0.050	3.283		
CV.lse	0.032	0.034	0.045	69.034	0.031	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.010
CV.min	<b>0.027</b>	0.029	0.039	68.319	<b>0.027</b>	
AICc	0.029	0.029	0.045	68.304		
AIC	0.123	0.164	0.346	73.648		
BIC	0.050	0.050	0.050	91.755		
CV.lse	0.049	0.048	0.050	27.976	0.046	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.010
CV.min	0.039	0.039	0.049	26.470	0.038	
AICc	0.041	0.037	<b>0.033</b>	27.003		
AIC	0.064	0.080	0.159	26.460		
BIC	0.050	0.050	0.050	33.302		
CV.lse	0.050	0.050	0.050	5.369	0.050	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	0.050	0.050	0.050	4.956	0.049	
AICc	0.050	0.050	0.050	4.924		
AIC	<b>0.029</b>	0.031	0.053	4.755		
BIC	0.050	0.050	0.050	5.466		
CV.lse	0.050	0.050	0.050	240.830	0.050	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.031
CV.min	0.046	0.050	0.050	250.983	0.046	
AICc	<b>0.045</b>	0.051	0.050	244.772		
AIC	0.627	1.030	2.309	305.325		
BIC	0.050	0.050	0.238	248.166		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	83.694	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.021
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	86.330	<b>0.05</b>	
AICc	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	85.272		
AIC	0.302	0.452	1.008	103.480		
BIC	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	83.993		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	14.287	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.021
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	14.208	<b>0.05</b>	
AICc	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	14.248		
AIC	0.122	0.175	0.399	14.525		
BIC	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	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.lse	0.041	0.045	0.065	46.053	0.039	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.020
CV.min	0.036	0.039	0.055	42.622	<b>0.035</b>	
AICc	0.047	0.044	0.052	45.755		
AIC	0.059	0.072	0.130	41.207		
BIC	0.100	0.100	0.074	114.308		
CV.lse	0.060	0.061	0.095	23.346	0.056	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.010
CV.min	0.041	0.042	0.086	19.498	0.041	
AICc	0.078	0.058	0.042	22.139		
AIC	<b>0.038</b>	0.042	0.066	16.298		
BIC	0.100	0.100	0.098	41.460		
CV.lse	0.086	0.086	0.100	6.322	0.093	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	0.064	0.066	0.099	5.325	0.078	
AICc	0.100	0.094	0.042	5.277		
AIC	0.037	<b>0.033</b>	0.037	4.532		
BIC	0.100	0.100	0.100	6.597		
CV.lse	0.083	0.095	0.100	148.986	0.082	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.044
CV.min	<b>0.07</b>	0.086	0.100	145.735	<b>0.07</b>	
AICc	0.076	0.080	0.124	147.233		
AIC	0.272	0.396	0.843	154.980		
BIC	0.100	0.100	0.150	197.277		
CV.lse	0.100	0.100	0.100	59.814	0.100	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.030
CV.min	0.097	0.099	0.100	55.908	0.097	
AICc	<b>0.096</b>	0.098	0.097	57.338		
AIC	0.145	0.193	0.387	54.755		
BIC	0.100	0.100	0.100	66.869		
CV.lse	0.100	0.100	0.100	10.892	0.100	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.029
CV.min	0.100	0.100	0.100	10.352	0.100	
AICc	0.100	0.100	0.100	10.271		
AIC	<b>0.075</b>	0.089	0.161	9.447		
BIC	0.100	0.100	0.100	10.781		
CV.lse	0.100	0.100	0.100	490.719	0.100	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.090
CV.min	<b>0.098</b>	0.101	0.101	511.451	<b>0.098</b>	
AICc	<b>0.098</b>	0.106	0.100	498.621		
AIC	1.303	2.403	5.214	623.452		
BIC	0.100	0.100	3.583	499.327		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	167.371	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.069
CV.min	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	172.579	<b>0.1</b>	
AICc	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	170.568		
AIC	0.613	1.017	2.251	208.452		
BIC	<b>0.1</b>	<b>0.1</b>	0.143	167.685		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	27.529	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.068
CV.min	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	27.546	<b>0.1</b>	
AICc	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	27.607		
AIC	0.278	0.439	0.979	28.306		
BIC	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	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.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.328	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.317	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.317		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.317		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.328		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.295	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.285	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.286		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.285		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.297		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.281	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.272	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.272		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.272		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.283		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.246	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.276	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.266		
AIC	0.010	0.010	0.013	1.313		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.267		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.118	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.146	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.135		
AIC	0.009	0.010	0.011	1.181		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.142		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.063	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.084	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.078		
AIC	0.008	0.009	0.010	1.114		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.086		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	4.898	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	5.206	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	5.082		
AIC	0.049	0.060	0.124	6.067		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	4.957		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	4.397	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	4.670	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	4.553		
AIC	0.044	0.053	0.106	5.446		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	4.461		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	4.172	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	4.403	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	4.312		
AIC	0.038	0.046	0.093	5.080		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	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.lse	<b>0</b>	<b>0</b>	<b>0</b>	2.042	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.974	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.981		
AIC	0.011	0.011	0.020	1.981		
BIC	0.007	0.002	0.001	2.289		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.853	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.786	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.795		
AIC	0.010	0.011	0.017	1.790		
BIC	0.008	0.003	<b>0</b>	2.120		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.762	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.693	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.704		
AIC	0.010	0.010	0.015	1.694		
BIC	0.008	0.003	<b>0</b>	2.016		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.012	7.615	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	7.637	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.017	7.579		
AIC	0.064	0.079	0.163	8.292		
BIC	0.017	0.014	0.017	8.587		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.011	6.857	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	6.868	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.014	6.823		
AIC	0.056	0.069	0.139	7.467		
BIC	0.018	0.015	0.017	7.855		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.011	6.509	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	6.486	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.013	6.456		
AIC	0.050	0.061	0.123	6.992		
BIC	0.019	0.016	0.017	7.492		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	28.325	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.012
CV.min	<b>0.02</b>	<b>0.02</b>	0.022	29.614	<b>0.02</b>	
AICc	<b>0.02</b>	0.022	0.041	28.920		
AIC	0.359	0.530	1.206	35.888		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	29.717		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	25.373	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.011
CV.min	<b>0.02</b>	<b>0.02</b>	0.021	26.519	<b>0.02</b>	
AICc	<b>0.02</b>	0.021	0.043	25.885		
AIC	0.313	0.454	1.013	32.212		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	26.501		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	24.000	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	0.021	24.954	<b>0.02</b>	
AICc	<b>0.02</b>	0.021	0.037	24.431		
AIC	0.276	0.399	0.889	30.063		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	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.lse	0.010	0.007	0.002	3.649	0.002	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.008	0.004	<b>0.001</b>	3.533	<b>0.001</b>	
AICc	0.009	0.004	0.002	3.552		
AIC	0.022	0.024	0.044	3.574		
BIC	0.010	0.010	0.006	4.076		
CV.lse	0.010	0.007	0.001	3.315	0.001	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.008	0.003	<b>0</b>	3.202	<b>0</b>	
AICc	0.010	0.003	0.002	3.227		
AIC	0.019	0.022	0.038	3.229		
BIC	0.011	0.010	0.004	3.784		
CV.lse	0.010	0.006	0.001	3.162	<b>0</b>	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.008	0.002	<b>0</b>	3.044	<b>0</b>	
AICc	0.009	0.003	0.001	3.070		
AIC	0.017	0.020	0.034	3.060		
BIC	0.011	0.010	0.004	3.628		
CV.lse	0.023	0.024	0.033	14.138	0.022	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.007
CV.min	<b>0.021</b>	<b>0.021</b>	0.028	14.068	<b>0.021</b>	
AICc	<b>0.021</b>	<b>0.021</b>	0.038	14.009		
AIC	0.126	0.166	0.354	15.342		
BIC	0.040	0.038	0.040	17.915		
CV.lse	0.024	0.024	0.032	12.775	0.022	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.004
CV.min	<b>0.02</b>	<b>0.02</b>	0.026	12.685	<b>0.02</b>	
AICc	0.021	<b>0.02</b>	0.033	12.655		
AIC	0.111	0.145	0.302	13.777		
BIC	0.040	0.039	0.040	16.729		
CV.lse	0.024	0.024	0.031	12.135	0.022	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.003
CV.min	<b>0.02</b>	<b>0.02</b>	0.025	11.995	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	0.031	11.980		
AIC	0.098	0.128	0.267	12.956		
BIC	0.040	0.039	0.040	16.045		
CV.lse	0.040	0.040	0.040	51.327	0.040	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.024
CV.min	0.040	0.041	0.042	53.535	0.040	
AICc	<b>0.039</b>	0.051	0.071	52.266		
AIC	0.669	1.078	2.446	65.105		
BIC	0.040	0.040	0.040	53.281		
CV.lse	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	45.907	<b>0.04</b>	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.021
CV.min	<b>0.04</b>	0.041	0.041	47.883	<b>0.04</b>	
AICc	<b>0.04</b>	0.047	0.073	46.753		
AIC	0.584	0.918	2.046	58.347		
BIC	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	47.401		
CV.lse	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	43.426	<b>0.04</b>	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.019
CV.min	<b>0.04</b>	<b>0.04</b>	0.041	45.137	<b>0.04</b>	
AICc	<b>0.04</b>	0.046	0.064	44.127		
AIC	0.511	0.804	1.800	54.507		
BIC	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	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.lse	0.010	0.010	0.002	5.285	<b>0.001</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.010	0.009	0.002	5.132	<b>0.001</b>	
AICc	0.010	0.009	0.004	5.157		
AIC	0.033	0.038	0.073	5.239		
BIC	0.014	0.010	0.007	5.743		
CV.lse	0.010	0.010	0.001	4.808	0.001	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.010	0.009	0.001	4.658	<b>0</b>	
AICc	0.010	0.010	0.002	4.688		
AIC	0.029	0.033	0.062	4.733		
BIC	0.015	0.010	0.005	5.306		
CV.lse	0.010	0.010	0.001	4.588	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.010	0.009	0.001	4.433	<b>0</b>	
AICc	0.010	0.009	0.002	4.466		
AIC	0.026	0.030	0.055	4.489		
BIC	0.015	0.010	0.005	5.083		
CV.lse	0.038	0.041	0.056	21.085	0.036	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.010
CV.min	<b>0.031</b>	0.033	0.050	20.917	<b>0.031</b>	
AICc	0.032	0.033	0.063	20.861		
AIC	0.193	0.267	0.579	22.850		
BIC	0.060	0.059	0.060	28.864		
CV.lse	0.039	0.040	0.055	19.070	0.037	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.010
CV.min	<b>0.031</b>	0.032	0.047	18.874	<b>0.031</b>	
AICc	0.033	0.032	0.055	18.858		
AIC	0.170	0.232	0.491	20.495		
BIC	0.060	0.060	0.060	26.477		
CV.lse	0.038	0.040	0.054	18.124	0.036	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	<b>0.031</b>	<b>0.031</b>	0.046	17.859	<b>0.031</b>	
AICc	0.033	<b>0.031</b>	0.050	17.873		
AIC	0.150	0.203	0.432	19.273		
BIC	0.060	0.060	0.060	25.202		
CV.lse	0.060	0.060	0.060	75.904	0.060	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.035
CV.min	<b>0.059</b>	0.062	0.062	79.163	<b>0.059</b>	
AICc	<b>0.059</b>	0.086	0.090	77.225		
AIC	0.997	1.708	3.825	96.438		
BIC	0.060	0.060	0.060	78.420		
CV.lse	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	67.803	<b>0.06</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.030
CV.min	<b>0.06</b>	0.061	0.062	70.692	<b>0.06</b>	
AICc	<b>0.06</b>	0.079	0.092	68.967		
AIC	0.871	1.455	3.226	86.201		
BIC	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	69.642		
CV.lse	0.060	0.060	0.060	64.208	0.060	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.027
CV.min	0.060	0.061	0.061	66.746	0.060	
AICc	<b>0.059</b>	0.076	0.087	65.228		
AIC	0.761	1.270	2.828	80.641		
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.lse	0	0	0	1.314	0	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0	0	0	1.272	0	
AICc	0	0	0	1.273		
AIC	0	0	0	1.272		
BIC	0	0	0	1.318		
CV.lse	0	0	0	0.610	0	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0	0	0	0.586	0	
AICc	0	0	0	0.587		
AIC	0	0	0	0.586		
BIC	0	0	0	0.606		
CV.lse	0	0	0	0.174	0	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0	0	0	0.167	0	
AICc	0	0	0	0.167		
AIC	0	0	0	0.167		
BIC	0	0	0	0.167		
CV.lse	0	0	0	5.004	0	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0	0	0	5.133	0	
AICc	0	0	0	5.083		
AIC	0.010	0.010	0.010	5.277		
BIC	0	0	0	5.094		
CV.lse	0	0	0	2.083	0	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0	0	0	2.069	0	
AICc	0	0	0	2.064		
AIC	0	0	0.001	2.074		
BIC	0	0	0	2.230		
CV.lse	0	0	0	0.544	0	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0	0	0	0.523	0	
AICc	0	0	0	0.523		
AIC	0	0	0	0.523		
BIC	0	0	0	0.537		
CV.lse	0	0	0	19.703	0	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0	0	0	20.924	0	
AICc	0	0	0	20.419		
AIC	0.040	0.048	0.099	24.311		
BIC	0	0	0	19.918		
CV.lse	0	0	0	7.936	0	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0	0	0	8.190	0	
AICc	0	0	0	8.099		
AIC	0.019	0.021	0.042	8.896		
BIC	0	0	0	8.117		
CV.lse	0	0	0	2.049	0	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0	0	0	2.022	0	
AICc	0	0	0	2.025		
AIC	0.009	0.010	0.019	2.033		
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.lse	<b>0</b>	<b>0</b>	<b>0</b>	8.189	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	7.919	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	7.948		
AIC	0.010	0.010	0.016	7.945		
BIC	0.006	0.002	0.002	9.162		
CV.lse	0.002	<b>0</b>	<b>0</b>	3.630	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	3.381	<b>0</b>	
AICc	0.002	<b>0</b>	<b>0</b>	3.442		
AIC	0.001	0.001	0.009	3.355		
BIC	0.015	0.010	0.003	5.182		
CV.lse	0.006	0.002	<b>0</b>	1.143	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.075	<b>0</b>	
AICc	0.007	0.002	<b>0</b>	1.076		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	1.076		
BIC	0.020	0.020	0.019	1.215		
CV.lse	<b>0.01</b>	<b>0.01</b>	0.011	30.539	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	30.640	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.011	30.396		
AIC	0.051	0.063	0.129	33.232		
BIC	0.017	0.016	0.020	34.514		
CV.lse	0.016	0.013	0.013	12.367	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	11.947	<b>0.01</b>	
AICc	0.011	<b>0.01</b>	<b>0.01</b>	12.032		
AIC	0.025	0.029	0.057	12.162		
BIC	0.020	0.020	0.020	15.925		
CV.lse	0.020	0.018	0.017	2.460	0.012	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.017	0.014	0.014	2.310	0.011	
AICc	0.019	0.017	0.016	2.312		
AIC	<b>0.01</b>	<b>0.01</b>	0.016	2.303		
BIC	0.020	0.020	0.020	2.746		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	113.819	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.010
CV.min	<b>0.02</b>	<b>0.02</b>	0.021	118.880	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	116.011		
AIC	0.285	0.420	0.948	143.937		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	119.474		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	40.987	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.009
CV.min	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	42.254	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	41.712		
AIC	0.141	0.192	0.422	49.755		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	41.303		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.500	<b>0.02</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.009
CV.min	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.406	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.422		
AIC	0.048	0.063	0.147	7.504		
BIC	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	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.lse	0.010	0.005	0.001	14.641	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.007	0.001	<b>0</b>	14.173	<b>0</b>	
AICc	0.009	0.002	<b>0</b>	14.250		
AIC	0.018	0.020	0.035	14.326		
BIC	0.010	0.010	0.005	16.271		
CV.lse	0.010	0.007	<b>0</b>	6.671	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.008	0.001	<b>0</b>	6.102	<b>0</b>	
AICc	0.010	0.007	<b>0</b>	6.348		
AIC	0.010	0.010	0.015	5.976		
BIC	0.040	0.039	0.004	16.698		
CV.lse	0.010	0.009	0.001	2.237	0.001	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.010	0.003	<b>0</b>	2.013	<b>0</b>	
AICc	0.010	0.010	<b>0</b>	2.022		
AIC	0.010	0.002	<b>0</b>	2.010		
BIC	0.040	0.040	0.040	2.821		
CV.lse	0.022	0.023	0.030	56.693	0.021	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.004
CV.min	<b>0.02</b>	<b>0.02</b>	0.024	56.464	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	0.027	56.219		
AIC	0.101	0.133	0.281	61.526		
BIC	0.040	0.040	0.040	71.760		
CV.lse	0.037	0.033	0.038	23.253	0.028	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.025	0.023	0.034	22.171	0.022	
AICc	0.030	0.024	<b>0.02</b>	22.503		
AIC	0.052	0.064	0.128	22.379		
BIC	0.040	0.040	0.040	28.805		
CV.lse	0.040	0.040	0.040	4.611	0.038	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.040	0.038	0.040	4.251	0.033	
AICc	0.040	0.040	0.039	4.227		
AIC	<b>0.02</b>	0.021	0.039	4.113		
BIC	0.040	0.040	0.040	4.810		
CV.lse	0.040	0.040	0.040	206.405	0.040	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.020
CV.min	0.039	0.040	0.041	215.140	0.039	
AICc	<b>0.038</b>	0.041	0.041	209.877		
AIC	0.533	0.854	1.927	261.313		
BIC	0.040	0.040	0.077	214.307		
CV.lse	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	72.558	<b>0.04</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.010
CV.min	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	74.881	<b>0.04</b>	
AICc	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	73.917		
AIC	0.259	0.381	0.851	89.410		
BIC	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	72.874		
CV.lse	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	12.668	<b>0.04</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.010
CV.min	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	12.572	<b>0.04</b>	
AICc	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	12.607		
AIC	0.102	0.144	0.330	12.810		
BIC	<b>0.04</b>	<b>0.04</b>	<b>0.04</b>	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.lse	0.010	0.010	0.001	21.213	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.010	0.009	<b>0</b>	20.593	<b>0</b>	
AICc	0.010	0.009	0.002	20.694		
AIC	0.027	0.031	0.058	21.019		
BIC	0.013	0.010	0.006	23.085		
CV.lse	0.010	0.010	<b>0</b>	9.770	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.010	0.008	<b>0</b>	8.912	<b>0</b>	
AICc	0.011	0.010	<b>0</b>	9.342		
AIC	0.012	0.014	0.025	8.684		
BIC	0.060	0.056	0.001	25.915		
CV.lse	0.011	0.010	<b>0</b>	3.342	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.010	0.008	<b>0</b>	2.877	<b>0</b>	
AICc	0.014	0.010	<b>0</b>	2.898		
AIC	0.010	0.008	0.008	2.843		
BIC	0.060	0.060	0.044	4.207		
CV.lse	0.035	0.038	0.052	84.516	0.033	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.010
CV.min	<b>0.029</b>	0.030	0.043	83.894	<b>0.029</b>	
AICc	0.030	0.030	0.046	83.679		
AIC	0.155	0.214	0.460	91.688		
BIC	0.060	0.060	0.060	116.109		
CV.lse	0.058	0.056	0.060	35.001	0.054	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.001
CV.min	0.044	0.043	0.059	33.181	0.042	
AICc	0.051	0.040	<b>0.033</b>	33.805		
AIC	0.081	0.103	0.211	33.234		
BIC	0.060	0.060	0.060	42.426		
CV.lse	0.060	0.060	0.060	6.958	0.060	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.001
CV.min	0.060	0.060	0.060	6.412	0.059	
AICc	0.060	0.060	0.059	6.353		
AIC	<b>0.034</b>	0.037	0.070	5.966		
BIC	0.060	0.060	0.060	7.008		
CV.lse	0.060	0.060	0.060	304.998	0.060	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.028
CV.min	0.058	0.061	0.062	317.792	0.058	
AICc	<b>0.057</b>	0.063	0.060	309.999		
AIC	0.794	1.354	3.025	386.824		
BIC	0.060	0.060	0.633	315.022		
CV.lse	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	106.431	<b>0.06</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.016
CV.min	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	109.886	<b>0.06</b>	
AICc	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	108.443		
AIC	0.384	0.595	1.331	131.600		
BIC	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	106.781		
CV.lse	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	18.284	<b>0.06</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.016
CV.min	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	18.183	<b>0.06</b>	
AICc	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	18.231		
AIC	0.163	0.243	0.557	18.642		
BIC	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	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.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.526	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.504	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.003	0.557		
AIC	<b>0</b>	0.001	0.003	0.523		
BIC	<b>0</b>	0.001	0.003	0.530		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.485	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.458	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	0.520		
AIC	<b>0</b>	<b>0</b>	0.003	0.471		
BIC	<b>0</b>	<b>0</b>	0.003	0.478		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.472	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.438	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	0.505		
AIC	<b>0</b>	0.001	0.002	0.449		
BIC	<b>0</b>	0.001	0.002	0.457		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.794	<b>0</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	2.032	0.001	
AICc	<b>0</b>	0.003	0.012	1.729		
AIC	0.009	0.010	0.012	2.151		
BIC	0.009	0.010	0.012	2.148		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.635	<b>0</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	0.001	0.001	1.831	0.001	
AICc	<b>0</b>	0.002	0.011	1.573		
AIC	0.008	0.010	0.011	1.930		
BIC	0.008	0.010	0.011	1.927		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.545	<b>0</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	1.724	0.001	
AICc	<b>0</b>	0.001	0.011	1.501		
AIC	0.009	0.010	0.011	1.828		
BIC	0.009	0.010	0.011	1.824		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	6.910	<b>0</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.002
CV.min	0.002	0.002	0.001	8.222	0.003	
AICc	0.003	0.014	0.035	6.009		
AIC	0.014	0.023	0.036	8.741		
BIC	0.014	0.023	0.036	8.737		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	6.196	<b>0</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.002
CV.min	0.002	0.002	0.001	7.376	0.003	
AICc	0.003	0.012	0.032	5.391		
AIC	0.013	0.021	0.032	7.792		
BIC	0.013	0.021	0.032	7.788		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	5.855	<b>0</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.001
CV.min	0.002	0.002	0.001	6.969	0.003	
AICc	0.003	0.011	0.031	5.154		
AIC	0.013	0.020	0.031	7.417		
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.lse	<b>0.02</b>	0.021	0.021	3.271	0.021	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.026
CV.min	0.022	0.023	0.022	2.949	0.024	
AICc	0.022	0.037	0.059	4.316		
AIC	0.032	0.042	0.059	2.944		
BIC	0.032	0.042	0.059	2.943		
CV.lse	<b>0.02</b>	0.021	0.021	2.960	0.021	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.022
CV.min	0.022	0.022	0.022	2.638	0.023	
AICc	0.022	0.035	0.055	3.860		
AIC	0.032	0.041	0.055	2.633		
BIC	0.032	0.041	0.055	2.632		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	2.894	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.021
CV.min	0.022	0.022	0.022	2.504	0.023	
AICc	0.021	0.033	0.054	3.772		
AIC	0.032	0.039	0.054	2.486		
BIC	0.032	0.039	0.054	2.487		
CV.lse	<b>0.021</b>	<b>0.021</b>	<b>0.021</b>	10.258	<b>0.021</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.031
CV.min	0.024	0.023	0.022	11.337	0.024	
AICc	0.024	0.057	0.092	10.122		
AIC	0.043	0.064	0.092	11.795		
BIC	0.043	0.064	0.092	11.790		
CV.lse	<b>0.021</b>	<b>0.021</b>	<b>0.021</b>	9.188	<b>0.021</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.029
CV.min	0.024	0.023	0.022	10.122	0.024	
AICc	0.024	0.053	0.085	9.087		
AIC	0.042	0.060	0.085	10.520		
BIC	0.042	0.060	0.085	10.516		
CV.lse	<b>0.021</b>	<b>0.021</b>	<b>0.021</b>	8.725	<b>0.021</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.026
CV.min	0.023	0.022	0.022	9.513	0.024	
AICc	0.023	0.050	0.079	8.655		
AIC	0.041	0.057	0.079	9.933		
BIC	0.041	0.057	0.079	9.929		
CV.lse	<b>0.022</b>	<b>0.022</b>	0.023	37.726	0.023	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.039
CV.min	0.026	0.025	0.025	44.850	0.027	
AICc	0.027	0.144	0.217	32.632		
AIC	0.084	0.153	0.217	47.153		
BIC	0.084	0.153	0.217	47.137		
CV.lse	<b>0.022</b>	<b>0.022</b>	<b>0.022</b>	33.791	<b>0.022</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.037
CV.min	0.026	0.024	0.024	39.934	0.026	
AICc	0.026	0.131	0.196	29.173		
AIC	0.078	0.140	0.196	42.191		
BIC	0.078	0.140	0.196	42.173		
CV.lse	<b>0.022</b>	<b>0.022</b>	<b>0.022</b>	31.349	<b>0.022</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.034
CV.min	0.026	0.024	0.024	37.309	0.027	
AICc	0.026	0.122	0.188	27.516		
AIC	0.077	0.131	0.188	39.711		
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.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	6.717	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 296.861
CV.min	0.051	0.052	0.051	6.017	0.052	
AICc	<b>0.05</b>	0.091	0.130	9.026		
AIC	0.068	0.096	0.130	5.986		
BIC	0.068	0.096	0.130	5.984		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	6.066	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 6.607
CV.min	0.051	0.051	0.051	5.381	0.052	
AICc	<b>0.05</b>	0.084	0.121	8.156		
AIC	0.067	0.090	0.121	5.337		
BIC	0.067	0.090	0.121	5.335		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	5.905	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 8.065
CV.min	0.051	0.051	0.051	5.100	0.052	
AICc	<b>0.05</b>	0.082	0.116	7.866		
AIC	0.066	0.088	0.116	5.030		
BIC	0.066	0.088	0.116	5.029		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	20.893	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.122
CV.min	0.052	0.052	0.052	22.993	0.053	
AICc	0.051	0.133	0.194	20.644		
AIC	0.088	0.141	0.194	23.877		
BIC	0.088	0.141	0.194	23.868		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	18.668	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.100
CV.min	0.052	0.052	0.051	20.455	0.053	
AICc	0.051	0.124	0.180	18.486		
AIC	0.086	0.131	0.181	21.260		
BIC	0.086	0.131	0.181	21.249		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	17.702	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.099
CV.min	0.052	0.052	0.052	19.251	0.053	
AICc	0.051	0.118	0.168	17.562		
AIC	0.084	0.126	0.168	20.094		
BIC	0.084	0.126	0.168	20.083		
CV.lse	<b>0.05</b>	<b>0.05</b>	0.051	76.347	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.080
CV.min	0.055	0.054	0.054	90.392	0.057	
AICc	0.054	0.322	0.461	66.067		
AIC	0.170	0.334	0.462	95.261		
BIC	0.170	0.334	0.462	95.227		
CV.lse	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	68.388	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.078
CV.min	0.054	0.054	0.053	80.836	0.056	
AICc	0.054	0.288	0.411	58.981		
AIC	0.158	0.299	0.412	85.029		
BIC	0.158	0.299	0.412	84.994		
CV.lse	<b>0.05</b>	<b>0.05</b>	0.051	63.175	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.073
CV.min	0.055	0.054	0.054	75.478	0.056	
AICc	0.054	0.271	0.391	55.779		
AIC	0.155	0.283	0.392	80.331		
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.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	13.601	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 3349.772
CV.min	0.103	0.103	0.103	12.016	0.105	
AICc	0.101	0.199	0.273	18.227		
AIC	0.140	0.205	0.273	11.966		
BIC	0.140	0.205	0.273	11.962		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	12.342	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 1995.095
CV.min	0.102	0.102	0.102	10.791	0.103	
AICc	0.101	0.188	0.257	16.688		
AIC	0.138	0.195	0.258	10.703		
BIC	0.138	0.195	0.258	10.700		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	11.951	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 353.306
CV.min	0.102	0.102	0.102	10.239	0.103	
AICc	0.101	0.182	0.241	15.861		
AIC	0.136	0.188	0.242	10.121		
BIC	0.136	0.188	0.242	10.119		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	42.180	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 1.151
CV.min	0.105	0.104	0.104	46.230	0.106	
AICc	0.103	0.294	0.404	41.661		
AIC	0.180	0.303	0.404	47.906		
BIC	0.180	0.303	0.404	47.889		
CV.lse	<b>0.1</b>	<b>0.1</b>	0.101	37.519	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.666
CV.min	0.104	0.104	0.103	41.164	0.106	
AICc	0.103	0.275	0.375	37.226		
AIC	0.175	0.283	0.375	42.685		
BIC	0.175	0.283	0.375	42.673		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	35.715	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.941
CV.min	0.104	0.104	0.103	38.820	0.106	
AICc	0.103	0.259	0.355	35.322		
AIC	0.172	0.268	0.355	40.488		
BIC	0.172	0.268	0.355	40.475		
CV.lse	<b>0.101</b>	<b>0.101</b>	<b>0.101</b>	154.796	<b>0.101</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.159
CV.min	0.111	0.108	0.109	182.987	0.115	
AICc	0.110	0.716	0.957	133.295		
AIC	0.342	0.728	0.957	192.590		
BIC	0.341	0.728	0.957	192.499		
CV.lse	<b>0.101</b>	<b>0.101</b>	<b>0.101</b>	136.826	<b>0.101</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.156
CV.min	0.109	0.108	0.107	162.564	0.114	
AICc	0.109	0.638	0.846	118.647		
AIC	0.320	0.652	0.846	171.265		
BIC	0.320	0.652	0.846	171.200		
CV.lse	<b>0.101</b>	<b>0.101</b>	<b>0.101</b>	127.348	<b>0.101</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.147
CV.min	0.110	0.108	0.107	151.934	0.114	
AICc	0.109	0.596	0.799	112.301		
AIC	0.316	0.611	0.799	161.486		
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.lse	<b>0</b>	<b>0</b>	<b>0</b>	2.108	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	2.030	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	2.237		
AIC	<b>0</b>	<b>0</b>	0.002	2.101		
BIC	<b>0</b>	<b>0</b>	0.002	2.146		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.037	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.843	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.002	1.166		
AIC	<b>0</b>	<b>0</b>	0.002	0.814		
BIC	<b>0</b>	<b>0</b>	0.002	0.907		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.289	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.222	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.247		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.199		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.316		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	7.245	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	0.001	0.001	8.172	0.001	
AICc	<b>0</b>	<b>0</b>	0.010	6.939		
AIC	0.008	0.010	0.010	8.655		
BIC	0.008	0.010	0.010	8.634		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	2.827	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	3.070	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.009	2.782		
AIC	0.006	0.008	0.010	3.273		
BIC	0.006	0.008	0.010	3.264		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.717	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.696	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.682		
AIC	<b>0</b>	0.001	0.004	0.805		
BIC	<b>0</b>	0.001	0.004	0.700		
CV.lse	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	27.723	<b>0.001</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.001
CV.min	0.003	0.002	0.002	33.054	0.003	
AICc	0.003	0.005	0.031	24.010		
AIC	0.012	0.020	0.031	35.085		
BIC	0.012	0.020	0.031	35.070		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	10.083	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	12.084	0.001	
AICc	0.001	<b>0</b>	0.013	9.107		
AIC	0.010	0.010	0.013	13.175		
BIC	0.010	0.010	0.013	13.156		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	2.291	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.001
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	2.528	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.006	2.341		
AIC	0.010	0.010	0.010	3.436		
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.lse	<b>0.022</b>	<b>0.022</b>	<b>0.022</b>	13.270	<b>0.022</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.021
CV.min	0.023	0.023	0.023	11.890	0.023	
AICc	<b>0.022</b>	0.028	0.052	17.111		
AIC	0.030	0.039	0.052	11.862		
BIC	0.030	0.039	0.052	11.857		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	5.378	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.014
CV.min	0.021	0.021	0.021	4.240	0.021	
AICc	0.021	0.021	0.034	6.623		
AIC	0.030	0.030	0.034	4.065		
BIC	0.030	0.030	0.034	4.064		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	1.542	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.013
CV.min	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	1.121	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	0.024	1.262		
AIC	0.023	0.026	0.029	0.737		
BIC	0.023	0.026	0.029	1.378		
CV.lse	<b>0.023</b>	<b>0.023</b>	<b>0.023</b>	41.467	<b>0.023</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.027
CV.min	0.025	0.025	0.024	45.677	0.026	
AICc	0.025	0.042	0.080	40.704		
AIC	0.039	0.057	0.080	47.412		
BIC	0.039	0.057	0.080	47.393		
CV.lse	<b>0.021</b>	<b>0.021</b>	<b>0.021</b>	14.363	<b>0.021</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.019
CV.min	0.022	0.022	<b>0.021</b>	15.423	0.022	
AICc	0.022	0.022	0.043	14.342		
AIC	0.030	0.035	0.043	16.291		
BIC	0.030	0.035	0.043	16.279		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	2.822	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.019
CV.min	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	2.616	<b>0.02</b>	
AICc	<b>0.02</b>	<b>0.02</b>	0.028	2.648		
AIC	0.029	0.030	0.030	2.884		
BIC	0.029	0.030	0.030	2.875		
CV.lse	<b>0.025</b>	<b>0.025</b>	0.026	151.728	0.026	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.037
CV.min	0.028	0.027	0.027	180.429	0.029	
AICc	0.028	0.121	0.188	131.418		
AIC	0.074	0.134	0.188	190.125		
BIC	0.074	0.133	0.188	190.049		
CV.lse	<b>0.023</b>	<b>0.023</b>	<b>0.023</b>	49.491	<b>0.023</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.027
CV.min	0.025	0.024	<b>0.023</b>	59.331	0.025	
AICc	0.025	0.038	0.080	44.999		
AIC	0.042	0.059	0.080	64.967		
BIC	0.042	0.059	0.080	64.933		
CV.lse	<b>0.02</b>	<b>0.02</b>	<b>0.02</b>	7.840	<b>0.02</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.025
CV.min	0.021	0.021	0.021	8.639	0.021	
AICc	0.021	<b>0.02</b>	0.039	8.095		
AIC	0.030	0.033	0.039	11.561		
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	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	27.338	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 26.263
CV.min	0.051	0.051	0.051	24.187	0.052	
AICc	<b>0.05</b>	0.075	0.114	36.340		
AIC	0.063	0.087	0.114	24.103		
BIC	0.063	0.087	0.114	24.111		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	10.857	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 15.203
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	8.558	<b>0.05</b>	
AICc	<b>0.05</b>	0.051	0.072	13.377		
AIC	0.055	0.061	0.072	8.167		
BIC	0.055	0.061	0.072	8.199		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	3.000	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 12.752
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	2.161	<b>0.05</b>	
AICc	<b>0.05</b>	<b>0.05</b>	0.052	2.478		
AIC	<b>0.05</b>	<b>0.05</b>	0.053	1.378		
BIC	<b>0.05</b>	<b>0.05</b>	0.053	2.305		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	84.513	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.102
CV.min	0.052	0.052	0.052	92.563	0.052	
AICc	0.051	0.115	0.170	83.668		
AIC	0.081	0.126	0.171	96.284		
BIC	0.081	0.126	0.171	96.246		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	28.764	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.067
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	30.846	<b>0.05</b>	
AICc	<b>0.05</b>	0.057	0.091	28.843		
AIC	0.061	0.074	0.091	32.569		
BIC	0.061	0.074	0.091	32.544		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	5.390	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.059
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	4.976	<b>0.05</b>	
AICc	<b>0.05</b>	<b>0.05</b>	0.059	5.058		
AIC	0.051	0.054	0.059	5.416		
BIC	0.051	0.054	0.059	5.438		
CV.1se	<b>0.052</b>	<b>0.052</b>	<b>0.052</b>	308.050	<b>0.052</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.077
CV.min	0.056	0.056	0.056	365.357	0.058	
AICc	0.055	0.279	0.393	267.155		
AIC	0.151	0.290	0.394	385.780		
BIC	0.151	0.290	0.394	385.622		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	99.072	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.061
CV.min	0.051	0.051	0.051	119.313	0.052	
AICc	0.051	0.107	0.166	90.468		
AIC	0.086	0.126	0.167	130.265		
BIC	0.086	0.126	0.167	130.194		
CV.1se	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	14.671	<b>0.05</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.059
CV.min	<b>0.05</b>	<b>0.05</b>	<b>0.05</b>	16.235	<b>0.05</b>	
AICc	<b>0.05</b>	<b>0.05</b>	0.078	15.168		
AIC	0.061	0.068	0.079	21.678		
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.lse	<b>0.1</b>	0.101	0.101	55.658	0.101	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 1253.554
CV.min	0.103	0.103	0.102	48.708	0.104	
AICc	0.101	0.178	0.240	74.225		
AIC	0.131	0.187	0.240	48.499		
BIC	0.131	0.187	0.240	48.485		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	21.955	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 708.345
CV.min	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	17.187	<b>0.1</b>	
AICc	<b>0.1</b>	0.111	0.148	26.781		
AIC	0.111	0.127	0.148	16.350		
BIC	0.111	0.127	0.148	16.344		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	5.936	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 601.732
CV.min	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	4.261	<b>0.1</b>	
AICc	<b>0.1</b>	<b>0.1</b>	0.109	4.934		
AIC	<b>0.1</b>	0.105	0.110	2.671		
BIC	<b>0.1</b>	0.105	0.110	4.183		
CV.lse	<b>0.101</b>	0.102	0.102	170.765	<b>0.101</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 21.631
CV.min	0.105	0.104	0.104	186.404	0.107	
AICc	0.103	0.261	0.355	168.740		
AIC	0.166	0.269	0.356	193.942		
BIC	0.166	0.269	0.356	193.872		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	57.518	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 13.382
CV.min	0.101	0.101	0.101	61.288	0.101	
AICc	<b>0.1</b>	0.135	0.186	57.517		
AIC	0.123	0.153	0.186	64.989		
BIC	0.123	0.153	0.186	64.960		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	10.467	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 13.438
CV.min	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	9.667	<b>0.1</b>	
AICc	<b>0.1</b>	<b>0.1</b>	0.119	9.840		
AIC	0.106	0.111	0.119	10.478		
BIC	0.106	0.111	0.119	10.572		
CV.lse	<b>0.104</b>	0.105	0.105	621.359	<b>0.104</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.153
CV.min	0.113	0.110	0.112	736.801	0.117	
AICc	0.112	0.608	0.803	536.105		
AIC	0.304	0.620	0.808	776.534		
BIC	0.304	0.620	0.808	776.223		
CV.lse	<b>0.101</b>	<b>0.101</b>	<b>0.101</b>	197.909	<b>0.101</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.124
CV.min	0.103	0.103	0.103	237.902	0.104	
AICc	0.103	0.251	0.344	181.025		
AIC	0.173	0.265	0.345	260.223		
BIC	0.173	0.265	0.345	260.073		
CV.lse	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	28.220	<b>0.1</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.120
CV.min	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>	31.225	<b>0.1</b>	
AICc	<b>0.1</b>	0.101	0.158	29.239		
AIC	0.121	0.139	0.159	41.667		
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.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.403	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.410	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.404		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.441		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.438		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.375	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.376	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.385		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.398		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.401		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.364	<b>0</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.359	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.377		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.379		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.384		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.524	<b>0</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	0.001	1.742	<b>0</b>	
AICc	<b>0</b>	0.001	0.010	1.450		
AIC	0.004	0.007	0.010	1.860		
BIC	0.004	0.007	0.010	1.855		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.389	<b>0</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.572	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.010	1.323		
AIC	0.004	0.007	0.010	1.663		
BIC	0.004	0.007	0.010	1.660		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.316	<b>0</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.479	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.010	1.265		
AIC	0.003	0.006	0.010	1.579		
BIC	0.003	0.006	0.010	1.576		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	5.985	<b>0</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	7.110	0.002	
AICc	0.001	0.010	0.030	5.194		
AIC	0.012	0.019	0.031	7.571		
BIC	0.012	0.019	0.031	7.567		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	5.375	<b>0</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	6.395	0.001	
AICc	0.001	0.009	0.027	4.662		
AIC	0.011	0.017	0.027	6.772		
BIC	0.011	0.017	0.027	6.765		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	5.029	<b>0</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	6.006	0.001	
AICc	0.001	0.008	0.026	4.423		
AIC	0.011	0.016	0.026	6.407		
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.lse	0.005	0.004	0.008	0.841	0.003	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.001</b>	<b>0.001</b>	0.006	0.863	<b>0.001</b>	
AICc	0.002	<b>0.001</b>	0.003	0.862		
AIC	0.002	0.002	0.003	0.927		
BIC	0.002	0.002	0.003	0.922		
CV.lse	0.007	0.006	0.009	0.790	0.005	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.003	0.002	0.007	0.793	0.002	
AICc	0.004	<b>0.001</b>	0.003	0.827		
AIC	0.003	0.002	0.003	0.837		
BIC	0.003	0.002	0.003	0.836		
CV.lse	0.008	0.006	0.009	0.762	0.005	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.003	0.003	0.007	0.755	0.003	
AICc	0.005	<b>0.002</b>	0.004	0.815		
AIC	0.003	<b>0.002</b>	0.004	0.791		
BIC	0.003	<b>0.002</b>	0.004	0.791		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.217	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.664	<b>0.01</b>	
AICc	<b>0.01</b>	0.011	0.023	3.088		
AIC	0.011	0.014	0.023	3.868		
BIC	0.011	0.014	0.023	3.862		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.928	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.296	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.021	2.816		
AIC	0.011	0.014	0.022	3.462		
BIC	0.011	0.014	0.022	3.459		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.773	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.084	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.021	2.682		
AIC	0.011	0.013	0.021	3.265		
BIC	0.011	0.013	0.021	3.261		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	12.422	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.003
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	14.796	0.011	
AICc	<b>0.01</b>	0.036	0.068	10.768		
AIC	0.027	0.044	0.068	15.664		
BIC	0.027	0.044	0.068	15.651		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	11.124	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.003
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	13.209	0.011	
AICc	<b>0.01</b>	0.032	0.060	9.630		
AIC	0.025	0.039	0.060	13.966		
BIC	0.025	0.039	0.060	13.954		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	10.449	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.002
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	12.416	<b>0.01</b>	
AICc	<b>0.01</b>	0.030	0.057	9.146		
AIC	0.025	0.038	0.057	13.205		
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.lse	0.007	0.005	0.009	0.934	0.004	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.002	0.002	0.007	0.959	0.002	
AICc	0.003	<b>0.001</b>	0.004	0.959		
AIC	0.003	0.002	0.004	1.031		
BIC	0.003	0.002	0.004	1.025		
CV.lse	0.008	0.007	0.009	0.874	0.005	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.004	0.003	0.007	0.879	0.003	
AICc	0.005	<b>0.002</b>	0.004	0.917		
AIC	0.004	<b>0.002</b>	0.004	0.928		
BIC	0.004	<b>0.002</b>	0.004	0.928		
CV.lse	0.009	0.007	0.009	0.849	0.006	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.005	0.004	0.008	0.840	0.004	
AICc	0.006	<b>0.002</b>	0.005	0.903		
AIC	0.005	0.003	0.005	0.881		
BIC	0.005	0.003	0.005	0.880		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.578	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	4.070	<b>0.01</b>	
AICc	<b>0.01</b>	0.012	0.025	3.438		
AIC	0.011	0.016	0.026	4.298		
BIC	0.011	0.016	0.026	4.294		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.253	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.657	<b>0.01</b>	
AICc	<b>0.01</b>	0.011	0.024	3.134		
AIC	0.011	0.016	0.024	3.843		
BIC	0.011	0.016	0.024	3.840		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.086	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.431	<b>0.01</b>	
AICc	<b>0.01</b>	0.011	0.023	2.981		
AIC	0.011	0.015	0.023	3.630		
BIC	0.011	0.015	0.023	3.626		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	13.819	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.004
CV.min	<b>0.01</b>	0.011	0.011	16.457	0.011	
AICc	<b>0.01</b>	0.042	0.075	11.988		
AIC	0.030	0.049	0.075	17.413		
BIC	0.030	0.049	0.075	17.404		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	12.374	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.003
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	14.684	0.011	
AICc	<b>0.01</b>	0.037	0.067	10.713		
AIC	0.027	0.044	0.067	15.531		
BIC	0.027	0.044	0.067	15.519		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	11.623	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.003
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	13.816	0.011	
AICc	<b>0.01</b>	0.035	0.064	10.184		
AIC	0.027	0.043	0.064	14.704		
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.lse	0.007	0.006	0.009	0.985	0.004	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.003	0.002	0.007	1.011	0.002	
AICc	0.004	<b>0.001</b>	0.004	1.011		
AIC	0.004	0.002	0.005	1.087		
BIC	0.004	0.002	0.005	1.081		
CV.lse	0.008	0.007	0.009	0.925	0.005	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.004	0.003	0.007	0.931	0.003	
AICc	0.006	<b>0.002</b>	0.004	0.968		
AIC	0.005	<b>0.002</b>	0.004	0.982		
BIC	0.005	<b>0.002</b>	0.004	0.982		
CV.lse	0.009	0.007	0.010	0.892	0.006	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	0.005	0.004	0.008	0.885	0.004	
AICc	0.007	<b>0.003</b>	0.005	0.952		
AIC	0.005	<b>0.003</b>	0.005	0.928		
BIC	0.005	<b>0.003</b>	0.005	0.928		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.769	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	4.292	<b>0.01</b>	
AICc	<b>0.01</b>	0.013	0.027	3.627		
AIC	0.012	0.018	0.027	4.532		
BIC	0.012	0.018	0.027	4.527		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.440	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.871	<b>0.01</b>	
AICc	<b>0.01</b>	0.012	0.025	3.309		
AIC	0.012	0.017	0.026	4.065		
BIC	0.012	0.017	0.026	4.062		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.262	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.629	<b>0.01</b>	
AICc	<b>0.01</b>	0.012	0.024	3.148		
AIC	0.012	0.016	0.024	3.837		
BIC	0.012	0.016	0.024	3.834		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	14.577	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.005
CV.min	0.011	0.011	0.011	17.364	0.011	
AICc	<b>0.01</b>	0.044	0.079	12.631		
AIC	0.032	0.052	0.080	18.385		
BIC	0.032	0.052	0.080	18.376		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	13.056	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.004
CV.min	0.011	0.011	0.011	15.485	0.011	
AICc	<b>0.01</b>	0.039	0.072	11.270		
AIC	0.029	0.046	0.072	16.380		
BIC	0.029	0.046	0.072	16.367		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	12.206	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.003
CV.min	0.011	0.011	0.011	14.533	0.011	
AICc	<b>0.01</b>	0.037	0.067	10.720		
AIC	0.029	0.045	0.068	15.447		
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.lse	<b>0</b>	<b>0</b>	<b>0</b>	1.632	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	1.640	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	1.632		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	1.766		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	1.768		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.921	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.748	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.999		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.728		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.849		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.261	<b>0</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.199	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.222		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.177		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.297		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	6.095	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	6.960	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.010	5.824		
AIC	0.002	0.006	0.010	7.446		
BIC	0.002	0.006	0.010	7.412		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	2.531	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	2.746	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.007	2.467		
AIC	0.001	0.003	0.007	2.933		
BIC	0.001	0.003	0.007	2.920		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	0.646	<b>0</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	0.621	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	<b>0</b>	0.611		
AIC	<b>0</b>	<b>0</b>	<b>0</b>	0.712		
BIC	<b>0</b>	<b>0</b>	<b>0</b>	0.639		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	23.828	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.001	0.001	0.001	28.516	0.002	
AICc	0.001	0.002	0.026	20.704		
AIC	0.010	0.016	0.026	30.325		
BIC	0.010	0.016	0.026	30.303		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	9.094	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	10.848	0.001	
AICc	<b>0</b>	<b>0</b>	0.011	8.188		
AIC	0.010	0.010	0.011	11.884		
BIC	0.010	0.010	0.011	11.864		
CV.lse	<b>0</b>	<b>0</b>	<b>0</b>	2.028	<b>0</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0</b>	<b>0</b>	<b>0</b>	2.238	<b>0</b>	
AICc	<b>0</b>	<b>0</b>	0.006	2.079		
AIC	0.006	0.009	0.010	3.023		
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.lse	0.005	0.004	0.008	3.384	0.003	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.001</b>	<b>0.001</b>	0.005	3.444	<b>0.001</b>	
AICc	0.002	<b>0.001</b>	0.003	3.455		
AIC	<b>0.001</b>	<b>0.001</b>	0.003	3.711		
BIC	<b>0.001</b>	<b>0.001</b>	0.003	3.701		
CV.lse	0.010	0.010	0.010	1.866	0.010	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	0.010	0.010	0.010	1.519	0.010	
AICc	0.010	0.010	<b>0.009</b>	2.116		
AIC	0.010	0.010	<b>0.009</b>	1.476		
BIC	0.010	0.010	<b>0.009</b>	1.505		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.552	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.412	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.468		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.326		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.546		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	12.877	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	14.608	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.019	12.408		
AIC	<b>0.01</b>	0.012	0.020	15.535		
BIC	<b>0.01</b>	0.012	0.020	15.515		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	5.166	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	5.572	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.011	5.099		
AIC	<b>0.01</b>	<b>0.01</b>	0.012	5.931		
BIC	<b>0.01</b>	<b>0.01</b>	0.012	5.921		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.203	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.131	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.129		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.298		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.251		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	49.772	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.003
CV.min	<b>0.01</b>	<b>0.01</b>	0.011	59.586	<b>0.01</b>	
AICc	<b>0.01</b>	0.022	0.057	43.221		
AIC	0.023	0.038	0.057	62.969		
BIC	0.023	0.038	0.057	62.940		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	18.349	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	21.851	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.026	16.449		
AIC	0.013	0.020	0.027	23.839		
BIC	0.013	0.020	0.027	23.828		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.579	<b>0.01</b>	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.949	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.012	3.663		
AIC	<b>0.01</b>	<b>0.01</b>	0.013	5.273		
BIC	<b>0.01</b>	<b>0.01</b>	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.lse	0.006	0.005	0.009	3.765	0.004	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	0.002	0.002	0.006	3.830	<b>0.001</b>	
AICc	0.003	0.002	0.003	3.830		
AIC	0.002	<b>0.001</b>	0.003	4.133		
BIC	0.002	<b>0.001</b>	0.003	4.122		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.071	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.685	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.342		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.640		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.680		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.612	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.460	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.515		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.361		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.592		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	14.293	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	16.209	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.022	13.770		
AIC	<b>0.01</b>	0.014	0.022	17.237		
BIC	<b>0.01</b>	0.014	0.022	17.212		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	5.737	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	6.183	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.014	5.655		
AIC	<b>0.01</b>	<b>0.01</b>	0.014	6.577		
BIC	<b>0.01</b>	<b>0.01</b>	0.014	6.569		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.331	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.250	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.251		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.436		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.397		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	55.351	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.003
CV.min	<b>0.01</b>	0.011	0.011	66.260	0.011	
AICc	<b>0.01</b>	0.025	0.064	48.089		
AIC	0.026	0.042	0.064	70.016		
BIC	0.026	0.042	0.064	69.985		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	20.360	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	24.284	<b>0.01</b>	
AICc	<b>0.01</b>	0.011	0.030	18.274		
AIC	0.017	0.021	0.030	26.493		
BIC	0.017	0.021	0.030	26.479		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	3.954	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	4.363	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.015	4.053		
AIC	<b>0.01</b>	0.011	0.016	5.825		
BIC	<b>0.01</b>	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.lse	0.007	0.005	0.009	3.972	0.004	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.002</b>	<b>0.002</b>	0.006	4.040	<b>0.002</b>	
AICc	0.003	<b>0.002</b>	0.003	4.047		
AIC	0.003	<b>0.002</b>	0.003	4.364		
BIC	0.003	<b>0.002</b>	0.003	4.352		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.184	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.776	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	2.469		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.731		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.784		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.646	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.486	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.544		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.381		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	0.617		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	15.128	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	17.128	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.023	14.556		
AIC	<b>0.01</b>	0.015	0.023	18.235		
BIC	<b>0.01</b>	0.015	0.023	18.207		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	6.048	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	6.528	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.016	5.956		
AIC	<b>0.01</b>	<b>0.01</b>	0.016	6.944		
BIC	<b>0.01</b>	<b>0.01</b>	0.016	6.936		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.404	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 0.000
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.319	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.321		
AIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.514		
BIC	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	1.473		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	58.216	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 0.004
CV.min	0.011	0.011	0.011	69.840	0.011	
AICc	<b>0.01</b>	0.028	0.068	50.604		
AIC	0.027	0.045	0.068	73.731		
BIC	0.027	0.045	0.068	73.701		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	21.483	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 0.001
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	25.571	<b>0.01</b>	
AICc	<b>0.01</b>	0.011	0.031	19.296		
AIC	0.019	0.022	0.032	27.943		
BIC	0.019	0.022	0.032	27.930		
CV.lse	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	4.172	<b>0.01</b>	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 0.002
CV.min	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	4.606	<b>0.01</b>	
AICc	<b>0.01</b>	<b>0.01</b>	0.017	4.275		
AIC	<b>0.01</b>	0.012	0.017	6.141		
BIC	<b>0.01</b>	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	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 33.33
CV.min	103.86	78.52	31.82	53.4	32.61	
AICc	98.7	77.59	49.32	50.55		
AIC	610.28	607.78	579.95	51.89		
BIC	30.26	26.24	20.04	25.37		
CV.1se	44.17	32.54	20.14	30.83	18.92	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 33.31
CV.min	111.63	84.28	33.09	55.46	32.41	
AICc	104.35	81.41	52.45	52.7		
AIC	610.41	607.82	581.21	53.96		
BIC	30.89	26.5	20	25.76		
CV.1se	46.46	33.38	20.35	31.05	18.88	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 33.07
CV.min	114.78	86.83	34.4	55.02	33.29	
AICc	106.32	82.36	52.01	52.52		
AIC	603.04	600.74	573.89	53.5		
BIC	31.48	26.8	19.88	26.37		
CV.1se	24.04	17.97	12.28	37.57	11.93	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 26.34
CV.min	77.63	53.9	19.1	115.49	26.51	
AICc	79.62	59.8	48.82	98.15		
AIC	741.05	735.09	706.78	151.85		
BIC	19.81	16.69	11.64	18.04		
CV.1se	25.49	18.63	12.2	40.99	11.94	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 26.43
CV.min	82.84	57.87	18.8	119.47	24.93	
AICc	83.24	62.61	48.16	98.94		
AIC	742.59	736.48	708.61	158.24		
BIC	19.78	16.56	11.67	18.13		
CV.1se	27.1	19.2	12.26	40.54	11.86	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 26.14
CV.min	85.99	60.35	19.91	114.82	25.63	
AICc	85.41	64.03	48.92	100.32		
AIC	736.9	730.77	702.45	151.49		
BIC	19.93	16.69	11.48	18.45		
CV.1se	8.77	6.95	4.92	41.55	5.06	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 19.71
CV.min	47.87	28.53	9.83	139.79	22.76	
AICc	57.57	39.53	39.22	105.73		
AIC	829.32	820.64	811.42	314.03		
BIC	8.92	7.28	3.28	10.28		
CV.1se	8.77	7	4.8	45.41	4.88	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 19.37
CV.min	50.91	31.32	9.68	143.08	20.9	
AICc	59.87	43.09	41.37	105.96		
AIC	831.55	823.04	812.95	319.27		
BIC	8.23	6.88	3.21	9.9		
CV.1se	9.12	7.02	4.69	43.14	4.97	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 19.73
CV.min	53.04	33.09	9.76	136.65	20.59	
AICc	60.92	42.57	42.85	105.45		
AIC	827.65	819.44	809.05	303.68		
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.lse	187.94	139.04	74.14	146.74	92.12	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 124.19
CV.min	291.71	225.47	100.87	213.09	158.64	
AICc	219.14	186.37	173.07	187.93		
AIC	746.18	738.06	708.24	255.23		
BIC	93.41	79.6	59.12	85.74		
CV.lse	198.73	146.75	74.36	154.43	88.12	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 123.77
CV.min	305.62	236.71	102.89	223.18	151.13	
AICc	225.69	192.07	173.83	196.54		
AIC	751.72	743.47	714.42	268.57		
BIC	91.97	79.48	58.92	86.63		
CV.lse	205.35	151.83	76.5	155.42	90.38	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 123.58
CV.min	310.8	240.87	106.84	222.72	154.28	
AICc	229.17	195.05	174.06	196.76		
AIC	748.26	740.18	711.04	267.17		
BIC	93.14	79.97	59.82	88.14		
CV.lse	93.86	62.93	32.51	119.46	63.86	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 90.22
CV.min	192.97	130.58	51.98	203.89	153.25	
AICc	158.06	135.07	182.65	166.58		
AIC	824.28	813.34	804.09	356.82		
BIC	24.33	27.67	10.73	40.98		
CV.lse	97.87	66	32.8	126.4	57.39	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 90.23
CV.min	202.76	137.52	52.74	209.57	142.98	
AICc	162.27	138.56	181.45	173.6		
AIC	827.91	817.81	807.78	371.71		
BIC	17.21	24.66	10.35	38.9		
CV.lse	102.12	68.89	32.98	126.27	59.9	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 89.22
CV.min	205.75	143.69	54.71	207.26	145.74	
AICc	163.21	141.64	181.46	175.05		
AIC	825.37	814.97	803.91	365.56		
BIC	15.59	23.61	9.46	38.24		
CV.lse	4.84	1.78	0.27	76.42	3.58	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 56.16
CV.min	67.74	22.94	3.4	182.61	65.14	
AICc	73.42	78.11	61.22	134.75		
AIC	873.7	862.77	873.73	462.82		
BIC	0.44	0.51	0	2.68		
CV.lse	3.35	1.25	0.14	79.35	2.72	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 56.21
CV.min	61.22	21.26	2.7	184.1	58.35	
AICc	69.75	75.45	78.41	136.51		
AIC	874.96	864.43	874.21	477.01		
BIC	0.27	0.29	0	2.05		
CV.lse	3.16	1.02	0.17	76.28	1.82	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 56.5
CV.min	62.94	22.13	2.83	179.17	59.51	
AICc	71.97	76.23	66.45	134.42		
AIC	872.69	862.02	872.35	471.88		
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.lse	294.74	224.66	128.15	228	238.61	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 208.71
CV.min	408.34	325.49	175.48	300.71	364.97	
AICc	283.24	251.72	253.6	252.77		
AIC	788.18	776.49	752.2	369.07		
BIC	46.61	87.42	98.48	108.5		
CV.lse	305.57	235.05	129.77	235.3	226.11	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 208.79
CV.min	421.3	339.42	181.28	308.14	350.87	
AICc	289.92	258.65	252.81	259.51		
AIC	792.48	780.96	756.95	381.33		
BIC	22.87	81.48	100.23	103.41		
CV.lse	311.09	238.15	134.29	234.09	232	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 209.43
CV.min	425.03	341.01	187.11	307.37	356.24	
AICc	291.91	259.85	252.12	258.04		
AIC	790.06	779.16	754.31	381.4		
BIC	17.89	78.71	103.31	100.59		
CV.lse	117.97	66.72	16.48	162.68	114	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 143.25
CV.min	242.29	150.86	44.91	252.26	244.73	
AICc	180.21	169.95	232.87	199.96		
AIC	845.94	833.3	832.89	447.23		
BIC	0.76	2.67	0.19	13.48		
CV.lse	115.95	65.9	13.95	167.65	110.69	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 144
CV.min	248.62	157.09	41.49	256.44	248.62	
AICc	180.51	173.18	234.91	204.3		
AIC	848.75	836.24	834.17	457.89		
BIC	0.66	1.65	0.03	9.28		
CV.lse	118.78	69.51	12.47	166.55	110.96	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 143.6
CV.min	251.2	160.55	41.95	252.97	249.02	
AICc	179.73	174.42	236.68	205.2		
AIC	846.39	833.79	831.4	457.58		
BIC	0.45	1.24	0.13	8.69		
CV.lse	1.75	0.14	0.03	81.17	1.44	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 77.92
CV.min	50.5	7.13	1.01	194.17	52.22	
AICc	61.46	92.2	42.85	137.24		
AIC	881.85	869.79	887.57	510.94		
BIC	0.11	0.05	0	0.89		
CV.lse	1.26	0.12	0.02	82.25	1.08	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 78.04
CV.min	41.82	6.08	0.75	193.11	39.59	
AICc	53.43	85.17	50.76	138.06		
AIC	882.18	871.13	887.71	523.07		
BIC	0.08	0.04	0	0.8		
CV.lse	0.77	0.12	0.01	77.97	0.72	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 77.5
CV.min	40.83	5.28	0.77	188.83	39.76	
AICc	54.18	85.55	46.09	134.93		
AIC	880.12	868.15	885.31	516.08		
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.lse	383.94	283.47	150.44	298.63	405.93	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 293.07
CV.min	511.85	408.4	245.72	379.06	544.93	
AICc	309.75	297.8	336.43	300.16		
AIC	821.08	804.86	787.57	470.44		
BIC	0.35	1.58	98.03	13.45		
CV.lse	386.54	288.5	148.59	299.91	407.31	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 293.71
CV.min	519.75	416.18	245.95	379.94	555.02	
AICc	308.44	301.81	337.2	301.94		
AIC	825.11	809.5	790.08	477.91		
BIC	0.33	0.69	81.75	8.08		
CV.lse	394	292.04	145.63	296.62	412.44	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 293.26
CV.min	524.47	420.01	245.65	378.06	560.97	
AICc	310.24	301.48	337.78	297.73		
AIC	822.44	806.85	788.27	478.03		
BIC	0.31	0.75	77.53	6.91		
CV.lse	99.77	23.82	0.51	186.02	105.59	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 216.99
CV.min	259.46	100.91	5.01	285.17	263.4	
AICc	167.62	192.74	279.62	211.05		
AIC	859.47	844.17	852.09	513.5		
BIC	0.17	0.12	0	2.08		
CV.lse	82.81	14.43	0.27	187.17	85.67	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 214.81
CV.min	249.8	85.88	3.7	286.65	254.83	
AICc	156.61	191.14	283.4	211.14		
AIC	861.78	846.79	852.79	520.13		
BIC	0.14	0.12	0	1.62		
CV.lse	82.72	16.1	0.28	181.5	83.58	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 215.03
CV.min	249.18	91.76	3.45	279.84	253.07	
AICc	158.92	189.29	279.88	210.19		
AIC	859.39	844.07	850.26	519.86		
BIC	0.14	0.08	0	1.45		
CV.lse	0.7	0.01	0.01	81.98	0.76	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 90.72
CV.min	36.36	2.03	0.47	198.47	36.68	
AICc	46.73	112.57	22.42	139.26		
AIC	885.63	873.54	896.81	537.14		
BIC	0.07	0.01	23.29	0.52		
CV.lse	0.69	0.02	0	80.73	0.67	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 91.39
CV.min	29.29	1.66	0.39	197.07	27.85	
AICc	37.82	101.97	23.89	138.07		
AIC	885.94	874.09	896.62	543		
BIC	0.05	0.01	5.37	0.42		
CV.lse	0.18	0.01	0.01	74.07	0.56	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 89.48
CV.min	27.58	1.41	0.33	189.77	25.25	
AICc	38.09	99.59	23.41	134.13		
AIC	883.15	871.17	893.98	538.49		
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 33.25
CV.min	103.76	78.8	31.81	53.81	32.47	
AICc	98.46	71.29	25.58	50.62		
AIC	609.88	607.64	580.35	51.92		
BIC	30.07	25.32	18.57	25.45		
CV.1se	85.95	59.01	22.88	35.13	18.98	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 32.89
CV.min	173.58	132.96	51.72	45.41	30.13	
AICc	146.22	111.74	45.27	45.18		
AIC	539.76	539.6	515.24	45.28		
BIC	39.09	29.4	16.72	34.08		
CV.1se	150.02	120.25	60.25	11.45	32.54	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 30.44
CV.min	226.55	191.62	98.54	12.54	58.04	
AICc	190.68	160.9	82.9	12.54		
AIC	243	239.05	197.57	12.54		
BIC	71.07	57.39	20.73	12.46		
CV.1se	24.05	18.18	12.51	38.68	11.99	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 26.18
CV.min	77.57	53.9	19.19	117.71	25.94	
AICc	79.04	49.77	13.8	97.49		
AIC	741.44	735.3	707.14	154.26		
BIC	19.89	15.73	10.19	18.04		
CV.1se	45.8	31.51	12.76	65.94	12.36	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 25.84
CV.min	125.9	93.68	28.08	125.17	23.86	
AICc	115.44	82.27	24.26	112.66		
AIC	688.78	684	652.99	129.65		
BIC	19.86	15.23	8.09	24.1		
CV.1se	62.36	64.82	38.31	15.39	24.64	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 23.28
CV.min	158.96	137.62	66.45	26.62	50.78	
AICc	141.65	114.83	50.41	26.15		
AIC	377.88	388.6	358.26	26.24		
BIC	1.36	1.04	1.11	15.95		
CV.1se	8.8	7	4.92	44.83	5.08	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 19.21
CV.min	48.52	28.86	9.74	141.58	21.95	
AICc	56.72	24.17	4.06	106.35		
AIC	829.75	821.38	811.62	313.25		
BIC	8.98	6.23	1.63	10.14		
CV.1se	4.39	5.4	3.2	52.64	5.18	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 18.97
CV.min	56.57	45.85	11.03	139.38	16.07	
AICc	66.87	38.72	2.97	114.28		
AIC	798.28	790.49	773.39	252.81		
BIC	2.44	1.77	0.96	3.45		
CV.1se	1.01	1	1	12.12	1.22	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 16.45
CV.min	6.89	5.06	2.4	56.98	10.16	
AICc	12.86	1.84	1	55.73		
AIC	533.45	552.92	519.96	64.96		
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.lse	189.31	139.46	73.87	147.15	91	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 122.78
CV.min	294.18	225.93	100.33	214.59	157.98	
AICc	219.73	179.51	129.5	189.09		
AIC	744.98	736.27	707.21	254.54		
BIC	92.2	75.5	52.55	86.25		
CV.lse	286.64	223.7	103.06	201.21	92.9	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 122.51
CV.min	396.96	324.17	154.11	258.04	140.39	
AICc	282.54	240.41	163.36	234.93		
AIC	725.19	717.34	686.23	275.34		
BIC	47.23	75.62	59.96	85.34		
CV.lse	343.32	289.56	174.1	48.16	139.93	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 119.51
CV.min	433.1	383.15	223.99	63.04	179.43	
AICc	321.61	289.37	208.99	62.33		
AIC	439.84	423.48	377.82	62.64		
BIC	1.5	1.05	1.75	32.92		
CV.lse	94.13	62.87	32.34	120.57	63.43	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 90.22
CV.min	194.28	130.79	51.03	205.17	151.64	
AICc	156.58	120.05	91.37	165.97		
AIC	823.94	812.81	803.32	357		
BIC	24.13	21.07	1.31	40.85		
CV.lse	110.61	97.57	41.36	149.28	57.1	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 89.65
CV.min	247.13	199.81	77.33	228.2	106.15	
AICc	185.73	162.71	130.64	196.87		
AIC	813.03	804.22	788.13	382.78		
BIC	1.29	0.9	0.12	4.35		
CV.lse	13.2	38.87	28.91	46.86	86.02	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 86.22
CV.min	91.69	148.19	77.18	90.96	136.18	
AICc	66.79	54.07	51.49	87.81		
AIC	567.7	553.16	511.68	94.55		
BIC	1.45	1.05	1	3.31		
CV.lse	4.79	1.67	0.21	79.02	3.63	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 55.94
CV.min	66.4	24.39	3.5	183.81	65.76	
AICc	72.26	28.51	0.32	135.4		
AIC	872.68	861.48	872.95	464.25		
BIC	0.38	0.09	0	2.63		
CV.lse	0.13	0.05	0.01	42.91	0.5	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 55.62
CV.min	14.64	7.21	0.83	146.94	13.54	
AICc	30.47	3.29	0.45	112.22		
AIC	865.25	855.61	859.09	477.54		
BIC	0.16	0.07	0	0.66		
CV.lse	0.17	0.19	0.27	3.57	0.45	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 52.3
CV.min	7.51	4.62	1.39	50.23	2.88	
AICc	12.82	1.48	0.93	56.12		
AIC	694.36	675.13	662.68	99.31		
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.lse	295.67	224.76	126.9	227.98	237.94	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 209.76
CV.min	409.33	324.61	174.62	300.53	365.75	
AICc	283.83	244.32	221.26	252.41		
AIC	787.27	775.72	750.87	367.77		
BIC	48.51	76.81	94.48	108.98		
CV.lse	381.43	313.85	185.07	258.75	183.17	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 209.36
CV.min	502.88	427.02	253.3	342.89	238.47	
AICc	326.77	300.72	247.32	282.31		
AIC	785.69	775.73	749.02	411.89		
BIC	0.79	0.54	34.18	3.68		
CV.lse	424.02	368.39	247.85	61.94	209.98	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 205.71
CV.min	534.23	478.03	314.91	110.51	258.8	
AICc	346.23	340.85	289.79	106.08		
AIC	549.23	528.48	478.09	114.49		
BIC	1.48	1.05	1	2.21		
CV.lse	118.11	65.7	17.56	164.9	113.82	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 143.47
CV.min	245.02	151.66	45.64	252.48	245.91	
AICc	179.45	152.77	172.19	199.51		
AIC	845.22	832.26	831.89	447.16		
BIC	0.88	0.61	0.02	14.12		
CV.lse	22.33	21.53	0.62	140.9	25.15	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 143.47
CV.min	175.27	122.49	6.11	241.24	130.73	
AICc	123.73	133.25	175.33	191.04		
AIC	843.24	832.53	824.17	488.75		
BIC	0.29	0.12	0	1.27		
CV.lse	0.66	0.68	0.53	21.21	2.22	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 139.45
CV.min	9.09	8.97	1.55	88.13	14.64	
AICc	16.5	1.8	1.58	92.84		
AIC	648.45	629.05	596.25	147.76		
BIC	1.46	1.04	0.96	1.54		
CV.lse	1.41	0.22	0.01	84.18	1.24	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 77.65
CV.min	50.87	7.05	0.99	194.69	51.01	
AICc	60.65	15.8	0.77	139.02		
AIC	880.93	869.36	887.1	513.59		
BIC	0.09	0.01	72.43	0.91		
CV.lse	0.03	0.01	0	33.29	0.46	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 77.66
CV.min	9.02	2.35	0.31	135.51	9.12	
AICc	20.81	0.5	0.54	101.99		
AIC	871.52	859.96	871.15	515.82		
BIC	0.06	0.01	0	0.35		
CV.lse	0.03	0.04	0.05	0.93	0.44	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 73.55
CV.min	6.97	4.16	1.25	33.26	4.64	
AICc	12.79	1.19	0.34	37.12		
AIC	746.35	724.68	727.14	91.97		
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.lse	387.27	282.37	148.34	299.09	405.88	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 293.21
CV.min	514.87	409.51	243.47	379.2	546.18	
AICc	308.96	290.14	321.3	300.18		
AIC	820.4	803.49	785.31	467.88		
BIC	0.4	0.13	239.99	13.26		
CV.lse	362.56	272.47	21.94	237.95	337.59	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 293.08
CV.min	545.77	453.54	80.12	341.17	570.23	
AICc	206.92	294.14	346.83	258.82		
AIC	825.52	811.79	789.99	506.01		
BIC	0.18	0.06	11.17	1.12		
CV.lse	138.52	113.35	1.64	26.09	58.83	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 292.24
CV.min	367.65	299.18	8.68	108.77	236.57	
AICc	21.03	49.19	373.04	108.62		
AIC	655.08	630.68	585.9	205.08		
BIC	1.43	1.02	0.83	1.57		
CV.lse	100.97	21.71	0.46	188.19	103.56	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 215.38
CV.min	262.26	97.96	5.38	285.37	264.16	
AICc	164.94	172.26	167.66	211.65		
AIC	859.08	842.76	851.85	513.31		
BIC	0.21	0.02	57.73	2.33		
CV.lse	1.16	0.22	0.01	100.15	0.94	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 215.2
CV.min	43.6	11.7	0.7	220.4	43.56	
AICc	50.78	20.82	92.93	157.62		
AIC	856.8	842.84	841.34	536.23		
BIC	0.09	0.02	0	0.49		
CV.lse	0.08	0.06	0.12	2.54	0.43	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 211.72
CV.min	8.94	5.47	1.44	47.71	5.17	
AICc	15.13	1.57	0.61	55.82		
AIC	719.38	695.56	676.52	227.69		
BIC	1.02	0.78	0.29	1.44		
CV.lse	0.54	0.02	0.01	84.71	0.61	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 91.35
CV.min	36.97	1.99	0.41	199.88	34.32	
AICc	46.82	11.92	0	138.77		
AIC	885.04	873.33	897.03	543		
BIC	0.07	0	630.51	0.52		
CV.lse	0.02	0	0	29.41	0.44	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 90.94
CV.min	7.32	1.13	0.21	130.17	7.21	
AICc	17.58	0.3	0	98.87		
AIC	872.97	860.48	877.79	531.04		
BIC	0.05	0	16.53	0.3		
CV.lse	0.01	0.01	0.01	0.7	0.43	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 87.01
CV.min	5.43	2.73	0.68	30.47	4.77	
AICc	11.34	0.51	0.04	32.27		
AIC	778.52	754.45	769.48	99.03		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	104.08	78.72	31.83	53.45	32.56	
AICc	98.98	77.6	49.53	50.58		
AIC	610.24	607.85	580.06	51.93		
BIC	30.26	26.27	20.03	25.44		
CV.1se	44.05	32.41	20.14	30.74	18.92	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	111.63	84.08	33.12	55.42	32.39	
AICc	104.11	81.17	52.37	52.6		
AIC	610.47	607.84	581.21	53.89		
BIC	30.88	26.52	19.98	25.81		
CV.1se	46.51	33.25	20.37	30.94	18.89	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	114.65	86.73	34.43	54.94	33.32	
AICc	106.36	82.32	52.09	52.42		
AIC	603.01	600.65	573.87	53.42		
BIC	31.45	26.79	19.89	26.34		
CV.1se	24.12	18	12.28	37.66	11.93	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	77.65	53.99	19.18	115.31	26.75	
AICc	79.7	60.07	48.95	98.08		
AIC	740.95	735.1	706.81	151.88		
BIC	19.82	16.68	11.65	18.05		
CV.1se	25.48	18.62	12.19	40.73	11.94	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	82.88	57.91	18.81	119.38	24.97	
AICc	83.27	62.65	48.1	99		
AIC	742.55	736.42	708.63	158.35		
BIC	19.8	16.57	11.68	18.14		
CV.1se	27.06	19.2	12.25	40.53	11.86	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	85.96	60.33	19.87	114.79	25.6	
AICc	85.49	64.06	48.59	100.28		
AIC	737.07	730.88	702.58	151.4		
BIC	19.91	16.68	11.48	18.43		
CV.1se	8.8	6.95	4.91	41.65	5.07	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	47.95	28.46	9.81	139.88	22.67	
AICc	57.78	39.55	38.41	105.62		
AIC	829.25	820.55	811.29	314.29		
BIC	8.95	7.28	3.27	10.28		
CV.1se	8.74	6.96	4.82	45.44	4.89	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	50.7	31.3	9.68	143.2	20.67	
AICc	59.86	42.8	41.65	105.83		
AIC	831.69	823.13	813.1	319.72		
BIC	8.24	6.9	3.23	9.92		
CV.1se	9.09	6.99	4.67	42.87	4.94	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	52.97	32.97	9.71	136.41	20.61	
AICc	60.81	42.54	42.61	105.16		
AIC	827.67	819.49	808.99	303.88		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	273.32	210.69	97.36	202.52	140	
AICc	212.68	178.18	151.76	181.73		
AIC	742.41	733.99	705	242.57		
BIC	96.16	82.53	61.51	87.36		
CV.1se	188.41	140.01	74.22	147.32	81.29	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	289.76	221.83	99.21	213.1	134.08	
AICc	219.83	186.01	157.36	189.56		
AIC	747.09	739.6	711.53	257.5		
BIC	96.13	82.15	61.47	87.16		
CV.1se	194.84	144.12	76.4	148.48	84.21	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	294.36	226.66	103.29	212.98	137.41	
AICc	224.82	188.63	156.12	190.14		
AIC	744.2	736.1	707.58	256.68		
BIC	98.35	83.67	62.07	89.85		
CV.1se	92.82	63.09	33.42	116.47	61.88	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	189.27	129.13	52.46	199.8	146.01	
AICc	156.92	133.8	177.89	165.06		
AIC	822.82	812.25	802.46	349.39		
BIC	27.09	29.39	12.51	42.5		
CV.1se	97.71	66.33	34.01	123.65	56.4	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	200.44	136.59	53.86	206.79	135.58	
AICc	160.48	137.61	178.76	171.72		
AIC	826.98	816.89	806.41	366.05		
BIC	20.09	26.68	12.12	40.6		
CV.1se	101.85	69.13	34.08	124.03	58.66	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	203.2	142.1	54.92	203.48	139.78	
AICc	161.88	139.63	170.51	170.88		
AIC	824.07	813.66	803.39	359.09		
BIC	18.13	25.73	11.32	40.25		
CV.1se	5.14	1.94	0.32	75.75	3.89	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	68.01	23.77	3.63	181.1	65.78	
AICc	73.78	78.02	58.36	134.92		
AIC	873.17	862.19	872.83	460.57		
BIC	0.42	0.54	0	2.88		
CV.1se	3.73	1.4	0.22	79.67	2.83	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	62.83	22.25	2.8	184.49	60.13	
AICc	71.13	76.14	77.37	136.84		
AIC	874.64	863.95	873.95	476.73		
BIC	0.32	0.31	0	2.06		
CV.1se	3.54	1.18	0.2	75.93	2.03	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	64.88	23.58	3.04	178.4	60.99	
AICc	72.02	78.07	69.22	134.39		
AIC	872.43	861.77	871.47	470.23		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	309.72	229.02	117.87	231.36	130.33	
AICc	237.05	193.49	141.41	206.89		
AIC	768.26	758.21	735.21	298.73		
BIC	134.84	115.96	90.19	124.51		
CV.1se	231.16	169.53	103.44	185.96	103.13	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	328.69	242.85	120.28	246.37	127.02	
AICc	249.65	202.7	145.94	218.38		
AIC	772.58	763.08	739.67	313.69		
BIC	139.79	120.25	92.05	128.5		
CV.1se	237.69	173.96	105.44	187.29	107.38	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	332.46	247.39	124.42	246.92	131.25	
AICc	251.99	205.79	146.88	219.8		
AIC	769.94	760.51	737.48	314.21		
BIC	141.89	122.11	92.61	130.1		
CV.1se	119.45	79.11	35.38	148.1	108.55	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	228.04	153.54	64.93	229.09	220.12	
AICc	181.78	160.48	201.95	189		
AIC	839.55	827.34	826	408.19		
BIC	1.65	10.06	1.15	31.29		
CV.1se	123.87	82.92	34.86	155.56	107.96	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	239.32	163.23	67.23	237.8	225.34	
AICc	186.12	166.46	203.71	194.05		
AIC	842.41	831.19	827.35	420.37		
BIC	1.13	5.19	0.59	22.8		
CV.1se	129.01	85.92	34.2	155.18	109.89	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	243.13	167.63	66.68	233.79	226.19	
AICc	187.36	169.38	204.68	196.69		
AIC	840	828.47	824.8	420.29		
BIC	0.91	4.39	0.79	19.91		
CV.1se	2.57	0.43	0.05	80.47	2.17	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	59.44	10.68	1.48	189.97	58.18	
AICc	66.39	89.24	43.93	139.2		
AIC	879.35	868.09	884.4	496.45		
BIC	0.15	0.08	0	1.19		
CV.1se	1.88	0.18	0.02	82.72	1.39	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	50.8	9.75	1.01	191.88	50.04	
AICc	60.04	85.66	54.66	140.12		
AIC	880.25	869.19	884.55	509.2		
BIC	0.12	0.09	0	0.96		
CV.1se	1.44	0.17	0.02	79.43	0.86	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	51.62	9.15	1.13	188.07	49.41	
AICc	62.19	85.73	48.2	137.21		
AIC	878	866.48	882.09	502.58		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	315.85	217.6	114.37	235.72	115.77	
AICc	240.77	186.24	117.42	211.66		
AIC	778.83	767.52	748.55	316.97		
BIC	151.59	123.47	98.71	142.11		
CV.1se	240.16	164.98	106.23	194.44	103.18	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	335.75	230.41	115.06	250.41	115.2	
AICc	253.11	194.89	117.28	224.09		
AIC	782.5	771.91	752.25	331.54		
BIC	158.26	128.53	99.79	149.37		
CV.1se	246.41	169.61	108.95	197.57	107.39	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	338.95	235.48	119.59	252.67	117.65	
AICc	256.47	198	118.41	227.23		
AIC	779.85	768.82	749.55	334.42		
BIC	161.59	131.61	100.9	152.24		
CV.1se	129.48	81.48	29.41	161.11	126.39	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	242.28	157.77	63.88	241.7	243.14	
AICc	189.39	169.39	217.21	199.46		
AIC	845.87	832.2	835.41	431.73		
BIC	0.45	3.82	0.76	16.61		
CV.1se	134.01	85.2	25.91	169.33	128.57	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	253.93	168.79	62.37	250.16	251.34	
AICc	196.41	178.87	213.42	206.23		
AIC	848.39	835.64	836.52	443.43		
BIC	0.37	1.65	0.13	10.15		
CV.1se	139.37	87.46	24.14	167.83	130.85	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	257.87	171.74	60.9	246.36	254.61	
AICc	197.94	180.1	215.47	206.57		
AIC	845.72	833.26	834.34	441.87		
BIC	0.39	1.11	0.23	8.32		
CV.1se	1.88	0.22	0.02	81.93	1.62	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	54.98	6.41	0.92	193.49	54.94	
AICc	63.37	99.88	29.39	139.5		
AIC	881.36	869.27	889.4	509.19		
BIC	0.11	0.03	0	0.86		
CV.1se	1.43	0.09	0.01	82.83	1.02	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	44.69	5.2	0.7	193.75	44.46	
AICc	54.93	95.46	36.01	139.94		
AIC	882.37	870.91	889.49	520.33		
BIC	0.09	0.03	0	0.76		
CV.1se	0.94	0.05	0.01	79.93	0.68	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	45.09	5.03	0.74	191.22	42.83	
AICc	56.35	95.23	32.88	137.59		
AIC	879.67	867.66	886.91	511.9		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	103.9	78.64	31.79	53.91	32.54	
AICc	98.48	71.33	25.64	50.68		
AIC	610.08	607.83	580.37	52.03		
BIC	30.11	25.35	18.6	25.49		
CV.1se	86.05	59.04	23.03	35.08	19	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	173.55	132.87	51.75	45.39	30.05	
AICc	146.39	111.64	45.26	45.15		
AIC	539.81	539.49	515.13	45.25		
BIC	39.2	29.42	16.74	34.1		
CV.1se	150.05	120.12	60.24	11.46	32.46	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	226.55	191.32	98.49	12.56	57.98	
AICc	190.69	161.01	82.82	12.56		
AIC	243.07	239.05	197.73	12.56		
BIC	70.99	57.34	20.8	12.47		
CV.1se	23.98	18.16	12.49	38.71	11.98	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	77.49	53.9	19.15	117.83	25.81	
AICc	78.84	49.84	13.8	97.65		
AIC	741.49	735.39	707.33	154.27		
BIC	19.86	15.71	10.18	18.01		
CV.1se	45.77	31.55	12.77	65.81	12.38	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	125.9	93.66	27.99	125.2	23.83	
AICc	115.2	82.06	24.12	112.61		
AIC	688.82	683.95	653.03	129.67		
BIC	19.82	15.2	8.11	24.07		
CV.1se	62.14	64.79	38.31	15.38	24.64	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	158.84	137.59	66.38	26.63	50.69	
AICc	141.65	114.91	50.47	26.13		
AIC	377.46	388.23	358.14	26.22		
BIC	1.36	1.04	1.11	15.95		
CV.1se	8.78	6.97	4.92	44.77	5.07	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	48.42	28.79	9.73	141.49	21.83	
AICc	56.7	24.13	4.05	106.25		
AIC	829.74	821.32	811.77	313.14		
BIC	8.98	6.22	1.64	10.12		
CV.1se	4.33	5.42	3.21	52.59	5.19	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	56.94	45.93	11.07	139.54	16.12	
AICc	67.06	38.82	2.93	114.56		
AIC	798.16	790.33	773.25	252.9		
BIC	2.46	1.78	0.96	3.45		
CV.1se	1.01	1	1	12.07	1.21	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	6.85	5.05	2.4	56.99	10.11	
AICc	12.81	1.83	1	55.68		
AIC	535.11	553.6	520.08	64.94		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	275.72	210.8	97.57	203.17	139.13	
AICc	212.26	171.93	108.71	182.62		
AIC	741.02	732.57	703.83	242.07		
BIC	95.76	78.13	54.98	87.86		
CV.1se	284.92	221.99	104.54	200.39	91.86	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	390.74	318.95	154.52	253.92	139.8	
AICc	283.84	240.7	155.72	232.46		
AIC	719.34	711.54	681.23	267.94		
BIC	62.29	84.45	62.49	91.74		
CV.1se	342.59	289.9	175.27	48.48	139.78	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	426.59	380.66	224.62	62.76	179.84	
AICc	323.91	291.1	206.31	62.23		
AIC	432.07	415.11	370.19	62.42		
BIC	1.55	1.06	4.77	34.2		
CV.1se	93.83	63.48	33.21	117.33	61.69	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	191.52	129.04	51.84	200.59	145.7	
AICc	156.08	118.76	84.3	163.3		
AIC	822.66	811.93	802.09	348.76		
BIC	26.51	23.2	1.76	42.37		
CV.1se	116.23	101.52	43.51	150.2	57.17	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	248.97	201.84	79.21	228.54	105.01	
AICc	188.55	164.27	129.46	198.09		
AIC	811.45	802.63	786.48	377.81		
BIC	1.34	0.96	0.16	4.54		
CV.1se	16.24	49.35	37.22	47.73	92.25	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	110.88	164.45	92.11	90.68	141.73	
AICc	77.11	65.1	63.49	88.14		
AIC	564.08	550.45	509.2	94.01		
BIC	1.46	1.06	1	3.43		
CV.1se	5.04	1.84	0.27	78.71	3.9	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	67.7	25	3.78	182.97	65.96	
AICc	73.06	29.17	0.23	135.27		
AIC	872.57	861.49	872.49	464.17		
BIC	0.42	0.1	0	2.77		
CV.1se	0.13	0.06	0.02	43.35	0.49	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	14.69	7.95	0.88	147.92	13.99	
AICc	30.49	3.35	0.77	112.34		
AIC	864.61	855.17	859.36	476.25		
BIC	0.17	0.07	0	0.7		
CV.1se	0.17	0.19	0.28	3.68	0.45	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	7.69	4.71	1.41	51.18	2.9	
AICc	12.68	1.51	0.94	56.79		
AIC	692.69	673.84	660.71	101.17		
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	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	312.77	230.16	117.75	232.7	132.73	
AICc	238.55	186.96	107.23	207.88		
AIC	767.5	757.71	734.48	297.7		
BIC	136.65	112.43	87.7	125.42		
CV.1se	351.92	280.15	152.5	261.44	138.66	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	448.81	363.11	190.88	328	170.95	
AICc	332.16	280.87	159.41	287.02		
AIC	760.54	751.67	726.14	361.97		
BIC	1.19	6.74	120.59	12.88		
CV.1se	409.63	353.68	229.43	68.54	198.23	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	490.29	435.49	269.98	105.81	229.09	
AICc	373.98	338.52	227.04	102.44		
AIC	496.49	474.8	427.14	106.07		
BIC	2.07	1.34	2.69	5.12		
CV.1se	121.2	79.38	35.15	149.49	107.9	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	229.92	153.4	64.98	231.73	221.09	
AICc	180.82	144.1	136.48	189.01		
AIC	838.97	826.44	824.64	408.23		
BIC	1.65	2.86	0.11	31.63		
CV.1se	75.16	77.87	8.87	160.02	77.52	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	252.28	210.01	41.08	248.98	158.93	
AICc	175.12	184.13	177.3	207.76		
AIC	836.61	826.58	817.29	462.59		
BIC	0.38	0.2	0	1.65		
CV.1se	1.15	3.51	0.81	32.58	21.48	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	19.35	34.54	3.75	97.19	72.07	
AICc	21.41	6.15	13.14	101.16		
AIC	626.79	608.57	575.17	142.13		
BIC	1.67	1.15	0.99	1.86		
CV.1se	2.53	0.45	0.06	83.46	1.85	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	58.87	10.96	1.34	192.27	60.1	
AICc	67.63	21.93	1.15	139.02		
AIC	878.63	867.27	884.18	495.35		
BIC	0.16	0.01	16.91	1.21		
CV.1se	0.01	0	0	36.25	0.46	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	10.17	3.22	0.36	140.85	10.11	
AICc	22.94	0.87	0.43	105.6		
AIC	870.74	859.63	869.23	510.63		
BIC	0.06	0.02	0	0.38		
CV.1se	0.04	0.05	0.08	1.22	0.44	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	8.2	4.73	1.42	36.78	4.99	
AICc	14.12	1.34	0.47	40.6		
AIC	736.73	715.86	715.33	93.56		
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	$sd(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	318.5	217.92	114.43	236.28	116.28	
AICc	241.9	179.16	101.41	213.12		
AIC	777.82	767.04	748.05	317.5		
BIC	150.79	120.13	98.02	141.96		
CV.1se	368.76	279.52	144.89	287.33	113.1	$sd(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	460.6	352.01	163.65	357.34	126.15	
AICc	341.81	272.18	128.97	309.03		
AIC	776.77	767.31	744.78	401.13		
BIC	0.52	15.34	123.67	3.36		
CV.1se	434.56	363.17	226.51	86.17	186.96	$sd(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	518.82	437.77	250.23	144.27	211.49	
AICc	391.51	338.85	201.81	138.83		
AIC	533.99	511.1	466.14	149.71		
BIC	2.86	1.9	51.45	2.99		
CV.1se	132.12	82.35	29.31	162.1	127.28	$sd(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	244.8	158.63	64.23	242.68	244.45	
AICc	192.86	152.89	145.25	200.17		
AIC	845.23	831.63	834.85	433.28		
BIC	0.51	0.42	0.06	16		
CV.1se	39.08	39.47	0.84	157.52	43.03	$sd(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	217.3	167.02	6.82	252.89	178.42	
AICc	140.57	184.71	200.87	206.66		
AIC	844.4	833.66	828.74	492.97		
BIC	0.17	0.07	0	1.01		
CV.1se	0.76	0.77	0.52	17.07	2.19	$sd(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	15.64	13.74	2.38	88.07	15.8	
AICc	20.44	4.15	9.33	95.41		
AIC	663.89	643.78	617.88	192.64		
BIC	2.14	1.41	0.87	2.52		
CV.1se	1.82	0.18	0.03	84.71	1.36	$sd(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 100</i>
CV.min	54.45	6.51	1.01	194.39	54.99	
AICc	63.21	17.4	0	139.85		
AIC	880.57	868.78	888.79	509.84		
BIC	0.1	0	171.44	0.9		
CV.1se	0.01	0.01	0	34.1	0.45	$sd(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 100</i>
CV.min	9.14	2.15	0.33	138.25	9.14	
AICc	20.94	0.44	0	102.34		
AIC	871.94	859.89	873.45	519.26		
BIC	0.06	0.01	0	0.29		
CV.1se	0.03	0.03	0.04	1.03	0.45	$sd(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 100</i>
CV.min	8.37	4.41	1.28	32.84	6	
AICc	14.04	1.13	0.16	35.73		
AIC	757.48	735.05	742.32	103.11		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 21.25
CV.min	46.71	25.28	5.6	70.51	34.93	
AICc	20.3	15.31	49.62	26.53		
AIC	109.15	96.42	74.5	86.93		
BIC	107.58	94.95	73.11	80.43		
CV.1se	8.49	5.59	1.91	41.74	5.52	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 20.95
CV.min	41.33	23.91	5.15	72.56	28.29	
AICc	18.79	14.63	50.08	26.91		
AIC	110.09	97.3	75.5	88.14		
BIC	108.36	95.99	74.14	83.13		
CV.1se	7.83	5.05	1.68	40.55	5.59	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 20.71
CV.min	40.17	22.04	4.69	70.46	26.4	
AICc	18.22	13.82	49.99	26.66		
AIC	109.97	97.37	75.89	88.06		
BIC	108.41	95.98	74.52	82.55		
CV.1se	1.81	0.77	0.25	45.13	1.53	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 14.52
CV.min	19.6	6.41	1.06	78.51	17.37	
AICc	10.38	12.39	52.62	23.34		
AIC	112.87	97.64	75.83	93.21		
BIC	111.57	95.91	73.99	92.05		
CV.1se	1.2	0.53	0.23	47.02	1.04	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 14.39
CV.min	16.82	5.74	0.95	79.98	14.55	
AICc	10.03	10.77	52.56	23.15		
AIC	113.35	98.15	76.48	93.57		
BIC	112.01	96.85	74.6	92.26		
CV.1se	1.36	0.77	0.26	44.47	1.26	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 14.05
CV.min	16.81	6.04	1.02	77.34	14.41	
AICc	9.84	9.51	51.91	23.51		
AIC	113.02	98.35	76.9	93.64		
BIC	111.6	96.94	74.91	92.05		
CV.1se	0.27	0.05	0.02	48.27	0.55	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 7.82
CV.min	7.44	1.22	0.23	81.9	7.52	
AICc	5.64	30.06	55.3	20.57		
AIC	115.24	95.81	73.4	96.25		
BIC	114.03	94.19	71.41	95.64		
CV.1se	0.29	0.1	0.03	48.6	0.5	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 7.96
CV.min	7.52	1.27	0.26	83.11	7.38	
AICc	5.61	26.75	54.85	21.48		
AIC	115.25	96.35	74.18	96.43		
BIC	113.81	94.91	72.11	95.78		
CV.1se	0.38	0.1	0.04	46.61	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 7.57
CV.min	7.59	1.24	0.25	80.87	7.52	
AICc	5.84	25.25	55.49	21.38		
AIC	115.14	96.36	74.23	96.08		
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 56.85</i>
CV.min	17.15	2.34	0.45	85.15	18.97	
AICc	8.05	37.06	55.48	22.98		
AIC	113.89	93.58	71.13	95.05		
BIC	112.8	91.86	69.5	94.36		
CV.1se	0.63	0.18	0.06	51.6	0.71	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 56.18</i>
CV.min	15.5	2.1	0.36	84.16	15.71	
AICc	7.89	35.41	55.16	23.4		
AIC	114.46	94.27	72.03	95.35		
BIC	113.28	92.48	70.15	94.78		
CV.1se	0.84	0.24	0.05	49.94	0.74	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 56.48</i>
CV.min	14.96	1.93	0.37	82.39	13.87	
AICc	7.28	33.16	55.39	22.38		
AIC	114.37	94.58	72.16	95.4		
BIC	113.12	92.84	70.35	94.57		
CV.1se	0.53	0.06	0.03	50.93	0.68	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 31.69</i>
CV.min	10.62	1.05	0.24	84.51	9.83	
AICc	6.39	42.84	56.81	22.2		
AIC	114.97	92.18	69.79	96.23		
BIC	113.77	90.33	68.38	95.62		
CV.1se	0.27	0.05	0.03	48.97	0.54	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 31.41</i>
CV.min	9.01	0.9	0.19	84.28	8.51	
AICc	6.15	42.39	56.52	22.08		
AIC	115.07	93.07	70.49	96.3		
BIC	113.93	91.11	68.92	95.77		
CV.1se	0.42	0.06	0.04	48.42	0.53	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 31</i>
CV.min	9.6	0.98	0.26	81.83	9.33	
AICc	5.76	41.57	56.68	21		
AIC	114.81	92.9	70.53	95.92		
BIC	113.55	90.83	69.07	95.31		
CV.1se	0.24	0.02	0.04	49.59	0.45	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 8.54</i>
CV.min	6.35	0.36	0.19	84.57	6.02	
AICc	4.92	48.6	58.18	20.96		
AIC	115.61	88.57	66.96	96.64		
BIC	114.23	86.37	66.14	96.13		
CV.1se	0.05	0.03	0.01	49.54	0.44	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 8.87</i>
CV.min	5.77	0.4	0.17	83.22	5.16	
AICc	4.98	48.24	58.18	20.31		
AIC	115.49	89.44	67.61	96.86		
BIC	114.27	87.47	66.68	96.26		
CV.1se	0.18	0.02	0.02	46.56	0.39	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 8.11</i>
CV.min	6.85	0.36	0.17	80.99	6.62	
AICc	5.24	47.74	58.33	20.57		
AIC	115.34	89.16	67.7	96.66		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 78.12
CV.min	14.36	1	0.29	84.81	16.14	
AICc	6.5	45.45	56.62	22.86		
AIC	114.51	90.73	68.48	95.75		
BIC	113.45	88.83	67.4	95.12		
CV.1se	0.56	0.1	0.04	52.87	0.6	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 77.79
CV.min	12.21	0.9	0.26	85.13	11.88	
AICc	6.6	44.09	56.53	22.42		
AIC	114.74	91.78	69.18	96.19		
BIC	113.45	89.75	67.9	95.57		
CV.1se	0.64	0.09	0.04	50.46	0.54	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 77.15
CV.min	12.02	0.88	0.24	83.31	12.45	
AICc	6.38	43.96	56.72	21.71		
AIC	114.76	91.76	69.19	95.71		
BIC	113.53	89.77	67.95	95.1		
CV.1se	0.41	0.05	0.02	51.4	0.57	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 38.01
CV.min	9.65	0.48	0.2	84.61	9.83	
AICc	5.79	47.88	57.85	21.65		
AIC	115.06	88.95	67.26	96.52		
BIC	113.92	86.81	66.33	95.9		
CV.1se	0.34	0.05	0.03	49.83	0.46	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 36.88
CV.min	7.97	0.57	0.16	83.96	8.55	
AICc	5.34	47.05	57.51	21.68		
AIC	115.16	89.52	67.85	96.67		
BIC	114.03	87.41	67	95.98		
CV.1se	0.39	0.03	0.03	47.22	0.55	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 37.12
CV.min	8.78	0.56	0.23	81.79	8.64	
AICc	5.61	46.79	57.81	21.13		
AIC	115.04	89.73	68.06	96.25		
BIC	113.7	87.74	67.02	95.4		
CV.1se	0.2	0.02	0.02	49.77	0.4	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 6.56
CV.min	5.81	0.28	0.13	84.14	5.79	
AICc	4.63	50.71	59.3	20.93		
AIC	115.53	84.84	65.39	96.71		
BIC	114.32	82.58	64.67	96.11		
CV.1se	0.13	0.03	0.01	49.55	0.47	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 6.85
CV.min	5.85	0.31	0.14	83.82	5.62	
AICc	4.95	50.11	58.96	20.32		
AIC	115.3	85.71	65.69	96.73		
BIC	114.2	83.42	64.91	96.1		
CV.1se	0.21	0.01	0.03	46.17	0.43	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 6.4
CV.min	6.48	0.31	0.15	81.45	6.37	
AICc	5.47	49.45	59.13	20.78		
AIC	115.3	85.99	65.81	96.51		
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 91.18
CV.min	12.91	0.69	0.25	85.31	14.1	
AICc	6.23	48.41	58.08	22.78		
AIC	114.65	87.76	66.3	96.1		
BIC	113.48	85.63	65.6	95.42		
CV.1se	0.45	0.04	0.04	52.25	0.53	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 90.76
CV.min	10.77	0.55	0.25	85.36	10.92	
AICc	6.18	47.28	57.96	22.01		
AIC	114.85	88.49	66.77	96.21		
BIC	113.71	86.45	65.87	95.66		
CV.1se	0.54	0.06	0.03	50.49	0.56	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 90.33
CV.min	9.88	0.6	0.24	83.82	10.41	
AICc	6.39	48.25	57.97	21.66		
AIC	114.67	88.17	66.93	95.97		
BIC	113.42	85.92	66.01	95.25		
CV.1se	0.47	0.03	0.02	51.32	0.48	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 41.56
CV.min	9.07	0.39	0.21	85.17	8.91	
AICc	5.45	49.11	58.71	21.6		
AIC	115.24	85.63	65.62	96.59		
BIC	114.08	83.57	64.94	96.04		
CV.1se	0.4	0.04	0.03	50.67	0.45	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 41.26
CV.min	7.8	0.49	0.18	84.22	7.69	
AICc	5.32	49.29	58.67	21.02		
AIC	115.28	86.49	65.74	96.41		
BIC	114.05	84.25	65.01	95.97		
CV.1se	0.39	0.02	0.02	48.12	0.54	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 40.75
CV.min	8.81	0.48	0.2	82.08	8.01	
AICc	5.9	49.58	58.71	21.5		
AIC	114.88	86.34	66.1	96.19		
BIC	113.58	83.96	65.35	95.67		
CV.1se	0.18	0.02	0.02	50.14	0.42	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 5.09
CV.min	5.9	0.25	0.17	83.88	5.82	
AICc	4.73	52.14	60.03	20.23		
AIC	115.4	81.59	64.13	96.8		
BIC	114.27	79.24	63.4	96.05		
CV.1se	0.19	0.03	0.01	49.14	0.47	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 5.6
CV.min	6.07	0.26	0.13	83.68	5.63	
AICc	4.82	51.51	59.88	20.47		
AIC	115.43	82.47	64.43	96.7		
BIC	114.34	79.92	63.69	96.1		
CV.1se	0.18	0.02	0.01	46.55	0.44	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 5.19
CV.min	6.6	0.28	0.13	81.7	6.85	
AICc	5.19	51.64	60.11	20.74		
AIC	115.45	82.32	64.49	96.47		
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 20.75
CV.min	42.21	23.33	5.17	69.95	33	
AICc	19.98	8.06	49.38	26.11		
AIC	109.18	96.34	74.39	86.92		
BIC	107.66	94.99	72.97	79.99		
CV.1se	1.31	1.14	0.63	37.72	1.69	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 20.43
CV.min	15.97	10.34	1.86	70.04	10.04	
AICc	9.96	2.15	39.05	21.17		
AIC	110.04	99.51	79.33	88.83		
BIC	108.73	98.46	78.26	76.73		
CV.1se	1.37	1.21	1.03	12.61	1.04	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 18.27
CV.min	8.59	5.65	1.7	34.12	3.12	
AICc	7.53	1.51	1.07	19.16		
AIC	103.15	92.8	73.37	55.58		
BIC	83.55	83.5	72.64	3.55		
CV.1se	1.56	0.77	0.25	45.1	1.08	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 14.43
CV.min	16.67	5.95	1.02	78.33	16.1	
AICc	10.94	1.75	53.61	22.91		
AIC	113.1	97.55	75.58	93.22		
BIC	111.76	96.18	74	91.6		
CV.1se	0.51	0.34	0.19	39.43	0.61	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 14.19
CV.min	9.68	3.89	0.7	72.96	7.51	
AICc	7.04	0.87	51.96	20.33		
AIC	113.8	100.8	80.71	93.59		
BIC	112.15	99.36	78.76	90.59		
CV.1se	1.1	0.96	0.9	6.97	0.95	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 11.62
CV.min	9	5.41	1.56	25.81	3.19	
AICc	7.81	1.47	1.78	13.76		
AIC	107.62	95.04	76	74.16		
BIC	105.62	94.71	75.15	4.18		
CV.1se	0.34	0.08	0.03	48.1	0.51	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 7.87
CV.min	6.94	1.3	0.23	81.96	6.86	
AICc	5.64	7.83	56.31	20.66		
AIC	115.31	95.89	73.5	96.41		
BIC	114.09	94.57	71.52	95.81		
CV.1se	0.09	0.07	0.02	40.22	0.43	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 7.65
CV.min	5.87	1.58	0.28	74.78	5.28	
AICc	5.28	0.63	55.06	20.2		
AIC	115.46	99.36	78.25	96.17		
BIC	113.7	97.86	76.13	95.21		
CV.1se	0.35	0.26	0.17	8.47	0.51	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 5.53
CV.min	6.83	3.64	0.81	28.53	5.08	
AICc	6.83	0.59	38.76	14.49		
AIC	114.01	97.56	79.03	90.1		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 57.19
CV.min	16.99	2.22	0.38	83.98	18.43	
AICc	8.48	14.96	56.34	23.95		
AIC	113.97	93.61	70.8	94.96		
BIC	112.86	92.01	69.16	94.19		
CV.1se	0.21	0.09	0.03	41.73	0.53	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 56.98
CV.min	7.5	1.72	0.24	76.39	7.17	
AICc	5.7	1.12	55.6	20.13		
AIC	115.07	98.4	77	96.2		
BIC	113.5	96.83	74.87	95.46		
CV.1se	0.51	0.45	0.31	7.67	0.61	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 54.95
CV.min	7.71	4.6	1.2	27.5	5.56	
AICc	7.44	0.88	25.08	14.94		
AIC	112.43	96.94	78.26	87.64		
BIC	111.37	96.52	77.03	24.07		
CV.1se	0.43	0.07	0.02	51.02	0.54	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 30.65
CV.min	10.48	0.92	0.29	84.44	10.15	
AICc	6.5	26.93	57.5	21.65		
AIC	114.66	92.06	69.78	96.07		
BIC	113.67	90.44	68.37	95.48		
CV.1se	0.21	0.06	0.02	42.44	0.57	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 30.42
CV.min	5.87	1.18	0.21	76.85	6.16	
AICc	5.05	3.51	56.35	19.82		
AIC	115.47	96.49	74.99	96.32		
BIC	113.77	94.61	72.98	95.56		
CV.1se	0.3	0.23	0.11	7.81	0.41	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 27.66
CV.min	5.86	3.2	0.67	28.37	5.21	
AICc	6.04	0.46	51.2	14.45		
AIC	114.45	97.04	78.89	91.88		
BIC	113.37	96.51	77.61	42.4		
CV.1se	0.3	0.04	0.03	48.78	0.43	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 8.65
CV.min	6.8	0.38	0.17	83.46	6.23	
AICc	5.14	46.46	59.19	20.55		
AIC	115.51	88.58	66.99	96.71		
BIC	114.39	86.71	65.95	96.09		
CV.1se	0.22	0.03	0.02	39.8	0.37	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 8.5
CV.min	5.6	0.6	0.19	74.69	5.09	
AICc	4.62	21.05	58.6	19.88		
AIC	115.61	93	71.18	96.54		
BIC	114.2	91.07	69.67	95.76		
CV.1se	0.16	0.06	0.03	7.94	0.4	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 7.26
CV.min	4.34	1.46	0.25	28.76	3.8	
AICc	4.41	0.23	62.79	14.46		
AIC	116.02	94.45	77.16	94.19		
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ <i>Oracle : 77.53</i>
CV.min	13.65	0.82	0.27	85.39	13.84	
AICc	7.11	34.13	57.96	22.79		
AIC	114.54	90.7	68.26	95.72		
BIC	113.41	88.92	67.22	95.01		
CV.1se	0.22	0.09	0.02	41.74	0.41	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ <i>Oracle : 77.53</i>
CV.min	6.41	1.13	0.19	75.51	6.44	
AICc	4.88	5.81	57.14	20.33		
AIC	115.39	96.11	73.86	96.26		
BIC	113.81	94.16	71.99	95.3		
CV.1se	0.26	0.15	0.1	8.03	0.38	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ <i>Oracle : 76.01</i>
CV.min	5.95	2.79	0.59	28.47	4.99	
AICc	5.97	0.39	55.53	15.36		
AIC	114.85	96.86	78.52	92.57		
BIC	113.69	96.21	77.41	45.46		
CV.1se	0.3	0.05	0.03	51.64	0.44	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ <i>Oracle : 37.66</i>
CV.min	8.77	0.44	0.19	83.44	8.33	
AICc	5.87	43.26	58.6	20.88		
AIC	115.09	89.05	67.39	96.38		
BIC	114	87.23	66.38	95.79		
CV.1se	0.23	0.05	0.02	41.34	0.41	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ <i>Oracle : 37.21</i>
CV.min	6.02	0.75	0.18	76.06	5.42	
AICc	4.92	15.17	58.29	19.95		
AIC	115.57	94	72.01	96.38		
BIC	113.99	92	70.37	95.56		
CV.1se	0.13	0.1	0.03	7.66	0.35	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ <i>Oracle : 34.56</i>
CV.min	4.44	1.82	0.34	29.36	4.55	
AICc	4.79	0.18	61.89	14.63		
AIC	115.68	95.57	77.87	93.94		
BIC	114.84	94.91	76.41	53.27		
CV.1se	0.2	0.04	0.02	48.56	0.42	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ <i>Oracle : 6.81</i>
CV.min	6.36	0.35	0.18	82.92	5.52	
AICc	4.9	50.95	60.05	20.72		
AIC	115.38	84.92	65.25	96.58		
BIC	114.25	82.92	64.42	95.97		
CV.1se	0.19	0.02	0.01	38.82	0.38	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 6.7</i>
CV.min	5.61	0.41	0.16	74.96	5.09	
AICc	4.38	39.49	59.56	19.93		
AIC	115.44	89.9	68.67	96.71		
BIC	113.88	87.92	67.64	95.92		
CV.1se	0.11	0.04	0.02	7.47	0.35	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 6.45</i>
CV.min	3.86	0.96	0.22	28.61	3.4	
AICc	4.23	0.47	64.76	14.1		
AIC	116.35	91.88	75.83	94.49		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle</i> : 91.12
CV.min	12.92	0.49	0.2	85.14	12.66	
AICc	6.57	46.91	58.63	22.66		
AIC	114.72	87.92	66.31	96.21		
BIC	113.53	85.95	65.55	95.64		
CV.1se	0.13	0.03	0.02	40.77	0.45	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle</i> : 91.12
CV.min	5.82	0.73	0.16	75.21	6.34	
AICc	5.16	20.41	58.08	20.33		
AIC	115.38	92.81	70.86	96.34		
BIC	113.65	90.95	69.43	95.54		
CV.1se	0.1	0.09	0.04	7.82	0.36	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle</i> : 90.49
CV.min	4.77	1.7	0.32	29	4.33	
AICc	5.06	0.24	62.47	15.09		
AIC	115.24	94.82	77.08	93.74		
BIC	114.18	94.19	75.55	54.71		
CV.1se	0.32	0.05	0.03	50.59	0.45	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle</i> : 41.19
CV.min	8.62	0.38	0.2	83.59	9.19	
AICc	5.72	50.11	59.32	21.22		
AIC	114.97	85.8	65.3	96.45		
BIC	113.95	83.48	64.34	95.88		
CV.1se	0.19	0.03	0.01	40.32	0.36	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle</i> : 41.33
CV.min	5.87	0.44	0.16	75.03	5.34	
AICc	4.63	33.38	59.49	20.09		
AIC	115.52	90.77	69.29	96.41		
BIC	113.74	88.77	68.06	95.73		
CV.1se	0.11	0.04	0.02	7.11	0.35	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle</i> : 39.92
CV.min	3.8	1.17	0.21	28.46	3.72	
AICc	4.36	0.19	63.75	14.38		
AIC	115.83	92.95	76.28	94.55		
BIC	114.57	92.2	74.93	58.59		
CV.1se	0.17	0.04	0.02	48.98	0.41	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle</i> : 5.4
CV.min	6.19	0.27	0.17	83.35	5.93	
AICc	4.79	53.01	60.14	20.33		
AIC	115.2	81.51	64.03	96.69		
BIC	114.26	79.22	63.24	96.1		
CV.1se	0.13	0.03	0.01	38.83	0.35	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle</i> : 5.46
CV.min	5.75	0.3	0.13	74.26	5.07	
AICc	4.8	48.9	60.57	19.92		
AIC	115.71	86.57	66.78	96.49		
BIC	113.99	84.52	65.89	95.65		
CV.1se	0.09	0.02	0.01	7.04	0.35	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle</i> : 5.28
CV.min	3.32	0.77	0.18	28.68	3.24	
AICc	4.08	2.02	65.28	14.17		
AIC	116.06	89.46	74.33	94.64		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	51.8	31.21	10.08	63.72	26.46	
AICc	23.67	17.33	47.63	27.06		
AIC	107.57	95.72	73.55	83.28		
BIC	105.8	94.27	72.36	70.2		
CV.1se	13.29	9.46	3.97	37.88	9.27	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	49.64	31.3	9.03	66.79	25.74	
AICc	22.91	17.68	48.1	27.48		
AIC	108.01	96.82	74.63	84.59		
BIC	106.54	95.38	73.26	75.65		
CV.1se	12.9	9.51	3.65	37.95	9.13	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	49.97	31.29	8.63	66.12	25.43	
AICc	22.52	17.48	47.23	27.33		
AIC	108.2	97.07	75.19	84.9		
BIC	106.67	95.7	73.7	74.68		
CV.1se	2.24	1.32	0.37	44.25	1.8	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	22.92	8.52	1.58	76.86	20.44	
AICc	12.31	10.3	52.27	23.99		
AIC	112.3	97.2	75.73	92.06		
BIC	110.82	95.77	74.01	90.62		
CV.1se	1.87	0.97	0.4	45.65	1.34	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	20.75	8.04	1.29	78.54	17.03	
AICc	11.25	9.71	51.62	23.01		
AIC	112.86	98.02	76.29	92.45		
BIC	111.36	96.45	74.48	90.71		
CV.1se	2.07	0.91	0.36	43.34	1.56	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	20.36	8.18	1.35	75.11	17.3	
AICc	11.44	9.29	51.97	23.82		
AIC	112.43	98.3	76.93	92.28		
BIC	110.79	96.77	75.18	90.7		
CV.1se	0.3	0.05	0.03	48.68	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.54	1.43	0.26	81.23	7.13	
AICc	5.83	26.06	54.48	21.04		
AIC	114.97	96.18	74.3	96.04		
BIC	113.74	94.86	72.14	95.37		
CV.1se	0.18	0.07	0.03	48.41	0.53	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	7.54	1.3	0.27	82.65	6.92	
AICc	5.72	23.47	54.59	21.12		
AIC	114.94	96.9	74.9	96.2		
BIC	113.77	95.4	72.7	95.47		
CV.1se	0.46	0.08	0.05	46.13	0.56	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	7.85	1.39	0.33	80.29	7.45	
AICc	5.61	21.6	54.19	21.05		
AIC	115.04	96.82	74.9	96.08		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	56.2	31.18	8.11	68.24	43.57	
AICc	25.81	19.81	50.58	29.52		
AIC	109.45	94.74	71.57	86.29		
BIC	107.59	93.14	70.12	81.32		
CV.1se	12.85	8.14	2.13	42.89	12.2	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	52.22	29.99	6.41	72.28	42.91	
AICc	23.98	21.35	50.61	30.33		
AIC	110	95.56	72.79	88.07		
BIC	108.16	93.96	71.14	85.1		
CV.1se	12.45	7.88	1.6	43.29	11.43	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	51.72	28.89	5.45	72.13	41.13	
AICc	23.49	21.43	50.1	29.47		
AIC	109.97	95.94	73.2	88.1		
BIC	108.29	94.27	71.58	84.75		
CV.1se	1.71	0.53	0.18	46.33	1.54	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	21.83	4.96	0.88	79.69	19.74	
AICc	11.04	21.93	53.84	24.64		
AIC	113.3	95.24	72.79	93.32		
BIC	111.88	93.85	71.27	92.44		
CV.1se	1.35	0.49	0.15	48.46	1.05	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	18.23	4.31	0.76	80.96	17.35	
AICc	10.07	19.99	54.25	23.47		
AIC	113.55	96.07	74.08	93.89		
BIC	112.04	94.68	72.11	93.01		
CV.1se	1.48	0.45	0.15	46.58	1.43	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	18.38	4.3	0.72	78.04	16.64	
AICc	9.91	18.8	53.45	23.86		
AIC	113.5	96.56	74.22	93.69		
BIC	112.07	94.87	72.43	92.51		
CV.1se	0.19	0.05	0.03	48.89	0.49	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.2	0.78	0.22	82.38	7.36	
AICc	5.69	41.34	56.18	20.81		
AIC	115.05	93.33	71.05	96.19		
BIC	113.79	91.61	69.48	95.57		
CV.1se	0.15	0.09	0.03	48.92	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	6.87	0.75	0.22	83.16	6.76	
AICc	5.32	39.19	56.2	20.6		
AIC	115.1	93.86	71.59	96.49		
BIC	113.89	92.23	69.58	95.72		
CV.1se	0.35	0.08	0.03	47.2	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	7.52	0.85	0.23	81.11	7.4	
AICc	5.54	39.18	55.9	21.08		
AIC	115.04	94.12	71.57	96.28		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	56.12	30.29	7.09	68.19	43.91	
AICc	25.92	20.1	50.87	29.8		
AIC	109.5	94.17	71.06	86.42		
BIC	107.71	92.58	69.35	81.31		
CV.1se	12.66	7.82	1.83	43.08	12.63	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	51.74	29.5	5.79	72.42	45.16	
AICc	23.93	21.36	51.14	30.35		
AIC	110.06	95.36	72.61	88.21		
BIC	108.22	93.81	71.01	85.14		
CV.1se	12.13	7.54	1.57	43.65	11.08	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	51.24	27.8	5.46	72.44	42.37	
AICc	23.51	22.16	50.82	29.91		
AIC	109.96	95.43	72.92	88.15		
BIC	108.27	93.79	71.36	84.83		
CV.1se	1.67	0.54	0.17	46.44	1.52	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	21.94	4.62	0.85	79.58	19.81	
AICc	11.21	25.15	54.4	24.47		
AIC	113.21	94.98	72.58	93.3		
BIC	111.84	93.46	70.87	92.48		
CV.1se	1.31	0.46	0.16	48.53	1.11	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	17.75	3.93	0.74	81.02	17.72	
AICc	9.99	22.08	53.71	23.21		
AIC	113.45	95.41	73.3	93.87		
BIC	112.21	93.9	71.58	93.07		
CV.1se	1.48	0.44	0.15	46.94	1.36	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	18.39	4.36	0.68	78.06	16.65	
AICc	9.9	20.73	54.31	23.77		
AIC	113.62	95.86	73.83	93.83		
BIC	111.78	94.25	72.08	92.75		
CV.1se	0.2	0.05	0.03	48.94	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.25	0.85	0.24	82.54	7.42	
AICc	5.58	42.66	56.7	20.93		
AIC	115.13	92.77	70.27	96.11		
BIC	113.8	91.17	68.87	95.44		
CV.1se	0.13	0.06	0.03	48.89	0.47	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	7.36	0.71	0.23	82.88	6.72	
AICc	5.47	40.99	56.27	20.73		
AIC	115.14	93.36	71.01	96.47		
BIC	114.08	91.68	69.34	95.79		
CV.1se	0.31	0.06	0.03	46.93	0.54	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	7.5	0.77	0.22	80.97	7.4	
AICc	5.59	40.25	56.13	21.02		
AIC	115.22	93.28	71.09	96.18		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	56.43	30.25	7.22	68.21	44.62	
AICc	25.96	20.19	50.51	30.09		
AIC	109.46	94.02	70.89	86.51		
BIC	107.7	92.34	69.24	81.5		
CV.1se	12.64	7.58	1.76	43.12	12.52	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	51.72	28.7	5.71	72.35	45.49	
AICc	24.19	21.69	51.09	30.58		
AIC	109.97	95.16	72.22	88.27		
BIC	108.2	93.63	70.63	85.32		
CV.1se	12.47	7.56	1.56	43.72	11.49	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	52.07	28.03	5.1	72.34	43.41	
AICc	23.59	22.25	51.31	29.76		
AIC	110.06	95.27	72.43	88.19		
BIC	108.38	93.75	70.8	85.2		
CV.1se	1.67	0.58	0.17	46.52	1.53	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	21.53	4.46	0.88	79.52	19.68	
AICc	11.19	26.01	54.39	24.47		
AIC	113.26	94.75	72.32	93.32		
BIC	111.88	92.98	70.66	92.52		
CV.1se	1.39	0.49	0.14	48.48	1.08	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	17.82	3.67	0.7	80.79	16.98	
AICc	9.77	23.42	53.92	23.32		
AIC	113.55	95.31	73.21	93.9		
BIC	112.09	93.71	71.35	93.02		
CV.1se	1.49	0.47	0.17	47.01	1.38	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	18.57	3.81	0.71	78.45	16.48	
AICc	9.44	22.28	54.36	24.04		
AIC	113.62	95.64	73.58	93.83		
BIC	112.03	93.96	72.05	92.8		
CV.1se	0.18	0.05	0.04	49.01	0.5	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.3	0.76	0.22	82.27	7.55	
AICc	5.68	42.76	56.51	20.96		
AIC	115.05	92.49	70.28	96.17		
BIC	113.84	90.98	68.77	95.54		
CV.1se	0.13	0.06	0.02	49.06	0.49	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	7.18	0.72	0.22	82.87	6.86	
AICc	5.32	41.42	56.52	20.47		
AIC	115.25	93.32	70.79	96.45		
BIC	113.97	91.47	69.17	95.78		
CV.1se	0.32	0.09	0.02	47.14	0.5	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	7.87	0.81	0.21	81.23	7.48	
AICc	5.56	41.04	56.52	21.18		
AIC	115.32	93.22	70.92	96.26		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	48.76	30.49	9.09	62.24	25.12	
AICc	23.63	12.69	40.4	27.3		
AIC	107.21	95.86	73.11	82.84		
BIC	105.59	94.62	71.98	68.72		
CV.1se	1.85	2.03	0.98	34.6	2.43	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	18.64	13.43	2.57	67.88	10.97	
AICc	11.48	3.33	32.98	21.77		
AIC	108.62	99.01	78.58	86.94		
BIC	107.48	98.11	77.47	69.36		
CV.1se	1.87	1.57	1.21	14.26	1.38	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	12.42	8.94	2.65	35.64	4.83	
AICc	9.63	2.13	1.09	20.56		
AIC	103.72	94.2	74.92	59.68		
BIC	96.42	91.4	74.17	4.16		
CV.1se	2.32	1.23	0.47	42.95	1.56	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	21.01	7.68	1.51	75.87	17.68	
AICc	12.34	2.64	52.92	22.95		
AIC	112.42	97.36	75.51	91.96		
BIC	110.69	96.1	73.51	89.39		
CV.1se	0.65	0.47	0.24	37.69	0.66	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	10.16	4.68	1	71.7	7.12	
AICc	7.91	1.19	49.4	20.47		
AIC	112.63	100.66	80.45	92.43		
BIC	110.97	99.28	79.02	88.18		
CV.1se	1.08	1.02	0.88	8.06	0.92	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	9.12	6.35	1.86	27.66	4.02	
AICc	8.21	1.51	1.5	14.76		
AIC	108.8	96.79	77.68	77.15		
BIC	107.12	96.28	76.8	6.57		
CV.1se	0.43	0.1	0.04	47.17	0.53	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.26	1.51	0.35	81.57	7.12	
AICc	6.04	5.46	56.14	20.48		
AIC	114.91	96.23	74.15	96.17		
BIC	113.8	95.08	71.87	95.47		
CV.1se	0.19	0.1	0.03	40.1	0.4	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	6.2	1.96	0.33	73.69	5.92	
AICc	5.5	0.51	54.56	19.49		
AIC	115.31	99.61	78.56	95.89		
BIC	113.74	98.17	76.53	94.87		
CV.1se	0.27	0.21	0.13	8.65	0.47	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	6.07	3.78	0.76	29.34	4.84	
AICc	6.02	0.53	39.04	15.1		
AIC	114.26	98.77	79.84	91.25		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	52.29	29.7	7.84	65.99	41.23	
AICc	25.49	14.18	48.45	29.4		
AIC	108.91	94.44	71.11	85.89		
BIC	107.15	93.03	69.96	79.75		
CV.1se	1.13	0.83	0.32	38.6	1.18	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	15.96	7.85	1.36	71.45	12.66	
AICc	10.31	2.05	51.43	22.39		
AIC	111.75	99.46	78.84	91.86		
BIC	110.21	98.12	77.3	88.77		
CV.1se	2.94	2.39	1.55	11.52	1.8	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	17.32	11.96	3.39	31.45	5.82	
AICc	12.15	2.92	4.24	17.22		
AIC	110.52	98.92	79.39	82.52		
BIC	109.06	98.51	78.52	16.99		
CV.1se	1.89	0.68	0.22	45.26	1.47	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	20.44	4.87	1	77.64	19.27	
AICc	11.4	3.98	55.05	23.7		
AIC	112.93	95.4	72.56	93.21		
BIC	111.49	93.86	71.14	92.01		
CV.1se	0.47	0.15	0.09	40.29	0.5	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	8.63	3.06	0.5	73.88	8.11	
AICc	6.57	1.17	53.49	20.6		
AIC	114.17	99.81	78.69	94.66		
BIC	112.51	98.2	76.7	92.95		
CV.1se	0.92	0.75	0.43	10.91	0.9	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	10.64	7.1	1.62	31.65	6.78	
AICc	8.71	1.03	22.63	16.97		
AIC	113.45	99.75	80.37	89.73		
BIC	112.3	99.31	79.27	36.91		
CV.1se	0.45	0.08	0.04	47.64	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.27	1.09	0.24	83.01	6.88	
AICc	5.88	21.4	57.22	20.57		
AIC	115.22	93.22	70.71	96.37		
BIC	113.89	91.61	69.19	95.75		
CV.1se	0.16	0.05	0.01	40.62	0.38	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	5.75	1.27	0.24	74.63	5.47	
AICc	4.8	2.44	56.44	19.2		
AIC	115.48	97.16	75.46	96.22		
BIC	113.75	95.41	73.34	95.56		
CV.1se	0.23	0.1	0.04	9.17	0.41	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	5.11	2.47	0.36	30.21	4.47	
AICc	4.77	0.2	59.58	14.71		
AIC	115.51	97.78	79.39	93.86		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	52.74	28.67	7.57	66.14	40.88	
AICc	25.79	14.25	49.58	29.74		
AIC	109.07	94.06	70.86	85.87		
BIC	107.23	92.67	69.57	80.39		
CV.1se	1.15	0.8	0.29	38.82	1.13	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	15.67	7.55	1.3	71.88	12.83	
AICc	9.99	2.09	51.75	22.65		
AIC	111.92	99.41	78.36	92.07		
BIC	110.3	97.87	76.79	88.34		
CV.1se	3.02	2.37	1.53	11.41	1.84	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	17.58	11.65	3.21	30.64	6.05	
AICc	12.44	2.96	4.2	17.48		
AIC	111.28	99.27	79.3	84.13		
BIC	110.01	98.5	78.44	19.56		
CV.1se	1.85	0.68	0.25	45.32	1.5	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	20.34	4.69	0.94	77.91	19.42	
AICc	11.35	4.96	55.5	23.71		
AIC	112.88	94.53	72.26	93.26		
BIC	111.39	93.22	70.86	92.15		
CV.1se	0.49	0.15	0.09	40.63	0.55	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	8.72	2.83	0.49	74.05	7.92	
AICc	6.7	1.08	54.75	20.91		
AIC	114.18	99.19	78.32	94.66		
BIC	112.37	97.6	76.47	93.35		
CV.1se	0.93	0.75	0.41	11.31	0.92	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	10.6	6.93	1.59	31.92	6.93	
AICc	8.87	1	28.15	17.33		
AIC	113.67	99.58	80.42	90.31		
BIC	112.6	98.96	79.3	38.44		
CV.1se	0.39	0.09	0.03	47.88	0.51	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.02	0.94	0.22	83.05	6.92	
AICc	6.03	23.93	58.01	20.39		
AIC	115.14	92.72	70.33	96.45		
BIC	113.9	91.32	68.77	95.84		
CV.1se	0.15	0.05	0.01	40.56	0.39	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	5.64	1.13	0.24	74.59	5.6	
AICc	4.77	3.34	56.58	18.98		
AIC	115.38	96.69	74.79	96.22		
BIC	113.88	95.01	72.91	95.49		
CV.1se	0.22	0.09	0.05	9.07	0.39	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	4.92	2.39	0.35	30.14	4.48	
AICc	4.99	0.18	60.35	14.89		
AIC	115.45	97.52	79.08	94.04		
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	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	52.82	28.65	7.41	66.02	41.77	
AICc	25.42	14.14	50.04	29.98		
AIC	109.08	93.8	70.69	85.97		
BIC	107.32	92.37	69.39	80.36		
CV.1se	1.17	0.96	0.3	38.95	1.11	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	15.91	7.53	1.25	71.91	12.68	
AICc	10.01	1.97	50.99	22.59		
AIC	111.92	99.13	78.16	92.24		
BIC	110.31	97.63	76.44	88.11		
CV.1se	3.06	2.36	1.54	11.34	1.82	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	17.76	11.56	3.37	30.47	6.11	
AICc	12.36	2.97	5.95	17.28		
AIC	111.5	99.3	79.39	84.64		
BIC	110.17	98.8	78.55	21.46		
CV.1se	1.82	0.61	0.24	45.25	1.42	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	20.17	4.57	1.05	77.66	19.06	
AICc	11.37	5.38	55.83	23.62		
AIC	112.97	94.51	71.98	93.3		
BIC	111.61	93.11	70.39	91.94		
CV.1se	0.45	0.14	0.09	40.74	0.56	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	8.58	2.68	0.51	74.03	7.9	
AICc	6.68	1.07	54.68	20.64		
AIC	114.12	99.09	78	94.62		
BIC	112.63	97.48	75.92	93.32		
CV.1se	0.95	0.75	0.38	11.42	0.88	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	10.38	6.89	1.56	31.8	6.94	
AICc	8.91	0.97	29.77	17.51		
AIC	113.75	99.3	80.23	90.54		
BIC	112.62	98.61	78.95	40.24		
CV.1se	0.4	0.09	0.03	47.72	0.52	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ <i>Oracle : 10</i>
CV.min	7.16	0.87	0.23	83.11	6.8	
AICc	5.98	25.61	57.58	20.44		
AIC	115.19	92.21	69.93	96.41		
BIC	114	90.72	68.56	95.8		
CV.1se	0.14	0.05	0.02	40.55	0.38	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ <i>Oracle : 10</i>
CV.min	5.73	1.12	0.24	74.35	5.55	
AICc	4.63	3.95	56.76	19.17		
AIC	115.4	96.71	74.93	96.33		
BIC	113.69	95.06	72.93	95.62		
CV.1se	0.23	0.09	0.04	9.02	0.38	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ <i>Oracle : 10</i>
CV.min	4.93	2.29	0.36	30.16	4.45	
AICc	4.92	0.19	60.41	14.85		
AIC	115.49	97.2	79.11	94.12		
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.lse	0.36	0.74	0.20	0.71	0.01	0.60	0.23	0.65	0.01	0.57	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 33.3$
CV.min	0.72	0.85	0.64	0.82	0.22	0.73	0.54	0.72	0.20	0.71	
AICc	0.70	0.84	0.63	0.82	0.36	0.76	0.52	0.72			
AIC	0.95	0.95	0.95	0.95	0.95	0.94	0.53	0.72			
BIC	0.22	0.71	0.14	0.69	0.01	0.61	0.17	0.63			
CV.lse	0.41	0.74	0.25	0.71	0.02	0.60	0.28	0.65	0.01	0.57	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 33.3$
CV.min	0.74	0.84	0.66	0.82	0.25	0.72	0.56	0.72	0.21	0.71	
AICc	0.72	0.84	0.65	0.82	0.39	0.77	0.54	0.71			
AIC	0.95	0.96	0.95	0.95	0.95	0.94	0.55	0.71			
BIC	0.24	0.70	0.15	0.68	0.01	0.60	0.20	0.62			
CV.lse	0.45	0.74	0.28	0.71	0.03	0.60	0.30	0.64	0.01	0.58	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 33.1$
CV.min	0.75	0.84	0.68	0.82	0.28	0.72	0.57	0.71	0.23	0.71	
AICc	0.73	0.83	0.66	0.81	0.40	0.76	0.55	0.70			
AIC	0.95	0.96	0.95	0.96	0.95	0.94	0.56	0.71			
BIC	0.27	0.69	0.17	0.68	0.02	0.60	0.22	0.61			
CV.lse	0.27	0.64	0.13	0.59	0.01	0.47	0.45	0.67	0.01	0.46	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 26.3$
CV.min	0.72	0.79	0.61	0.76	0.14	0.61	0.81	0.81	0.26	0.65	
AICc	0.72	0.79	0.63	0.77	0.34	0.67	0.77	0.79			
AIC	0.97	0.95	0.97	0.95	0.97	0.93	0.85	0.83			
BIC	0.19	0.61	0.10	0.58	0.00	0.45	0.16	0.57			
CV.lse	0.31	0.62	0.16	0.58	0.01	0.47	0.50	0.67	0.01	0.46	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 26.4$
CV.min	0.74	0.78	0.64	0.74	0.15	0.60	0.82	0.80	0.24	0.62	
AICc	0.73	0.78	0.65	0.75	0.37	0.67	0.78	0.77			
AIC	0.97	0.95	0.97	0.95	0.96	0.93	0.86	0.82			
BIC	0.21	0.59	0.12	0.56	0.01	0.45	0.19	0.56			
CV.lse	0.35	0.63	0.19	0.58	0.02	0.47	0.51	0.66	0.01	0.46	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 26.1$
CV.min	0.75	0.79	0.66	0.75	0.18	0.60	0.81	0.79	0.27	0.63	
AICc	0.74	0.79	0.67	0.76	0.39	0.68	0.79	0.77			
AIC	0.97	0.95	0.97	0.95	0.96	0.93	0.85	0.82			
BIC	0.23	0.59	0.13	0.56	0.01	0.45	0.21	0.56			
CV.lse	0.12	0.38	0.06	0.34	0.01	0.26	0.62	0.62	0.01	0.27	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 19.7$
CV.min	0.70	0.66	0.54	0.59	0.14	0.43	0.88	0.79	0.38	0.53	
AICc	0.73	0.69	0.60	0.63	0.22	0.43	0.85	0.76			
AIC	0.98	0.94	0.98	0.94	0.98	0.91	0.94	0.88			
BIC	0.13	0.40	0.06	0.36	0.00	0.18	0.17	0.44			
CV.lse	0.14	0.36	0.08	0.33	0.01	0.26	0.66	0.62	0.01	0.26	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 19.4$
CV.min	0.72	0.66	0.59	0.59	0.14	0.42	0.89	0.79	0.36	0.51	
AICc	0.75	0.68	0.64	0.63	0.26	0.45	0.85	0.75			
AIC	0.98	0.95	0.98	0.94	0.98	0.92	0.95	0.88			
BIC	0.13	0.37	0.07	0.34	0.00	0.18	0.19	0.41			
CV.lse	0.16	0.36	0.09	0.32	0.02	0.24	0.65	0.60	0.02	0.26	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 19.7$
CV.min	0.74	0.65	0.61	0.58	0.16	0.40	0.89	0.77	0.37	0.50	
AICc	0.76	0.66	0.66	0.62	0.28	0.44	0.86	0.73			
AIC	0.98	0.95	0.98	0.94	0.98	0.92	0.94	0.86			
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.lse	0.49	0.76	0.36	0.71	0.07	0.56	0.43	0.66	0.15	0.61	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 124.2$
CV.min	0.64	0.83	0.56	0.80	0.19	0.65	0.57	0.74	0.39	0.74	
AICc	0.55	0.79	0.48	0.77	0.43	0.75	0.53	0.71			
AIC	0.84	0.94	0.84	0.94	0.84	0.91	0.63	0.77			
BIC	0.22	0.59	0.13	0.56	0.02	0.47	0.22	0.54			
CV.lse	0.52	0.76	0.39	0.71	0.08	0.56	0.47	0.66	0.13	0.60	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 123.8$
CV.min	0.66	0.84	0.58	0.80	0.21	0.65	0.59	0.73	0.38	0.73	
AICc	0.57	0.78	0.50	0.77	0.44	0.76	0.55	0.71			
AIC	0.84	0.94	0.84	0.94	0.84	0.92	0.65	0.77			
BIC	0.23	0.57	0.15	0.55	0.02	0.47	0.25	0.53			
CV.lse	0.54	0.76	0.41	0.71	0.10	0.56	0.48	0.65	0.16	0.60	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 123.6$
CV.min	0.67	0.84	0.59	0.80	0.24	0.65	0.60	0.73	0.39	0.73	
AICc	0.58	0.78	0.51	0.77	0.45	0.75	0.56	0.70			
AIC	0.84	0.94	0.84	0.94	0.84	0.91	0.65	0.76			
BIC	0.25	0.56	0.16	0.55	0.03	0.47	0.27	0.52			
CV.lse	0.43	0.58	0.27	0.50	0.07	0.34	0.52	0.62	0.26	0.50	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 90.2$
CV.min	0.66	0.73	0.54	0.66	0.20	0.46	0.68	0.73	0.57	0.68	
AICc	0.60	0.69	0.55	0.67	0.62	0.69	0.62	0.69			
AIC	0.90	0.94	0.90	0.92	0.90	0.90	0.79	0.82			
BIC	0.08	0.24	0.06	0.29	0.01	0.12	0.17	0.38			
CV.lse	0.46	0.57	0.31	0.49	0.08	0.34	0.55	0.61	0.23	0.46	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 90.2$
CV.min	0.67	0.73	0.56	0.66	0.21	0.46	0.69	0.72	0.55	0.66	
AICc	0.61	0.68	0.56	0.66	0.62	0.69	0.64	0.68			
AIC	0.90	0.94	0.90	0.93	0.90	0.90	0.80	0.82			
BIC	0.06	0.17	0.07	0.26	0.01	0.12	0.18	0.35			
CV.lse	0.48	0.57	0.34	0.50	0.10	0.33	0.56	0.61	0.26	0.47	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 89.2$
CV.min	0.68	0.73	0.58	0.67	0.24	0.46	0.69	0.71	0.56	0.66	
AICc	0.62	0.69	0.57	0.67	0.63	0.69	0.65	0.68			
AIC	0.90	0.94	0.90	0.93	0.90	0.90	0.80	0.81			
BIC	0.06	0.16	0.08	0.24	0.01	0.10	0.20	0.34			
CV.lse	0.08	0.06	0.03	0.02	0.00	0.01	0.65	0.44	0.09	0.04	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 56.2$
CV.min	0.61	0.41	0.34	0.21	0.07	0.05	0.80	0.64	0.59	0.40	
AICc	0.64	0.43	0.63	0.43	0.23	0.16	0.76	0.57			
AIC	0.94	0.92	0.94	0.90	0.94	0.90	0.90	0.81			
BIC	0.01	0.01	0.00	0.01	0.00	0.00	0.06	0.04			
CV.lse	0.07	0.04	0.03	0.02	0.00	0.00	0.67	0.42	0.08	0.03	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 56.2$
CV.min	0.60	0.36	0.34	0.19	0.08	0.04	0.81	0.61	0.57	0.35	
AICc	0.64	0.39	0.63	0.41	0.29	0.20	0.77	0.55			
AIC	0.94	0.92	0.94	0.91	0.94	0.90	0.90	0.81			
BIC	0.01	0.01	0.01	0.01	0.00	0.00	0.06	0.03			
CV.lse	0.07	0.03	0.03	0.01	0.00	0.00	0.67	0.41	0.07	0.03	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 56.5$
CV.min	0.61	0.36	0.37	0.18	0.09	0.04	0.81	0.60	0.58	0.34	
AICc	0.66	0.40	0.64	0.41	0.27	0.19	0.77	0.54			
AIC	0.94	0.92	0.94	0.91	0.94	0.90	0.90	0.80			
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.lse	0.47	0.74	0.36	0.68	0.15	0.52	0.41	0.64	0.38	0.70	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 208.7$
CV.min	0.58	0.82	0.50	0.78	0.26	0.62	0.51	0.71	0.54	0.80	
AICc	0.46	0.73	0.41	0.71	0.41	0.71	0.45	0.67			
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			
CV.lse	0.49	0.74	0.39	0.68	0.16	0.52	0.44	0.63	0.36	0.68	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 208.8$
CV.min	0.59	0.82	0.52	0.78	0.27	0.62	0.52	0.71	0.52	0.79	
AICc	0.48	0.72	0.42	0.71	0.40	0.71	0.47	0.66			
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			
CV.lse	0.50	0.74	0.40	0.68	0.18	0.52	0.44	0.62	0.38	0.68	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 209.4$
CV.min	0.60	0.82	0.52	0.78	0.29	0.62	0.53	0.70	0.53	0.79	
AICc	0.48	0.72	0.43	0.71	0.41	0.70	0.47	0.65			
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			
CV.lse	0.41	0.47	0.25	0.33	0.06	0.10	0.51	0.56	0.40	0.47	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 143.3$
CV.min	0.60	0.67	0.47	0.54	0.18	0.24	0.62	0.67	0.60	0.67	
AICc	0.53	0.59	0.51	0.58	0.61	0.61	0.56	0.61			
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			
CV.lse	0.42	0.45	0.27	0.32	0.06	0.09	0.53	0.54	0.41	0.44	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 144.0$
CV.min	0.62	0.66	0.49	0.54	0.17	0.22	0.63	0.66	0.61	0.66	
AICc	0.54	0.57	0.52	0.57	0.61	0.61	0.58	0.60			
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			
CV.lse	0.44	0.45	0.30	0.32	0.06	0.07	0.54	0.53	0.42	0.43	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 143.6$
CV.min	0.62	0.66	0.51	0.54	0.19	0.22	0.63	0.65	0.62	0.66	
AICc	0.55	0.56	0.53	0.57	0.61	0.61	0.59	0.59			
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			
CV.lse	0.04	0.01	0.01	0.00	0.00	0.00	0.67	0.33	0.14	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 77.9$
CV.min	0.54	0.23	0.20	0.05	0.06	0.01	0.79	0.53	0.54	0.23	
AICc	0.60	0.27	0.64	0.33	0.15	0.09	0.75	0.44			
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			
CV.lse	0.03	0.01	0.00	0.00	0.00	0.00	0.68	0.31	0.15	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 78.0$
CV.min	0.51	0.18	0.19	0.04	0.06	0.01	0.80	0.51	0.51	0.17	
AICc	0.59	0.23	0.61	0.30	0.17	0.10	0.76	0.43			
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			
CV.lse	0.02	0.01	0.01	0.00	0.00	0.00	0.69	0.29	0.14	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 77.5$
CV.min	0.50	0.17	0.19	0.04	0.07	0.01	0.80	0.49	0.52	0.17	
AICc	0.60	0.23	0.62	0.29	0.16	0.09	0.76	0.41			
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			

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.lse	0.44	0.72	0.35	0.62	0.22	0.39	0.39	0.62	0.46	0.75	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 293.1$
CV.min	0.53	0.82	0.46	0.75	0.33	0.55	0.46	0.70	0.55	0.84	
AICc	0.39	0.65	0.37	0.64	0.42	0.66	0.39	0.62			
AIC	0.67	0.93	0.67	0.92	0.67	0.88	0.52	0.77			
BIC	0.00	0.00	0.00	0.01	0.13	0.23	0.03	0.04			
CV.lse	0.45	0.71	0.37	0.61	0.22	0.38	0.41	0.60	0.46	0.74	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 293.7$
CV.min	0.54	0.82	0.47	0.75	0.33	0.54	0.47	0.69	0.55	0.84	
AICc	0.40	0.63	0.38	0.64	0.42	0.66	0.41	0.61			
AIC	0.67	0.93	0.67	0.92	0.67	0.89	0.53	0.76			
BIC	0.00	0.00	0.00	0.00	0.11	0.19	0.02	0.03			
CV.lse	0.46	0.72	0.38	0.61	0.23	0.36	0.41	0.59	0.47	0.74	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 293.3$
CV.min	0.54	0.82	0.47	0.75	0.34	0.54	0.47	0.68	0.56	0.84	
AICc	0.40	0.63	0.38	0.63	0.42	0.66	0.41	0.59			
AIC	0.67	0.93	0.67	0.92	0.67	0.89	0.53	0.76			
BIC	0.00	0.00	0.00	0.00	0.11	0.17	0.02	0.02			
CV.lse	0.35	0.28	0.12	0.08	0.00	0.00	0.48	0.44	0.36	0.29	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 217.0$
CV.min	0.54	0.54	0.34	0.28	0.05	0.02	0.56	0.57	0.55	0.55	
AICc	0.46	0.41	0.49	0.45	0.60	0.51	0.51	0.48			
AIC	0.77	0.91	0.77	0.89	0.78	0.88	0.68	0.75			
BIC	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01			
CV.lse	0.33	0.23	0.09	0.05	0.00	0.00	0.50	0.43	0.34	0.24	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 214.8$
CV.min	0.55	0.52	0.33	0.23	0.04	0.01	0.58	0.56	0.55	0.52	
AICc	0.47	0.38	0.50	0.44	0.60	0.52	0.52	0.47			
AIC	0.77	0.91	0.77	0.89	0.78	0.88	0.69	0.75			
BIC	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01			
CV.lse	0.34	0.22	0.10	0.05	0.00	0.00	0.51	0.42	0.35	0.23	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 215.0$
CV.min	0.55	0.51	0.35	0.24	0.04	0.01	0.58	0.55	0.55	0.52	
AICc	0.48	0.38	0.51	0.43	0.60	0.51	0.53	0.46			
AIC	0.77	0.91	0.77	0.89	0.78	0.88	0.69	0.74			
BIC	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01			
CV.lse	0.03	0.00	0.00	0.00	0.00	0.00	0.72	0.24	0.22	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 90.7$
CV.min	0.51	0.12	0.16	0.01	0.07	0.00	0.81	0.43	0.54	0.12	
AICc	0.61	0.15	0.68	0.27	0.07	0.04	0.78	0.35			
AIC	0.91	0.91	0.91	0.89	0.91	0.91	0.88	0.71			
BIC	0.01	0.00	0.00	0.00	0.02	0.02	0.09	0.00			
CV.lse	0.02	0.00	0.00	0.00	0.00	0.00	0.73	0.23	0.24	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 91.4$
CV.min	0.47	0.09	0.15	0.01	0.07	0.00	0.81	0.41	0.52	0.09	
AICc	0.59	0.12	0.65	0.24	0.07	0.04	0.78	0.33			
AIC	0.91	0.91	0.91	0.89	0.91	0.91	0.88	0.71			
BIC	0.01	0.00	0.00	0.00	0.01	0.01	0.07	0.00			
CV.lse	0.01	0.00	0.00	0.00	0.00	0.00	0.72	0.21	0.24	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 89.5$
CV.min	0.47	0.09	0.16	0.01	0.06	0.00	0.81	0.40	0.51	0.08	
AICc	0.58	0.12	0.65	0.24	0.07	0.04	0.79	0.32			
AIC	0.91	0.90	0.91	0.89	0.91	0.90	0.88	0.71			
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.lse	0.36	0.74	0.21	0.71	0.02	0.60	0.24	0.65	0.00	0.57	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 33.2$
CV.min	0.72	0.85	0.64	0.83	0.22	0.72	0.55	0.73	0.20	0.71	
AICc	0.70	0.84	0.60	0.82	0.10	0.67	0.52	0.72			
AIC	0.95	0.95	0.95	0.95	0.95	0.94	0.53	0.72			
BIC	0.22	0.70	0.12	0.68	0.00	0.57	0.18	0.63			
CV.lse	0.72	0.70	0.61	0.66	0.17	0.56	0.51	0.51	0.04	0.55	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 32.9$
CV.min	0.85	0.81	0.81	0.77	0.53	0.67	0.60	0.55	0.25	0.63	
AICc	0.82	0.78	0.78	0.75	0.44	0.65	0.60	0.55			
AIC	0.94	0.95	0.94	0.95	0.94	0.94	0.60	0.55			
BIC	0.49	0.59	0.36	0.57	0.05	0.49	0.49	0.51			
CV.lse	0.87	0.65	0.85	0.60	0.73	0.50	0.04	0.37	0.48	0.50	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 30.4$
CV.min	0.90	0.76	0.89	0.73	0.81	0.60	0.06	0.39	0.66	0.57	
AICc	0.89	0.72	0.87	0.68	0.78	0.57	0.06	0.39			
AIC	0.90	0.79	0.90	0.79	0.88	0.77	0.06	0.39			
BIC	0.80	0.43	0.78	0.40	0.49	0.31	0.06	0.39			
CV.lse	0.27	0.64	0.13	0.59	0.01	0.48	0.47	0.68	0.01	0.47	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 26.2$
CV.min	0.72	0.79	0.61	0.76	0.15	0.61	0.81	0.81	0.26	0.65	
AICc	0.72	0.79	0.57	0.75	0.03	0.52	0.77	0.79			
AIC	0.97	0.95	0.97	0.95	0.97	0.93	0.85	0.83			
BIC	0.19	0.61	0.07	0.57	0.00	0.40	0.16	0.58			
CV.lse	0.66	0.55	0.53	0.51	0.12	0.42	0.76	0.57	0.07	0.44	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 25.8$
CV.min	0.85	0.72	0.81	0.68	0.43	0.54	0.86	0.67	0.33	0.55	
AICc	0.84	0.70	0.79	0.66	0.31	0.51	0.85	0.65			
AIC	0.96	0.96	0.96	0.95	0.96	0.94	0.87	0.67			
BIC	0.41	0.44	0.29	0.41	0.02	0.32	0.51	0.43			
CV.lse	0.68	0.31	0.80	0.34	0.77	0.33	0.32	0.44	0.61	0.35	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 23.3$
CV.min	0.90	0.59	0.90	0.56	0.84	0.45	0.53	0.54	0.76	0.45	
AICc	0.91	0.56	0.89	0.51	0.77	0.39	0.53	0.54			
AIC	0.95	0.86	0.95	0.88	0.94	0.88	0.53	0.54			
BIC	0.08	0.05	0.01	0.04	0.01	0.05	0.34	0.45			
CV.lse	0.12	0.38	0.06	0.34	0.01	0.26	0.63	0.64	0.01	0.27	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 19.2$
CV.min	0.70	0.67	0.55	0.60	0.14	0.43	0.89	0.81	0.37	0.54	
AICc	0.73	0.69	0.43	0.57	0.01	0.22	0.85	0.77			
AIC	0.98	0.95	0.98	0.94	0.98	0.91	0.94	0.88			
BIC	0.13	0.41	0.03	0.33	0.00	0.09	0.17	0.44			
CV.lse	0.16	0.11	0.19	0.15	0.07	0.14	0.80	0.42	0.10	0.22	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 19.0$
CV.min	0.81	0.46	0.78	0.44	0.35	0.30	0.92	0.61	0.44	0.37	
AICc	0.84	0.50	0.71	0.41	0.04	0.13	0.90	0.57			
AIC	0.98	0.95	0.98	0.95	0.98	0.93	0.94	0.74			
BIC	0.10	0.11	0.04	0.09	0.00	0.05	0.17	0.12			
CV.lse	0.00	0.07	0.00	0.07	0.00	0.07	0.45	0.28	0.01	0.07	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 16.4$
CV.min	0.57	0.09	0.45	0.08	0.16	0.07	0.82	0.64	0.35	0.12	
AICc	0.70	0.10	0.20	0.07	0.00	0.07	0.81	0.64			
AIC	0.96	0.86	0.97	0.90	0.97	0.88	0.83	0.68			
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.lse	0.50	0.76	0.36	0.71	0.07	0.56	0.44	0.67	0.15	0.62	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 122.8$
CV.min	0.65	0.84	0.56	0.81	0.19	0.65	0.58	0.74	0.39	0.74	
AICc	0.55	0.79	0.47	0.77	0.29	0.70	0.53	0.72			
AIC	0.84	0.94	0.84	0.94	0.84	0.91	0.63	0.77			
BIC	0.21	0.59	0.11	0.55	0.01	0.43	0.22	0.55			
CV.lse	0.68	0.74	0.62	0.70	0.33	0.56	0.65	0.58	0.24	0.55	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 122.5$
CV.min	0.74	0.84	0.70	0.80	0.47	0.66	0.69	0.65	0.42	0.64	
AICc	0.68	0.74	0.63	0.72	0.48	0.68	0.67	0.62			
AIC	0.84	0.95	0.84	0.94	0.83	0.93	0.70	0.67			
BIC	0.25	0.23	0.35	0.39	0.15	0.41	0.46	0.35			
CV.lse	0.74	0.74	0.71	0.70	0.60	0.58	0.56	0.17	0.54	0.54	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 119.5$
CV.min	0.77	0.83	0.75	0.80	0.64	0.67	0.61	0.21	0.59	0.61	
AICc	0.73	0.72	0.71	0.70	0.62	0.65	0.61	0.20			
AIC	0.77	0.83	0.77	0.84	0.74	0.84	0.61	0.21			
BIC	0.05	0.01	0.01	0.01	0.00	0.01	0.47	0.14			
CV.lse	0.43	0.58	0.27	0.50	0.07	0.33	0.52	0.62	0.26	0.49	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 90.2$
CV.min	0.66	0.73	0.54	0.66	0.19	0.45	0.68	0.73	0.57	0.68	
AICc	0.60	0.69	0.50	0.65	0.32	0.51	0.62	0.69			
AIC	0.90	0.93	0.90	0.92	0.90	0.90	0.79	0.82			
BIC	0.07	0.24	0.03	0.23	0.00	0.01	0.17	0.38			
CV.lse	0.62	0.41	0.60	0.41	0.33	0.28	0.71	0.48	0.38	0.37	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 89.7$
CV.min	0.76	0.66	0.72	0.62	0.48	0.42	0.77	0.60	0.54	0.49	
AICc	0.72	0.57	0.69	0.57	0.59	0.56	0.75	0.55			
AIC	0.90	0.95	0.90	0.94	0.90	0.92	0.82	0.75			
BIC	0.01	0.01	0.00	0.01	0.00	0.00	0.09	0.04			
CV.lse	0.06	0.04	0.18	0.10	0.18	0.10	0.65	0.18	0.61	0.30	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 86.2$
CV.min	0.59	0.20	0.63	0.35	0.43	0.24	0.73	0.29	0.72	0.43	
AICc	0.67	0.16	0.32	0.14	0.21	0.16	0.73	0.28			
AIC	0.87	0.88	0.86	0.88	0.86	0.85	0.73	0.29			
BIC	0.06	0.01	0.01	0.01	0.00	0.01	0.11	0.03			
CV.lse	0.09	0.06	0.03	0.02	0.00	0.00	0.65	0.45	0.07	0.05	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 55.9$
CV.min	0.61	0.41	0.36	0.23	0.07	0.05	0.81	0.64	0.59	0.40	
AICc	0.63	0.43	0.30	0.21	0.00	0.00	0.76	0.57			
AIC	0.94	0.92	0.94	0.90	0.94	0.90	0.90	0.81			
BIC	0.01	0.01	0.00	0.00	0.00	0.00	0.06	0.04			
CV.lse	0.01	0.00	0.00	0.00	0.00	0.00	0.68	0.16	0.16	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 55.6$
CV.min	0.44	0.07	0.31	0.04	0.10	0.01	0.85	0.38	0.47	0.07	
AICc	0.63	0.13	0.11	0.02	0.00	0.00	0.84	0.32			
AIC	0.94	0.94	0.94	0.93	0.94	0.91	0.91	0.74			
BIC	0.02	0.00	0.00	0.00	0.00	0.00	0.09	0.01			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.01	0.14	0.03	0.00	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 52.3$
CV.min	0.54	0.04	0.44	0.03	0.10	0.02	0.82	0.16	0.17	0.02	
AICc	0.66	0.05	0.12	0.02	0.00	0.02	0.82	0.18			
AIC	0.93	0.88	0.93	0.87	0.94	0.83	0.84	0.29			
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.lse	0.47	0.74	0.36	0.68	0.15	0.52	0.41	0.64	0.38	0.70	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 209.8$
CV.min	0.58	0.82	0.50	0.77	0.26	0.61	0.51	0.71	0.54	0.80	
AICc	0.46	0.73	0.40	0.70	0.35	0.67	0.45	0.67			
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			
CV.lse	0.60	0.72	0.55	0.67	0.38	0.55	0.58	0.52	0.37	0.55	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 209.4$
CV.min	0.66	0.82	0.61	0.79	0.46	0.65	0.62	0.62	0.44	0.62	
AICc	0.58	0.66	0.54	0.66	0.44	0.65	0.59	0.56			
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			
CV.lse	0.65	0.72	0.62	0.68	0.53	0.57	0.57	0.13	0.50	0.51	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 205.7$
CV.min	0.68	0.83	0.66	0.80	0.56	0.68	0.61	0.21	0.53	0.59	
AICc	0.63	0.62	0.61	0.65	0.54	0.65	0.61	0.20			
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			
CV.lse	0.41	0.47	0.25	0.33	0.06	0.11	0.51	0.56	0.40	0.47	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 143.5$
CV.min	0.61	0.67	0.47	0.54	0.18	0.25	0.62	0.67	0.61	0.67	
AICc	0.53	0.58	0.48	0.55	0.48	0.49	0.56	0.61			
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			
CV.lse	0.17	0.06	0.16	0.07	0.01	0.00	0.65	0.34	0.23	0.09	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 143.5$
CV.min	0.61	0.39	0.51	0.31	0.11	0.03	0.71	0.49	0.55	0.33	
AICc	0.61	0.31	0.52	0.34	0.53	0.45	0.69	0.42			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.05	0.01	0.01	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 139.4$
CV.min	0.48	0.02	0.40	0.02	0.08	0.01	0.71	0.19	0.21	0.04	
AICc	0.58	0.03	0.11	0.01	0.00	0.01	0.71	0.20			
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			
CV.lse	0.04	0.01	0.01	0.00	0.00	0.00	0.67	0.34	0.09	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 77.7$
CV.min	0.53	0.23	0.20	0.05	0.06	0.01	0.79	0.53	0.54	0.23	
AICc	0.60	0.27	0.14	0.07	0.00	0.00	0.75	0.45			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.09	0.25	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 77.7$
CV.min	0.38	0.03	0.22	0.01	0.08	0.00	0.84	0.28	0.48	0.03	
AICc	0.57	0.06	0.05	0.00	0.00	0.00	0.83	0.23			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.05	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 73.5$
CV.min	0.49	0.03	0.40	0.02	0.14	0.01	0.81	0.07	0.32	0.02	
AICc	0.64	0.04	0.11	0.01	0.01	0.01	0.82	0.08			
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			

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.lse	0.45	0.73	0.35	0.62	0.22	0.38	0.39	0.62	0.46	0.74	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 293.2$
CV.min	0.53	0.82	0.46	0.75	0.33	0.54	0.46	0.70	0.55	0.84	
AICc	0.39	0.64	0.36	0.63	0.40	0.64	0.39	0.62			
AIC	0.67	0.93	0.67	0.91	0.67	0.88	0.52	0.77			
BIC	0.00	0.00	0.00	0.00	0.28	0.43	0.02	0.04			
CV.lse	0.51	0.58	0.44	0.48	0.04	0.05	0.51	0.40	0.49	0.57	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 293.1$
CV.min	0.57	0.79	0.53	0.71	0.16	0.15	0.54	0.53	0.58	0.80	
AICc	0.47	0.36	0.47	0.52	0.46	0.63	0.51	0.43			
AIC	0.67	0.94	0.66	0.93	0.66	0.91	0.59	0.70			
BIC	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.00			
CV.lse	0.19	0.20	0.17	0.18	0.00	0.00	0.30	0.04	0.10	0.09	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 292.2$
CV.min	0.53	0.50	0.47	0.44	0.08	0.02	0.57	0.16	0.34	0.31	
AICc	0.47	0.03	0.16	0.08	0.51	0.63	0.56	0.16			
AIC	0.62	0.86	0.61	0.85	0.59	0.83	0.57	0.30			
BIC	0.05	0.00	0.01	0.00	0.00	0.00	0.06	0.01			
CV.lse	0.35	0.28	0.12	0.07	0.00	0.00	0.48	0.45	0.36	0.29	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 215.4$
CV.min	0.55	0.55	0.34	0.27	0.04	0.02	0.57	0.57	0.55	0.55	
AICc	0.46	0.41	0.47	0.42	0.37	0.32	0.51	0.48			
AIC	0.77	0.91	0.77	0.88	0.78	0.88	0.69	0.75			
BIC	0.00	0.00	0.00	0.00	0.06	0.06	0.02	0.01			
CV.lse	0.02	0.00	0.01	0.00	0.00	0.00	0.58	0.19	0.14	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 215.2$
CV.min	0.39	0.08	0.21	0.03	0.06	0.00	0.65	0.36	0.40	0.09	
AICc	0.48	0.10	0.12	0.04	0.21	0.16	0.63	0.27			
AIC	0.77	0.92	0.77	0.90	0.77	0.89	0.72	0.70			
BIC	0.01	0.00	0.00	0.00	0.00	0.00	0.05	0.00			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	0.01	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 211.7$
CV.min	0.44	0.02	0.36	0.01	0.10	0.01	0.66	0.07	0.24	0.01	
AICc	0.53	0.03	0.10	0.01	0.00	0.00	0.67	0.09			
AIC	0.75	0.85	0.75	0.84	0.75	0.80	0.69	0.33			
BIC	0.04	0.00	0.01	0.00	0.00	0.00	0.09	0.01			
CV.lse	0.02	0.00	0.00	0.00	0.00	0.00	0.72	0.25	0.16	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 91.3$
CV.min	0.50	0.12	0.14	0.01	0.07	0.00	0.81	0.43	0.52	0.12	
AICc	0.60	0.15	0.09	0.03	0.00	0.00	0.77	0.35			
AIC	0.91	0.90	0.91	0.89	0.91	0.91	0.88	0.72			
BIC	0.01	0.00	0.00	0.00	0.65	0.64	0.07	0.00			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.06	0.28	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 90.9$
CV.min	0.38	0.02	0.20	0.00	0.08	0.00	0.84	0.22	0.50	0.02	
AICc	0.58	0.04	0.03	0.00	0.00	0.00	0.83	0.18			
AIC	0.91	0.91	0.91	0.89	0.91	0.90	0.89	0.66			
BIC	0.02	0.00	0.00	0.00	0.02	0.02	0.11	0.00			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.19	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 87.0$
CV.min	0.42	0.02	0.31	0.01	0.13	0.01	0.82	0.05	0.44	0.01	
AICc	0.59	0.03	0.07	0.00	0.00	0.00	0.83	0.06			
AIC	0.91	0.85	0.91	0.82	0.91	0.82	0.85	0.15			
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.lse	0.33	0.26	0.19	0.24	0.01	0.20	0.22	0.22	0.01	0.19	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.67	0.33	0.59	0.31	0.20	0.24	0.51	0.26	0.19	0.24	
AICc	0.65	0.33	0.58	0.31	0.34	0.27	0.48	0.26			
AIC	0.88	0.72	0.88	0.72	0.88	0.69	0.49	0.26			
BIC	0.20	0.24	0.13	0.23	0.01	0.20	0.16	0.21			
CV.lse	0.38	0.26	0.23	0.24	0.02	0.20	0.26	0.22	0.01	0.19	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.69	0.34	0.62	0.31	0.23	0.24	0.53	0.26	0.19	0.24	
AICc	0.67	0.33	0.60	0.31	0.37	0.27	0.51	0.25			
AIC	0.88	0.72	0.88	0.72	0.88	0.69	0.51	0.25			
BIC	0.23	0.23	0.14	0.23	0.01	0.20	0.19	0.20			
CV.lse	0.41	0.26	0.26	0.24	0.03	0.20	0.28	0.21	0.01	0.19	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.70	0.34	0.63	0.31	0.26	0.24	0.53	0.25	0.21	0.24	
AICc	0.68	0.33	0.61	0.30	0.38	0.27	0.51	0.25			
AIC	0.88	0.71	0.88	0.71	0.88	0.69	0.52	0.25			
BIC	0.25	0.23	0.16	0.22	0.02	0.20	0.21	0.20			
CV.lse	0.25	0.17	0.12	0.15	0.01	0.12	0.42	0.19	0.01	0.12	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.25	0.56	0.22	0.14	0.16	0.74	0.28	0.24	0.17	
AICc	0.66	0.25	0.59	0.23	0.32	0.20	0.71	0.26			
AIC	0.89	0.79	0.89	0.79	0.89	0.76	0.79	0.32			
BIC	0.18	0.16	0.09	0.15	0.00	0.12	0.15	0.15			
CV.lse	0.29	0.17	0.15	0.15	0.01	0.12	0.46	0.19	0.01	0.12	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	0.25	0.59	0.22	0.14	0.16	0.76	0.28	0.22	0.17	
AICc	0.68	0.25	0.60	0.23	0.34	0.20	0.72	0.26			
AIC	0.89	0.79	0.89	0.79	0.89	0.76	0.79	0.32			
BIC	0.20	0.15	0.11	0.15	0.00	0.12	0.17	0.15			
CV.lse	0.33	0.17	0.17	0.15	0.02	0.12	0.47	0.19	0.01	0.12	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.69	0.25	0.61	0.22	0.17	0.16	0.75	0.28	0.25	0.17	
AICc	0.69	0.25	0.62	0.23	0.36	0.20	0.72	0.26			
AIC	0.89	0.79	0.89	0.78	0.89	0.76	0.79	0.31			
BIC	0.21	0.15	0.12	0.14	0.01	0.11	0.19	0.14			
CV.lse	0.11	0.07	0.05	0.06	0.01	0.05	0.56	0.14	0.01	0.05	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.15	0.50	0.13	0.13	0.08	0.81	0.26	0.35	0.11	
AICc	0.67	0.17	0.55	0.14	0.20	0.11	0.78	0.22			
AIC	0.90	0.85	0.90	0.84	0.90	0.83	0.87	0.42			
BIC	0.12	0.08	0.05	0.07	0.00	0.03	0.16	0.08			
CV.lse	0.13	0.07	0.07	0.06	0.01	0.05	0.61	0.14	0.01	0.05	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.67	0.15	0.54	0.13	0.14	0.08	0.82	0.25	0.33	0.10	
AICc	0.69	0.17	0.59	0.14	0.23	0.11	0.78	0.22			
AIC	0.90	0.85	0.90	0.84	0.90	0.83	0.87	0.42			
BIC	0.12	0.07	0.06	0.06	0.00	0.03	0.18	0.08			
CV.lse	0.15	0.07	0.08	0.06	0.02	0.04	0.60	0.14	0.02	0.05	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	0.15	0.56	0.13	0.15	0.08	0.81	0.25	0.34	0.10	
AICc	0.70	0.17	0.60	0.14	0.26	0.11	0.79	0.21			
AIC	0.90	0.85	0.90	0.84	0.90	0.83	0.86	0.41			
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.lse	0.50	0.86	0.36	0.82	0.07	0.69	0.44	0.77	0.11	0.72	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.92	0.57	0.89	0.19	0.78	0.59	0.83	0.36	0.84	
AICc	0.58	0.89	0.50	0.88	0.40	0.85	0.55	0.81			
AIC	0.87	0.97	0.87	0.96	0.87	0.94	0.64	0.85			
BIC	0.24	0.72	0.14	0.70	0.02	0.60	0.23	0.66			
CV.lse	0.54	0.86	0.40	0.82	0.07	0.68	0.47	0.76	0.10	0.71	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	0.92	0.59	0.90	0.20	0.78	0.61	0.82	0.34	0.83	
AICc	0.59	0.88	0.53	0.87	0.42	0.86	0.57	0.81			
AIC	0.87	0.97	0.87	0.97	0.87	0.95	0.67	0.85			
BIC	0.26	0.70	0.16	0.69	0.03	0.60	0.26	0.64			
CV.lse	0.55	0.86	0.42	0.82	0.09	0.69	0.48	0.75	0.13	0.72	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.69	0.92	0.60	0.90	0.23	0.78	0.61	0.82	0.36	0.83	
AICc	0.60	0.88	0.53	0.87	0.42	0.85	0.57	0.80			
AIC	0.87	0.97	0.87	0.97	0.87	0.95	0.67	0.85			
BIC	0.28	0.70	0.18	0.68	0.04	0.60	0.28	0.64			
CV.lse	0.41	0.53	0.26	0.45	0.07	0.31	0.50	0.56	0.24	0.44	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.67	0.52	0.60	0.19	0.42	0.66	0.67	0.54	0.62	
AICc	0.58	0.64	0.53	0.61	0.60	0.63	0.61	0.63			
AIC	0.89	0.92	0.89	0.91	0.89	0.89	0.78	0.77			
BIC	0.08	0.24	0.06	0.27	0.01	0.12	0.17	0.35			
CV.lse	0.45	0.52	0.30	0.45	0.08	0.31	0.54	0.56	0.21	0.41	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.67	0.55	0.60	0.20	0.42	0.68	0.66	0.52	0.59	
AICc	0.60	0.63	0.55	0.60	0.60	0.63	0.63	0.63			
AIC	0.89	0.92	0.89	0.92	0.89	0.89	0.79	0.77			
BIC	0.06	0.18	0.07	0.24	0.01	0.12	0.18	0.32			
CV.lse	0.47	0.52	0.33	0.45	0.10	0.30	0.54	0.55	0.24	0.42	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.67	0.56	0.60	0.22	0.41	0.68	0.65	0.53	0.59	
AICc	0.61	0.62	0.56	0.60	0.59	0.62	0.63	0.62			
AIC	0.89	0.93	0.89	0.91	0.89	0.89	0.79	0.76			
BIC	0.07	0.16	0.08	0.23	0.01	0.11	0.20	0.31			
CV.lse	0.08	0.03	0.03	0.01	0.00	0.00	0.59	0.28	0.07	0.03	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.56	0.26	0.31	0.13	0.07	0.03	0.75	0.44	0.55	0.25	
AICc	0.59	0.27	0.58	0.28	0.21	0.12	0.71	0.38			
AIC	0.90	0.90	0.90	0.89	0.90	0.89	0.85	0.67			
BIC	0.01	0.00	0.01	0.01	0.00	0.00	0.05	0.03			
CV.lse	0.07	0.02	0.03	0.01	0.00	0.00	0.62	0.27	0.08	0.02	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.56	0.23	0.33	0.12	0.07	0.02	0.76	0.43	0.54	0.22	
AICc	0.59	0.25	0.58	0.26	0.27	0.15	0.72	0.37			
AIC	0.90	0.90	0.90	0.89	0.90	0.89	0.86	0.68			
BIC	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02			
CV.lse	0.07	0.02	0.03	0.01	0.00	0.00	0.62	0.26	0.08	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.58	0.23	0.35	0.12	0.09	0.02	0.76	0.42	0.55	0.22	
AICc	0.61	0.25	0.60	0.26	0.26	0.14	0.72	0.36			
AIC	0.90	0.90	0.90	0.89	0.90	0.89	0.85	0.67			
BIC	0.01	0.00	0.01	0.00	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.lse	0.54	0.98	0.37	0.98	0.08	0.93	0.46	0.94	0.07	0.93	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	0.99	0.56	0.99	0.17	0.97	0.58	0.96	0.22	0.97	
AICc	0.58	0.99	0.48	0.99	0.26	0.97	0.54	0.95			
AIC	0.87	1.00	0.87	0.99	0.87	0.98	0.67	0.97			
BIC	0.30	0.93	0.19	0.93	0.03	0.87	0.29	0.87			
CV.lse	0.57	0.98	0.41	0.98	0.09	0.94	0.49	0.93	0.08	0.94	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.69	0.99	0.59	0.99	0.19	0.97	0.61	0.96	0.21	0.97	
AICc	0.60	0.99	0.51	0.99	0.28	0.98	0.56	0.95			
AIC	0.87	1.00	0.87	1.00	0.87	0.99	0.69	0.97			
BIC	0.33	0.92	0.22	0.93	0.04	0.88	0.32	0.86			
CV.lse	0.58	0.99	0.43	0.98	0.11	0.94	0.50	0.93	0.11	0.95	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.70	0.99	0.59	0.99	0.21	0.97	0.61	0.95	0.23	0.97	
AICc	0.60	0.99	0.52	0.99	0.29	0.97	0.57	0.94			
AIC	0.87	1.00	0.87	1.00	0.87	0.99	0.69	0.97			
BIC	0.34	0.92	0.24	0.93	0.05	0.88	0.34	0.85			
CV.lse	0.43	0.66	0.28	0.55	0.09	0.31	0.51	0.71	0.38	0.65	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.82	0.51	0.74	0.22	0.49	0.64	0.81	0.62	0.81	
AICc	0.57	0.77	0.52	0.75	0.59	0.75	0.59	0.77			
AIC	0.89	0.95	0.89	0.93	0.89	0.91	0.78	0.89			
BIC	0.00	0.02	0.02	0.09	0.00	0.01	0.10	0.27			
CV.lse	0.46	0.65	0.31	0.55	0.10	0.30	0.54	0.70	0.40	0.63	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.65	0.82	0.53	0.74	0.23	0.49	0.66	0.80	0.63	0.81	
AICc	0.58	0.76	0.54	0.75	0.59	0.76	0.60	0.76			
AIC	0.89	0.95	0.89	0.94	0.89	0.91	0.79	0.89			
BIC	0.00	0.01	0.01	0.05	0.00	0.01	0.09	0.20			
CV.lse	0.48	0.65	0.34	0.54	0.12	0.29	0.55	0.69	0.41	0.62	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.82	0.55	0.74	0.25	0.47	0.66	0.79	0.64	0.80	
AICc	0.59	0.76	0.55	0.75	0.60	0.75	0.61	0.75			
AIC	0.89	0.95	0.89	0.94	0.89	0.91	0.79	0.88			
BIC	0.00	0.01	0.01	0.04	0.00	0.01	0.09	0.17			
CV.lse	0.04	0.02	0.01	0.00	0.00	0.00	0.59	0.30	0.08	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.51	0.24	0.20	0.06	0.05	0.01	0.74	0.49	0.50	0.23	
AICc	0.55	0.26	0.59	0.30	0.14	0.09	0.69	0.41			
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	0.00	0.00	0.04	0.01			
CV.lse	0.04	0.01	0.00	0.00	0.00	0.00	0.62	0.29	0.08	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.48	0.20	0.19	0.05	0.04	0.01	0.75	0.47	0.48	0.19	
AICc	0.55	0.23	0.58	0.28	0.17	0.10	0.71	0.40			
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	0.00	0.00	0.04	0.01			
CV.lse	0.03	0.01	0.01	0.00	0.00	0.00	0.62	0.27	0.10	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.51	0.19	0.21	0.05	0.06	0.01	0.75	0.46	0.50	0.19	
AICc	0.57	0.23	0.59	0.28	0.16	0.09	0.71	0.39			
AIC	0.90	0.91	0.90	0.89	0.90	0.90	0.85	0.72			
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.lse	0.55	1.00	0.35	1.00	0.06	0.99	0.46	0.98	0.04	0.98	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	1.00	0.54	1.00	0.13	1.00	0.58	0.99	0.13	0.99	
AICc	0.58	1.00	0.46	1.00	0.11	0.99	0.53	0.98			
AIC	0.87	1.00	0.87	1.00	0.87	0.99	0.68	0.99			
BIC	0.34	0.99	0.20	0.99	0.03	0.96	0.33	0.95			
CV.lse	0.58	1.00	0.39	1.00	0.06	0.99	0.49	0.97	0.04	0.99	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.70	1.00	0.56	1.00	0.13	1.00	0.60	0.98	0.13	1.00	
AICc	0.60	1.00	0.48	1.00	0.11	0.99	0.56	0.98			
AIC	0.87	1.00	0.87	1.00	0.87	0.99	0.70	0.99			
BIC	0.37	0.98	0.23	0.99	0.03	0.97	0.36	0.94			
CV.lse	0.59	1.00	0.41	1.00	0.09	0.99	0.51	0.97	0.07	0.99	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.70	1.00	0.57	1.00	0.16	1.00	0.61	0.98	0.15	1.00	
AICc	0.61	1.00	0.49	1.00	0.12	0.99	0.57	0.98			
AIC	0.87	1.00	0.87	1.00	0.87	0.99	0.70	0.99			
BIC	0.39	0.98	0.25	0.99	0.04	0.97	0.38	0.94			
CV.lse	0.43	0.72	0.27	0.57	0.09	0.25	0.51	0.77	0.41	0.72	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.63	0.87	0.49	0.79	0.21	0.48	0.64	0.86	0.63	0.87	
AICc	0.56	0.82	0.52	0.81	0.60	0.80	0.58	0.82			
AIC	0.89	0.96	0.89	0.94	0.89	0.91	0.78	0.93			
BIC	0.00	0.00	0.01	0.04	0.00	0.01	0.05	0.15			
CV.lse	0.46	0.70	0.30	0.57	0.09	0.22	0.54	0.76	0.43	0.70	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.65	0.87	0.52	0.79	0.22	0.45	0.66	0.85	0.65	0.87	
AICc	0.58	0.81	0.54	0.81	0.59	0.81	0.60	0.81			
AIC	0.89	0.96	0.89	0.95	0.89	0.92	0.79	0.93			
BIC	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.09			
CV.lse	0.48	0.70	0.33	0.56	0.09	0.20	0.55	0.74	0.45	0.69	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.87	0.53	0.79	0.23	0.43	0.66	0.84	0.65	0.87	
AICc	0.58	0.81	0.55	0.81	0.60	0.80	0.61	0.80			
AIC	0.89	0.96	0.89	0.94	0.89	0.92	0.79	0.92			
BIC	0.00	0.00	0.00	0.01	0.00	0.00	0.04	0.07			
CV.lse	0.04	0.01	0.00	0.00	0.00	0.00	0.60	0.30	0.09	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.49	0.22	0.14	0.04	0.04	0.01	0.73	0.50	0.48	0.22	
AICc	0.54	0.25	0.60	0.32	0.09	0.06	0.69	0.42			
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	0.00	0.00	0.04	0.01			
CV.lse	0.03	0.01	0.00	0.00	0.00	0.00	0.62	0.29	0.10	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.45	0.17	0.15	0.03	0.04	0.01	0.74	0.48	0.45	0.17	
AICc	0.53	0.21	0.59	0.30	0.11	0.07	0.70	0.40			
AIC	0.90	0.91	0.90	0.89	0.90	0.91	0.85	0.75			
BIC	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.01			
CV.lse	0.03	0.01	0.00	0.00	0.00	0.00	0.63	0.27	0.12	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.47	0.17	0.17	0.03	0.05	0.01	0.75	0.47	0.47	0.16	
AICc	0.55	0.21	0.60	0.29	0.10	0.06	0.71	0.39			
AIC	0.90	0.91	0.90	0.89	0.90	0.90	0.85	0.74			
BIC	0.01	0.00	0.00	0.00	0.00	0.00	0.06	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.lse	0.33	0.26	0.20	0.24	0.02	0.20	0.22	0.22	0.00	0.19	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.67	0.33	0.59	0.31	0.20	0.24	0.51	0.26	0.19	0.24	
AICc	0.65	0.33	0.56	0.30	0.09	0.22	0.48	0.26			
AIC	0.88	0.72	0.88	0.72	0.88	0.69	0.49	0.26			
BIC	0.21	0.23	0.11	0.22	0.00	0.18	0.17	0.21			
CV.lse	0.68	0.27	0.57	0.24	0.16	0.18	0.47	0.18	0.04	0.18	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.79	0.36	0.75	0.32	0.49	0.24	0.56	0.20	0.23	0.21	
AICc	0.77	0.34	0.72	0.30	0.41	0.23	0.56	0.20			
AIC	0.88	0.66	0.88	0.66	0.87	0.65	0.56	0.20			
BIC	0.46	0.20	0.34	0.19	0.04	0.16	0.46	0.18			
CV.lse	0.81	0.28	0.79	0.25	0.68	0.18	0.03	0.11	0.45	0.16	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.83	0.37	0.82	0.34	0.75	0.24	0.06	0.12	0.61	0.20	
AICc	0.82	0.33	0.81	0.30	0.72	0.22	0.06	0.12			
AIC	0.84	0.39	0.84	0.39	0.81	0.35	0.06	0.12			
BIC	0.74	0.17	0.72	0.15	0.45	0.10	0.05	0.12			
CV.lse	0.25	0.17	0.12	0.15	0.01	0.12	0.43	0.19	0.01	0.12	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.66	0.25	0.56	0.22	0.14	0.16	0.75	0.28	0.23	0.17	
AICc	0.66	0.25	0.52	0.21	0.03	0.13	0.71	0.26			
AIC	0.89	0.79	0.89	0.79	0.89	0.76	0.79	0.32			
BIC	0.18	0.16	0.07	0.14	0.00	0.10	0.15	0.15			
CV.lse	0.61	0.16	0.49	0.14	0.11	0.11	0.70	0.18	0.06	0.11	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.79	0.26	0.75	0.23	0.40	0.15	0.80	0.25	0.30	0.14	
AICc	0.78	0.25	0.73	0.21	0.28	0.14	0.79	0.24			
AIC	0.89	0.75	0.89	0.75	0.89	0.72	0.80	0.26			
BIC	0.38	0.12	0.27	0.11	0.02	0.08	0.47	0.12			
CV.lse	0.63	0.11	0.74	0.12	0.71	0.10	0.30	0.10	0.57	0.09	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.83	0.24	0.83	0.22	0.77	0.14	0.49	0.13	0.70	0.13	
AICc	0.84	0.23	0.82	0.19	0.71	0.12	0.49	0.13			
AIC	0.87	0.48	0.87	0.49	0.87	0.47	0.49	0.13			
BIC	0.08	0.01	0.01	0.01	0.01	0.01	0.32	0.10			
CV.lse	0.11	0.07	0.05	0.06	0.01	0.05	0.57	0.15	0.01	0.05	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.16	0.50	0.13	0.12	0.08	0.81	0.26	0.34	0.11	
AICc	0.67	0.17	0.40	0.12	0.00	0.04	0.78	0.22			
AIC	0.90	0.85	0.90	0.84	0.90	0.83	0.87	0.41			
BIC	0.12	0.08	0.03	0.06	0.00	0.02	0.15	0.08			
CV.lse	0.14	0.02	0.17	0.03	0.06	0.03	0.73	0.11	0.09	0.04	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.74	0.12	0.71	0.11	0.33	0.06	0.84	0.22	0.41	0.07	
AICc	0.77	0.14	0.65	0.10	0.04	0.02	0.83	0.19			
AIC	0.90	0.83	0.90	0.82	0.90	0.80	0.87	0.33			
BIC	0.09	0.02	0.04	0.02	0.00	0.01	0.16	0.02			
CV.lse	0.00	0.01	0.00	0.01	0.00	0.01	0.41	0.05	0.01	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.52	0.02	0.41	0.01	0.14	0.01	0.75	0.14	0.32	0.03	
AICc	0.64	0.03	0.18	0.01	0.00	0.01	0.74	0.14			
AIC	0.88	0.58	0.89	0.60	0.89	0.57	0.76	0.15			
BIC	0.08	0.01	0.01	0.01	0.00	0.01	0.12	0.02			



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.lse	0.51	0.86	0.36	0.82	0.07	0.69	0.44	0.77	0.11	0.72	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.67	0.91	0.57	0.89	0.19	0.78	0.59	0.83	0.36	0.84	
AICc	0.58	0.89	0.49	0.87	0.23	0.78	0.55	0.81			
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			
CV.lse	0.70	0.84	0.63	0.80	0.33	0.68	0.67	0.67	0.24	0.67	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.77	0.91	0.72	0.89	0.48	0.78	0.71	0.73	0.42	0.76	
AICc	0.70	0.84	0.66	0.83	0.47	0.79	0.69	0.71			
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			
CV.lse	0.76	0.82	0.73	0.78	0.61	0.67	0.57	0.20	0.54	0.63	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.79	0.89	0.77	0.88	0.66	0.77	0.61	0.24	0.60	0.70	
AICc	0.75	0.80	0.73	0.79	0.64	0.74	0.61	0.24			
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			
CV.lse	0.41	0.53	0.26	0.45	0.07	0.30	0.50	0.56	0.24	0.44	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.67	0.52	0.60	0.18	0.41	0.66	0.67	0.54	0.62	
AICc	0.58	0.63	0.49	0.59	0.28	0.46	0.60	0.63			
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			
CV.lse	0.63	0.39	0.59	0.39	0.33	0.26	0.70	0.44	0.36	0.34	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.75	0.61	0.71	0.57	0.47	0.39	0.76	0.55	0.53	0.45	
AICc	0.71	0.53	0.68	0.52	0.57	0.51	0.74	0.51			
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			
CV.lse	0.07	0.04	0.22	0.12	0.22	0.11	0.64	0.16	0.63	0.28	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.61	0.23	0.64	0.35	0.48	0.26	0.72	0.25	0.71	0.40	
AICc	0.67	0.17	0.35	0.15	0.26	0.18	0.72	0.25			
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			
CV.lse	0.08	0.03	0.03	0.01	0.00	0.00	0.60	0.29	0.07	0.03	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.56	0.26	0.33	0.14	0.07	0.03	0.75	0.44	0.55	0.25	
AICc	0.59	0.27	0.28	0.13	0.00	0.00	0.71	0.38			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.11	0.16	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.42	0.04	0.30	0.03	0.10	0.01	0.81	0.28	0.45	0.04	
AICc	0.59	0.08	0.10	0.01	0.00	0.00	0.79	0.23			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	0.00	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.52	0.02	0.40	0.02	0.10	0.01	0.77	0.11	0.16	0.01	
AICc	0.62	0.03	0.11	0.01	0.00	0.01	0.79	0.12			
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			

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.lse	0.54	0.98	0.38	0.98	0.08	0.93	0.46	0.94	0.07	0.93	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	0.99	0.56	0.99	0.17	0.97	0.58	0.96	0.23	0.97	
AICc	0.58	0.99	0.47	0.99	0.10	0.94	0.54	0.95			
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			
CV.lse	0.72	0.98	0.65	0.98	0.36	0.96	0.68	0.84	0.28	0.96	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.78	1.00	0.72	0.99	0.48	0.99	0.72	0.90	0.41	0.98	
AICc	0.70	0.98	0.65	0.98	0.38	0.97	0.70	0.87			
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			
CV.lse	0.76	0.98	0.72	0.97	0.58	0.95	0.63	0.25	0.52	0.94	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.80	0.99	0.77	0.99	0.63	0.98	0.67	0.35	0.57	0.97	
AICc	0.74	0.96	0.71	0.97	0.57	0.96	0.66	0.34			
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			
CV.lse	0.43	0.66	0.28	0.55	0.09	0.31	0.51	0.71	0.38	0.64	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.82	0.51	0.74	0.22	0.49	0.65	0.81	0.62	0.81	
AICc	0.56	0.77	0.48	0.72	0.42	0.64	0.59	0.77			
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			
CV.lse	0.41	0.27	0.42	0.30	0.06	0.05	0.69	0.49	0.43	0.35	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.71	0.67	0.67	0.64	0.25	0.20	0.74	0.64	0.60	0.58	
AICc	0.68	0.54	0.65	0.60	0.60	0.66	0.72	0.57			
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			
CV.lse	0.01	0.01	0.02	0.01	0.00	0.01	0.52	0.11	0.11	0.07	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.55	0.05	0.48	0.09	0.14	0.02	0.73	0.26	0.41	0.21	
AICc	0.63	0.05	0.17	0.03	0.04	0.04	0.73	0.28			
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			
CV.lse	0.05	0.01	0.01	0.00	0.00	0.00	0.60	0.30	0.07	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.51	0.24	0.20	0.07	0.04	0.01	0.74	0.49	0.51	0.24	
AICc	0.56	0.26	0.18	0.09	0.00	0.00	0.69	0.41			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.09	0.22	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.36	0.03	0.21	0.01	0.07	0.00	0.81	0.27	0.45	0.03	
AICc	0.54	0.06	0.05	0.00	0.00	0.00	0.79	0.21			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.01	0.04	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.51	0.02	0.41	0.02	0.13	0.01	0.78	0.07	0.31	0.02	
AICc	0.63	0.03	0.11	0.01	0.01	0.01	0.79	0.08			
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			

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.lse	0.55	1.00	0.35	1.00	0.06	0.99	0.46	0.98	0.04	0.98	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.68	1.00	0.54	1.00	0.13	1.00	0.58	0.99	0.14	0.99	
AICc	0.58	1.00	0.44	1.00	0.03	0.98	0.53	0.98			
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			
CV.lse	0.73	1.00	0.64	1.00	0.31	1.00	0.68	0.90	0.11	1.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.78	1.00	0.71	1.00	0.38	1.00	0.73	0.94	0.19	1.00	
AICc	0.71	1.00	0.63	1.00	0.22	1.00	0.70	0.92			
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			
CV.lse	0.77	1.00	0.72	1.00	0.56	1.00	0.63	0.30	0.46	1.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.81	1.00	0.77	1.00	0.60	1.00	0.67	0.47	0.52	1.00	
AICc	0.74	0.99	0.70	1.00	0.51	0.99	0.67	0.46			
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			
CV.lse	0.44	0.72	0.27	0.57	0.09	0.25	0.51	0.77	0.42	0.72	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.64	0.87	0.49	0.79	0.22	0.48	0.64	0.86	0.64	0.87	
AICc	0.56	0.83	0.48	0.78	0.43	0.67	0.58	0.82			
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			
CV.lse	0.24	0.14	0.22	0.15	0.01	0.01	0.68	0.49	0.28	0.18	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.65	0.60	0.56	0.53	0.10	0.04	0.74	0.66	0.61	0.57	
AICc	0.63	0.46	0.61	0.62	0.60	0.73	0.71	0.59			
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			
CV.lse	0.01	0.01	0.01	0.01	0.01	0.01	0.32	0.06	0.02	0.01	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.57	0.05	0.50	0.04	0.16	0.02	0.73	0.24	0.29	0.05	
AICc	0.64	0.05	0.20	0.02	0.04	0.04	0.73	0.26			
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			
CV.lse	0.04	0.01	0.01	0.00	0.00	0.00	0.60	0.31	0.07	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.48	0.22	0.15	0.04	0.04	0.01	0.73	0.50	0.49	0.22	
AICc	0.54	0.25	0.13	0.07	0.00	0.00	0.69	0.42			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.08	0.24	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.34	0.03	0.18	0.01	0.07	0.00	0.81	0.26	0.45	0.03	
AICc	0.53	0.06	0.03	0.00	0.00	0.00	0.79	0.21			
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			
CV.lse	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.01	0.08	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 100.0$
CV.min	0.49	0.02	0.38	0.01	0.14	0.01	0.79	0.06	0.39	0.02	
AICc	0.62	0.03	0.11	0.01	0.01	0.00	0.79	0.07			
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			

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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 21.3$
CV.min	0.74	0.46	0.57	0.39	0.17	0.19	0.84	0.51	0.54	0.40	
AICc	0.59	0.37	0.44	0.34	0.82	0.42	0.68	0.40			
AIC	0.89	0.59	0.88	0.55	0.88	0.44	0.87	0.54			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 20.9$
CV.min	0.72	0.41	0.57	0.35	0.17	0.17	0.86	0.49	0.49	0.35	
AICc	0.60	0.33	0.45	0.31	0.83	0.40	0.70	0.37			
AIC	0.90	0.57	0.89	0.54	0.89	0.43	0.88	0.52			
BIC	0.90	0.56	0.89	0.54	0.89	0.43	0.86	0.50			
CV.1se	0.28	0.17	0.19	0.15	0.04	0.08	0.77	0.40	0.17	0.17	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 20.7$
CV.min	0.74	0.39	0.57	0.32	0.16	0.15	0.86	0.47	0.50	0.32	
AICc	0.62	0.30	0.46	0.29	0.84	0.38	0.72	0.35			
AIC	0.90	0.55	0.89	0.52	0.89	0.41	0.89	0.49			
BIC	0.90	0.55	0.89	0.52	0.89	0.40	0.86	0.48			
CV.1se	0.10	0.05	0.06	0.03	0.02	0.02	0.85	0.42	0.16	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 14.5$
CV.min	0.57	0.25	0.35	0.14	0.12	0.05	0.91	0.49	0.51	0.23	
AICc	0.55	0.23	0.46	0.21	0.93	0.29	0.78	0.34			
AIC	0.94	0.54	0.94	0.46	0.94	0.31	0.93	0.51			
BIC	0.93	0.54	0.94	0.46	0.94	0.30	0.92	0.51			
CV.1se	0.08	0.03	0.05	0.02	0.02	0.02	0.86	0.40	0.15	0.04	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 14.4$
CV.min	0.56	0.22	0.34	0.13	0.12	0.05	0.92	0.47	0.51	0.20	
AICc	0.56	0.20	0.45	0.17	0.93	0.28	0.80	0.31			
AIC	0.94	0.51	0.94	0.44	0.95	0.30	0.93	0.48			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 14.1$
CV.min	0.58	0.21	0.35	0.12	0.13	0.05	0.92	0.46	0.53	0.19	
AICc	0.58	0.19	0.42	0.16	0.93	0.27	0.81	0.30			
AIC	0.94	0.51	0.94	0.43	0.95	0.29	0.93	0.47			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 7.8$
CV.min	0.43	0.10	0.22	0.03	0.10	0.01	0.96	0.42	0.55	0.10	
AICc	0.55	0.11	0.79	0.19	0.98	0.20	0.91	0.23			
AIC	0.97	0.46	0.98	0.34	0.98	0.22	0.97	0.44			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 8.0$
CV.min	0.43	0.09	0.23	0.03	0.12	0.01	0.96	0.40	0.58	0.09	
AICc	0.56	0.09	0.75	0.16	0.98	0.18	0.90	0.23			
AIC	0.97	0.43	0.98	0.32	0.98	0.20	0.97	0.42			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 7.6$
CV.min	0.45	0.10	0.21	0.03	0.10	0.02	0.97	0.39	0.61	0.10	
AICc	0.57	0.10	0.71	0.17	0.98	0.19	0.92	0.23			
AIC	0.97	0.45	0.98	0.33	0.98	0.21	0.97	0.41			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 56.8$
CV.min	0.46	0.07	0.18	0.01	0.08	0.01	0.84	0.25	0.53	0.08	
AICc	0.47	0.05	0.77	0.12	0.89	0.11	0.72	0.11			
AIC	0.86	0.29	0.88	0.21	0.90	0.13	0.85	0.26			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 56.2$
CV.min	0.45	0.06	0.20	0.01	0.08	0.00	0.84	0.23	0.50	0.06	
AICc	0.48	0.04	0.76	0.11	0.89	0.11	0.74	0.11			
AIC	0.87	0.28	0.88	0.20	0.91	0.12	0.86	0.25			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 56.5$
CV.min	0.44	0.06	0.21	0.01	0.10	0.00	0.85	0.22	0.51	0.06	
AICc	0.48	0.04	0.73	0.10	0.90	0.10	0.76	0.10			
AIC	0.87	0.27	0.89	0.20	0.91	0.12	0.86	0.24			
BIC	0.87	0.27	0.89	0.19	0.91	0.12	0.86	0.24			
CV.1se	0.04	0.00	0.01	0.00	0.01	0.00	0.88	0.19	0.28	0.01	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 31.7$
CV.min	0.43	0.05	0.18	0.01	0.09	0.00	0.91	0.25	0.55	0.05	
AICc	0.52	0.04	0.90	0.13	0.94	0.11	0.84	0.11			
AIC	0.92	0.30	0.94	0.20	0.95	0.12	0.92	0.27			
BIC	0.92	0.29	0.94	0.20	0.95	0.12	0.92	0.27			
CV.1se	0.03	0.00	0.03	0.00	0.01	0.00	0.89	0.17	0.27	0.01	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 31.4$
CV.min	0.43	0.04	0.21	0.01	0.08	0.00	0.92	0.23	0.54	0.04	
AICc	0.52	0.04	0.90	0.12	0.94	0.11	0.85	0.11			
AIC	0.93	0.28	0.94	0.19	0.95	0.12	0.92	0.25			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 31.0$
CV.min	0.42	0.04	0.20	0.01	0.10	0.00	0.92	0.23	0.55	0.04	
AICc	0.52	0.04	0.89	0.12	0.95	0.10	0.86	0.10			
AIC	0.93	0.27	0.94	0.19	0.95	0.12	0.93	0.25			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 8.5$
CV.min	0.40	0.04	0.16	0.01	0.10	0.00	0.98	0.25	0.61	0.04	
AICc	0.57	0.04	0.98	0.13	0.98	0.11	0.94	0.11			
AIC	0.98	0.29	0.98	0.18	0.99	0.12	0.98	0.27			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 8.9$
CV.min	0.42	0.03	0.16	0.01	0.10	0.00	0.98	0.24	0.59	0.03	
AICc	0.53	0.03	0.98	0.13	0.98	0.12	0.94	0.11			
AIC	0.98	0.28	0.98	0.18	0.99	0.13	0.98	0.26			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 8.1$
CV.min	0.41	0.04	0.18	0.01	0.10	0.01	0.98	0.25	0.62	0.04	
AICc	0.59	0.04	0.98	0.13	0.99	0.12	0.95	0.12			
AIC	0.98	0.29	0.98	0.19	0.99	0.12	0.98	0.27			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 78.1$
CV.min	0.42	0.04	0.16	0.01	0.09	0.00	0.83	0.18	0.53	0.04	
AICc	0.45	0.03	0.83	0.10	0.88	0.09	0.75	0.07			
AIC	0.85	0.23	0.87	0.15	0.89	0.10	0.84	0.20			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 77.8$
CV.min	0.43	0.03	0.18	0.00	0.09	0.00	0.84	0.17	0.51	0.03	
AICc	0.47	0.02	0.84	0.09	0.89	0.08	0.76	0.07			
AIC	0.86	0.21	0.88	0.15	0.89	0.10	0.85	0.19			
BIC	0.86	0.21	0.88	0.14	0.89	0.10	0.85	0.19			
CV.1se	0.04	0.00	0.03	0.00	0.01	0.00	0.81	0.12	0.26	0.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 77.2$
CV.min	0.44	0.03	0.20	0.00	0.09	0.00	0.84	0.17	0.55	0.03	
AICc	0.51	0.02	0.84	0.09	0.89	0.08	0.77	0.06			
AIC	0.86	0.21	0.88	0.14	0.89	0.10	0.85	0.19			
BIC	0.86	0.21	0.88	0.14	0.89	0.09	0.85	0.18			
CV.1se	0.04	0.00	0.01	0.00	0.01	0.00	0.90	0.14	0.32	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 38.0$
CV.min	0.45	0.04	0.16	0.00	0.10	0.00	0.92	0.19	0.60	0.03	
AICc	0.55	0.03	0.93	0.10	0.94	0.09	0.86	0.07			
AIC	0.93	0.23	0.94	0.15	0.95	0.10	0.92	0.21			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 36.9$
CV.min	0.42	0.03	0.18	0.00	0.08	0.00	0.92	0.19	0.59	0.03	
AICc	0.52	0.02	0.93	0.10	0.95	0.09	0.88	0.07			
AIC	0.93	0.23	0.94	0.15	0.95	0.10	0.93	0.20			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 37.1$
CV.min	0.45	0.03	0.19	0.00	0.10	0.00	0.92	0.18	0.58	0.03	
AICc	0.56	0.02	0.93	0.10	0.95	0.09	0.87	0.07			
AIC	0.93	0.23	0.94	0.15	0.95	0.10	0.93	0.20			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 6.6$
CV.min	0.41	0.03	0.15	0.00	0.09	0.00	0.98	0.21	0.62	0.03	
AICc	0.57	0.02	0.99	0.10	0.99	0.09	0.96	0.07			
AIC	0.99	0.26	0.99	0.14	0.99	0.10	0.98	0.23			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 6.9$
CV.min	0.43	0.02	0.15	0.00	0.09	0.00	0.98	0.20	0.61	0.02	
AICc	0.58	0.03	0.99	0.10	0.99	0.09	0.95	0.09			
AIC	0.99	0.24	0.99	0.14	0.99	0.10	0.98	0.22			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 6.4$
CV.min	0.43	0.03	0.16	0.00	0.09	0.00	0.98	0.20	0.63	0.03	
AICc	0.60	0.03	0.99	0.11	0.99	0.10	0.96	0.08			
AIC	0.99	0.25	0.99	0.15	0.99	0.11	0.98	0.23			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 91.2$
CV.min	0.43	0.03	0.16	0.00	0.09	0.00	0.85	0.14	0.57	0.03	
AICc	0.50	0.02	0.86	0.07	0.88	0.07	0.79	0.05			
AIC	0.86	0.18	0.88	0.12	0.89	0.08	0.85	0.16			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 90.8$
CV.min	0.42	0.02	0.16	0.00	0.10	0.00	0.85	0.14	0.55	0.02	
AICc	0.50	0.01	0.87	0.07	0.89	0.07	0.79	0.05			
AIC	0.86	0.18	0.88	0.12	0.89	0.08	0.86	0.15			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 90.3$
CV.min	0.44	0.02	0.18	0.00	0.11	0.00	0.85	0.13	0.58	0.02	
AICc	0.53	0.01	0.87	0.07	0.89	0.07	0.81	0.04			
AIC	0.86	0.17	0.88	0.12	0.89	0.08	0.86	0.15			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 41.6$
CV.min	0.44	0.03	0.15	0.00	0.10	0.00	0.93	0.16	0.64	0.03	
AICc	0.55	0.02	0.94	0.08	0.95	0.08	0.90	0.06			
AIC	0.94	0.20	0.94	0.12	0.95	0.08	0.93	0.17			
BIC	0.94	0.20	0.95	0.12	0.95	0.08	0.93	0.17			
CV.1se	0.03	0.00	0.02	0.00	0.02	0.00	0.92	0.11	0.32	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 41.3$
CV.min	0.45	0.02	0.17	0.00	0.09	0.00	0.93	0.16	0.62	0.02	
AICc	0.56	0.02	0.94	0.08	0.95	0.08	0.90	0.05			
AIC	0.94	0.20	0.94	0.12	0.95	0.09	0.94	0.17			
BIC	0.94	0.19	0.94	0.12	0.95	0.09	0.94	0.17			
CV.1se	0.04	0.00	0.01	0.00	0.01	0.00	0.92	0.11	0.33	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 40.7$
CV.min	0.46	0.02	0.19	0.00	0.11	0.00	0.93	0.15	0.62	0.02	
AICc	0.56	0.02	0.94	0.08	0.95	0.08	0.90	0.06			
AIC	0.94	0.20	0.95	0.13	0.95	0.09	0.94	0.17			
BIC	0.94	0.20	0.95	0.12	0.95	0.09	0.94	0.17			
CV.1se	0.03	0.00	0.01	0.00	0.01	0.00	0.98	0.11	0.35	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 5.1$
CV.min	0.42	0.02	0.14	0.00	0.09	0.00	0.99	0.18	0.62	0.02	
AICc	0.57	0.02	0.99	0.08	0.99	0.08	0.97	0.06			
AIC	0.99	0.24	0.99	0.11	0.99	0.08	0.99	0.20			
BIC	0.99	0.24	0.99	0.10	0.99	0.08	0.99	0.20			
CV.1se	0.03	0.00	0.01	0.00	0.01	0.00	0.98	0.13	0.36	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 5.6$
CV.min	0.44	0.02	0.14	0.00	0.08	0.00	0.99	0.18	0.64	0.02	
AICc	0.57	0.03	0.99	0.09	0.99	0.09	0.97	0.07			
AIC	0.99	0.21	0.99	0.12	0.99	0.09	0.99	0.20			
BIC	0.99	0.21	0.99	0.12	0.99	0.09	0.99	0.20			
CV.1se	0.02	0.00	0.01	0.00	0.01	0.00	0.97	0.13	0.35	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 5.2$
CV.min	0.44	0.02	0.17	0.01	0.09	0.00	0.99	0.19	0.65	0.03	
AICc	0.58	0.03	0.99	0.10	0.99	0.09	0.97	0.07			
AIC	0.99	0.23	0.99	0.13	0.99	0.10	0.99	0.21			
BIC	0.99	0.23	0.99	0.12	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.lse	0.29	0.23	0.17	0.19	0.03	0.10	0.73	0.45	0.17	0.20	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 20.7$
CV.min	0.72	0.46	0.54	0.38	0.15	0.19	0.84	0.52	0.52	0.39	
AICc	0.58	0.37	0.24	0.25	0.80	0.41	0.67	0.40			
AIC	0.89	0.59	0.88	0.56	0.88	0.44	0.87	0.54			
BIC	0.89	0.59	0.88	0.56	0.88	0.44	0.84	0.53			
CV.lse	0.08	0.03	0.07	0.03	0.02	0.03	0.85	0.19	0.10	0.06	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 20.4$
CV.min	0.62	0.12	0.51	0.10	0.14	0.06	0.92	0.25	0.39	0.12	
AICc	0.63	0.11	0.17	0.06	0.70	0.18	0.84	0.15			
AIC	0.94	0.34	0.94	0.32	0.94	0.25	0.94	0.28			
BIC	0.94	0.33	0.94	0.32	0.94	0.25	0.86	0.26			
CV.lse	0.06	0.06	0.04	0.06	0.01	0.06	0.54	0.16	0.01	0.06	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 18.3$
CV.min	0.63	0.08	0.51	0.07	0.14	0.06	0.81	0.32	0.23	0.06	
AICc	0.65	0.08	0.14	0.06	0.00	0.06	0.76	0.22			
AIC	0.97	0.19	0.97	0.17	0.97	0.14	0.86	0.44			
BIC	0.84	0.16	0.87	0.16	0.97	0.14	0.26	0.09			
CV.lse	0.09	0.05	0.05	0.04	0.02	0.02	0.84	0.42	0.12	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 14.4$
CV.min	0.54	0.24	0.33	0.14	0.10	0.06	0.91	0.50	0.50	0.23	
AICc	0.57	0.23	0.11	0.07	0.93	0.28	0.78	0.34			
AIC	0.93	0.55	0.94	0.46	0.94	0.31	0.93	0.51			
BIC	0.93	0.54	0.94	0.46	0.94	0.30	0.92	0.51			
CV.lse	0.04	0.01	0.03	0.01	0.02	0.01	0.89	0.19	0.15	0.03	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 14.2$
CV.min	0.50	0.09	0.37	0.06	0.13	0.03	0.95	0.26	0.47	0.08	
AICc	0.59	0.09	0.10	0.03	0.94	0.17	0.87	0.14			
AIC	0.96	0.32	0.96	0.28	0.97	0.20	0.96	0.28			
BIC	0.96	0.32	0.96	0.28	0.97	0.20	0.95	0.28			
CV.lse	0.06	0.08	0.04	0.08	0.01	0.09	0.44	0.14	0.01	0.09	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 11.6$
CV.min	0.64	0.14	0.51	0.11	0.14	0.10	0.86	0.24	0.22	0.11	
AICc	0.65	0.13	0.13	0.10	0.02	0.10	0.80	0.17			
AIC	0.98	0.23	0.98	0.20	0.98	0.17	0.93	0.49			
BIC	0.97	0.22	0.98	0.20	0.98	0.16	0.31	0.13			
CV.lse	0.03	0.01	0.02	0.01	0.01	0.00	0.93	0.35	0.27	0.02	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 7.9$
CV.min	0.41	0.10	0.20	0.04	0.10	0.02	0.96	0.43	0.55	0.10	
AICc	0.53	0.11	0.24	0.06	0.98	0.20	0.90	0.25			
AIC	0.97	0.47	0.98	0.34	0.98	0.22	0.97	0.45			
BIC	0.97	0.46	0.98	0.34	0.98	0.21	0.97	0.45			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.94	0.20	0.31	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 7.6$
CV.min	0.42	0.06	0.26	0.03	0.13	0.01	0.98	0.27	0.60	0.06	
AICc	0.57	0.07	0.07	0.01	0.98	0.15	0.93	0.15			
AIC	0.98	0.32	0.98	0.26	0.99	0.17	0.98	0.30			
BIC	0.98	0.31	0.98	0.25	0.99	0.17	0.98	0.30			
CV.lse	0.03	0.04	0.03	0.04	0.01	0.05	0.57	0.27	0.15	0.11	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 5.5$
CV.min	0.51	0.25	0.40	0.21	0.15	0.14	0.92	0.37	0.48	0.24	
AICc	0.63	0.28	0.10	0.13	0.66	0.24	0.88	0.34			
AIC	0.99	0.38	0.99	0.35	0.99	0.31	0.98	0.49			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 57.2$
CV.min	0.47	0.08	0.20	0.01	0.09	0.00	0.83	0.25	0.51	0.07	
AICc	0.47	0.05	0.36	0.05	0.89	0.11	0.72	0.12			
AIC	0.86	0.29	0.88	0.21	0.90	0.13	0.84	0.26			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 57.0$
CV.min	0.40	0.02	0.24	0.01	0.09	0.00	0.90	0.13	0.52	0.02	
AICc	0.52	0.02	0.08	0.00	0.92	0.08	0.85	0.05			
AIC	0.91	0.18	0.92	0.15	0.93	0.10	0.91	0.16			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 55.0$
CV.min	0.54	0.03	0.44	0.02	0.18	0.01	0.85	0.06	0.41	0.02	
AICc	0.62	0.03	0.10	0.01	0.43	0.04	0.81	0.04			
AIC	0.93	0.14	0.93	0.12	0.93	0.10	0.91	0.15			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 30.6$
CV.min	0.44	0.05	0.18	0.01	0.10	0.00	0.91	0.25	0.55	0.05	
AICc	0.54	0.05	0.60	0.08	0.94	0.12	0.84	0.12			
AIC	0.93	0.30	0.94	0.20	0.95	0.13	0.92	0.27			
BIC	0.93	0.30	0.94	0.20	0.95	0.13	0.92	0.27			
CV.1se	0.03	0.00	0.02	0.00	0.01	0.00	0.91	0.09	0.30	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 30.4$
CV.min	0.36	0.02	0.23	0.01	0.11	0.00	0.94	0.15	0.56	0.02	
AICc	0.52	0.02	0.14	0.01	0.96	0.08	0.91	0.06			
AIC	0.95	0.20	0.95	0.15	0.96	0.10	0.95	0.17			
BIC	0.95	0.19	0.95	0.15	0.96	0.10	0.95	0.17			
CV.1se	0.03	0.01	0.03	0.01	0.02	0.00	0.54	0.04	0.17	0.01	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 27.7$
CV.min	0.46	0.04	0.35	0.03	0.15	0.01	0.89	0.09	0.50	0.03	
AICc	0.57	0.04	0.09	0.01	0.83	0.08	0.85	0.07			
AIC	0.96	0.16	0.96	0.14	0.96	0.11	0.95	0.20			
BIC	0.96	0.16	0.96	0.14	0.96	0.11	0.66	0.10			
CV.1se	0.03	0.00	0.02	0.00	0.02	0.00	0.96	0.19	0.30	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 8.7$
CV.min	0.43	0.04	0.17	0.00	0.10	0.00	0.98	0.24	0.60	0.03	
AICc	0.59	0.03	0.93	0.12	0.98	0.11	0.95	0.11			
AIC	0.98	0.29	0.98	0.18	0.99	0.11	0.98	0.26			
BIC	0.98	0.29	0.98	0.18	0.99	0.11	0.98	0.26			
CV.1se	0.02	0.00	0.01	0.00	0.01	0.00	0.95	0.12	0.32	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 8.5$
CV.min	0.40	0.02	0.19	0.00	0.11	0.00	0.98	0.17	0.59	0.02	
AICc	0.59	0.03	0.50	0.05	0.99	0.10	0.96	0.08			
AIC	0.98	0.23	0.99	0.16	0.99	0.11	0.98	0.20			
BIC	0.98	0.23	0.99	0.16	0.99	0.11	0.98	0.20			
CV.1se	0.01	0.00	0.02	0.00	0.01	0.00	0.58	0.10	0.31	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 7.3$
CV.min	0.42	0.07	0.27	0.04	0.12	0.01	0.94	0.20	0.60	0.07	
AICc	0.57	0.08	0.07	0.01	0.98	0.18	0.92	0.16			
AIC	0.99	0.28	0.99	0.23	0.99	0.20	0.98	0.30			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 77.5$
CV.min	0.43	0.04	0.15	0.00	0.08	0.00	0.83	0.18	0.51	0.04	
AICc	0.48	0.03	0.67	0.07	0.88	0.09	0.74	0.07			
AIC	0.85	0.23	0.87	0.15	0.89	0.10	0.84	0.20			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 77.5$
CV.min	0.39	0.01	0.20	0.00	0.09	0.00	0.89	0.11	0.54	0.01	
AICc	0.51	0.01	0.17	0.01	0.91	0.07	0.85	0.04			
AIC	0.90	0.16	0.90	0.12	0.91	0.09	0.90	0.13			
BIC	0.90	0.15	0.90	0.12	0.91	0.09	0.89	0.13			
CV.1se	0.03	0.00	0.03	0.00	0.02	0.00	0.55	0.02	0.18	0.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 76.0$
CV.min	0.45	0.01	0.32	0.01	0.15	0.00	0.85	0.04	0.47	0.01	
AICc	0.56	0.01	0.09	0.00	0.84	0.06	0.82	0.03			
AIC	0.91	0.13	0.92	0.11	0.92	0.09	0.90	0.12			
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	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 37.7$
CV.min	0.43	0.03	0.17	0.00	0.09	0.00	0.92	0.19	0.57	0.03	
AICc	0.54	0.03	0.86	0.09	0.95	0.09	0.87	0.07			
AIC	0.93	0.24	0.94	0.15	0.95	0.10	0.93	0.21			
BIC	0.93	0.23	0.94	0.15	0.95	0.10	0.92	0.21			
CV.1se	0.03	0.00	0.02	0.00	0.01	0.00	0.92	0.08	0.32	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 37.2$
CV.min	0.39	0.01	0.21	0.00	0.10	0.00	0.94	0.12	0.57	0.01	
AICc	0.53	0.01	0.38	0.03	0.96	0.07	0.92	0.04			
AIC	0.95	0.17	0.95	0.13	0.96	0.09	0.95	0.15			
BIC	0.95	0.17	0.95	0.12	0.96	0.08	0.95	0.15			
CV.1se	0.02	0.00	0.02	0.00	0.01	0.00	0.55	0.03	0.26	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 34.6$
CV.min	0.40	0.02	0.28	0.01	0.13	0.00	0.92	0.07	0.54	0.02	
AICc	0.53	0.02	0.07	0.00	0.95	0.08	0.88	0.04			
AIC	0.96	0.15	0.96	0.12	0.96	0.10	0.95	0.16			
BIC	0.96	0.15	0.96	0.12	0.96	0.10	0.74	0.09			
CV.1se	0.03	0.00	0.02	0.00	0.02	0.00	0.97	0.15	0.34	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 6.8$
CV.min	0.45	0.03	0.16	0.00	0.10	0.00	0.98	0.20	0.63	0.02	
AICc	0.59	0.03	0.98	0.10	0.99	0.10	0.96	0.08			
AIC	0.99	0.25	0.99	0.14	0.99	0.10	0.98	0.22			
BIC	0.98	0.25	0.99	0.14	0.99	0.10	0.98	0.22			
CV.1se	0.03	0.00	0.01	0.00	0.01	0.00	0.95	0.10	0.34	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 6.7$
CV.min	0.39	0.02	0.18	0.00	0.10	0.00	0.99	0.17	0.63	0.02	
AICc	0.55	0.02	0.82	0.07	0.99	0.09	0.96	0.06			
AIC	0.99	0.22	0.99	0.15	0.99	0.10	0.99	0.20			
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	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 6.4$
CV.min	0.41	0.04	0.23	0.01	0.11	0.00	0.95	0.16	0.60	0.04	
AICc	0.56	0.04	0.06	0.00	0.99	0.15	0.94	0.11			
AIC	0.99	0.24	0.99	0.20	0.99	0.16	0.99	0.26			
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.lse	0.03	0.00	0.02	0.00	0.01	0.00	0.82	0.10	0.25	0.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 91.1$
CV.min	0.43	0.03	0.14	0.00	0.07	0.00	0.85	0.14	0.57	0.03	
AICc	0.51	0.02	0.83	0.07	0.89	0.07	0.79	0.05			
AIC	0.86	0.18	0.88	0.12	0.89	0.08	0.85	0.16			
BIC	0.86	0.18	0.88	0.12	0.89	0.08	0.85	0.16			
CV.lse	0.02	0.00	0.02	0.00	0.00	0.00	0.86	0.06	0.27	0.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 91.1$
CV.min	0.40	0.01	0.18	0.00	0.09	0.00	0.88	0.10	0.54	0.01	
AICc	0.51	0.01	0.44	0.03	0.90	0.06	0.85	0.03			
AIC	0.89	0.14	0.89	0.11	0.90	0.08	0.89	0.12			
BIC	0.89	0.14	0.90	0.10	0.90	0.08	0.89	0.12			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.55	0.01	0.24	0.00	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 90.5$
CV.min	0.42	0.01	0.27	0.00	0.13	0.00	0.86	0.04	0.55	0.01	
AICc	0.52	0.01	0.07	0.00	0.90	0.07	0.83	0.02			
AIC	0.90	0.13	0.90	0.10	0.90	0.08	0.90	0.11			
BIC	0.90	0.12	0.90	0.10	0.90	0.08	0.75	0.06			
CV.lse	0.04	0.00	0.02	0.00	0.02	0.00	0.92	0.11	0.30	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 41.2$
CV.min	0.42	0.02	0.15	0.00	0.11	0.00	0.93	0.16	0.58	0.02	
AICc	0.58	0.02	0.94	0.08	0.95	0.08	0.90	0.06			
AIC	0.94	0.20	0.94	0.12	0.95	0.08	0.93	0.18			
BIC	0.94	0.20	0.95	0.12	0.95	0.08	0.93	0.18			
CV.lse	0.03	0.00	0.02	0.00	0.01	0.00	0.92	0.06	0.32	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 41.3$
CV.min	0.41	0.01	0.19	0.00	0.10	0.00	0.94	0.11	0.62	0.01	
AICc	0.54	0.01	0.71	0.05	0.95	0.07	0.92	0.04			
AIC	0.95	0.16	0.95	0.11	0.95	0.08	0.95	0.13			
BIC	0.95	0.16	0.95	0.11	0.95	0.08	0.95	0.13			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.55	0.02	0.29	0.00	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 39.9$
CV.min	0.39	0.01	0.25	0.01	0.10	0.00	0.92	0.06	0.57	0.01	
AICc	0.54	0.02	0.06	0.00	0.95	0.08	0.89	0.04			
AIC	0.95	0.15	0.95	0.12	0.96	0.10	0.95	0.15			
BIC	0.95	0.15	0.95	0.12	0.96	0.10	0.80	0.09			
CV.lse	0.02	0.00	0.02	0.00	0.02	0.00	0.98	0.12	0.33	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 5.4$
CV.min	0.43	0.01	0.14	0.00	0.10	0.00	0.99	0.17	0.64	0.02	
AICc	0.58	0.02	0.99	0.09	0.99	0.08	0.97	0.06			
AIC	0.99	0.21	0.99	0.13	0.99	0.08	0.99	0.18			
BIC	0.99	0.20	0.99	0.12	0.99	0.08	0.99	0.18			
CV.lse	0.03	0.00	0.02	0.00	0.01	0.00	0.95	0.09	0.33	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 5.5$
CV.min	0.41	0.02	0.16	0.00	0.10	0.00	0.99	0.15	0.63	0.01	
AICc	0.57	0.01	0.97	0.07	0.99	0.08	0.96	0.05			
AIC	0.99	0.21	0.99	0.12	0.99	0.09	0.99	0.18			
BIC	0.99	0.21	0.99	0.12	0.99	0.08	0.99	0.18			
CV.lse	0.01	0.00	0.01	0.00	0.01	0.00	0.57	0.04	0.33	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 5.3$
CV.min	0.40	0.02	0.23	0.01	0.11	0.00	0.97	0.12	0.61	0.03	
AICc	0.57	0.03	0.11	0.01	0.99	0.13	0.94	0.08			
AIC	0.99	0.23	0.99	0.18	0.99	0.15	0.99	0.22			
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.lse	0.44	0.66	0.28	0.65	0.05	0.44	0.72	0.81	0.17	0.65	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.80	0.88	0.65	0.86	0.21	0.67	0.85	0.87	0.46	0.82	
AICc	0.64	0.80	0.47	0.81	0.80	0.88	0.69	0.79			
AIC	0.91	0.93	0.90	0.92	0.88	0.88	0.89	0.88			
BIC	0.91	0.92	0.90	0.92	0.88	0.88	0.82	0.85			
CV.lse	0.42	0.55	0.27	0.56	0.05	0.36	0.76	0.78	0.17	0.60	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.80	0.83	0.66	0.82	0.20	0.60	0.86	0.84	0.44	0.80	
AICc	0.64	0.74	0.50	0.77	0.81	0.86	0.71	0.74			
AIC	0.92	0.92	0.91	0.92	0.88	0.87	0.90	0.86			
BIC	0.91	0.91	0.90	0.91	0.88	0.87	0.85	0.84			
CV.lse	0.42	0.51	0.30	0.52	0.05	0.33	0.77	0.75	0.19	0.57	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.80	0.80	0.68	0.78	0.22	0.55	0.87	0.82	0.47	0.75	
AICc	0.66	0.69	0.52	0.72	0.81	0.82	0.72	0.70			
AIC	0.92	0.89	0.91	0.89	0.89	0.83	0.90	0.84			
BIC	0.92	0.89	0.91	0.89	0.89	0.83	0.85	0.81			
CV.lse	0.12	0.10	0.08	0.07	0.02	0.03	0.84	0.56	0.13	0.10	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.64	0.40	0.39	0.25	0.13	0.10	0.91	0.62	0.54	0.36	
AICc	0.59	0.35	0.44	0.29	0.92	0.39	0.78	0.48			
AIC	0.94	0.66	0.94	0.58	0.94	0.42	0.93	0.64			
BIC	0.94	0.66	0.94	0.58	0.94	0.42	0.93	0.63			
CV.lse	0.10	0.07	0.07	0.05	0.03	0.03	0.86	0.51	0.13	0.07	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.62	0.34	0.40	0.22	0.11	0.09	0.92	0.58	0.51	0.30	
AICc	0.60	0.30	0.43	0.25	0.93	0.38	0.79	0.42			
AIC	0.94	0.63	0.94	0.56	0.95	0.40	0.94	0.60			
BIC	0.94	0.63	0.94	0.55	0.95	0.40	0.93	0.59			
CV.lse	0.11	0.07	0.07	0.05	0.02	0.03	0.86	0.48	0.14	0.08	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.62	0.32	0.41	0.21	0.13	0.09	0.92	0.56	0.51	0.28	
AICc	0.60	0.28	0.43	0.23	0.93	0.36	0.81	0.40			
AIC	0.94	0.61	0.94	0.55	0.95	0.38	0.94	0.58			
BIC	0.94	0.61	0.94	0.54	0.95	0.38	0.93	0.58			
CV.lse	0.04	0.00	0.02	0.00	0.01	0.00	0.94	0.26	0.26	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.42	0.07	0.24	0.02	0.11	0.01	0.96	0.32	0.56	0.07	
AICc	0.56	0.07	0.73	0.13	0.97	0.15	0.90	0.17			
AIC	0.97	0.36	0.97	0.27	0.98	0.17	0.96	0.34			
BIC	0.97	0.36	0.97	0.27	0.98	0.17	0.96	0.34			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.93	0.23	0.32	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.44	0.06	0.24	0.02	0.11	0.01	0.96	0.29	0.59	0.06	
AICc	0.55	0.06	0.70	0.11	0.97	0.14	0.91	0.15			
AIC	0.97	0.34	0.97	0.25	0.98	0.16	0.97	0.31			
BIC	0.97	0.33	0.97	0.25	0.98	0.16	0.97	0.31			
CV.lse	0.03	0.01	0.02	0.00	0.01	0.00	0.94	0.21	0.30	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.46	0.06	0.23	0.02	0.12	0.01	0.96	0.27	0.60	0.06	
AICc	0.56	0.06	0.65	0.10	0.97	0.14	0.92	0.14			
AIC	0.97	0.32	0.97	0.25	0.98	0.16	0.97	0.30			
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.lse	0.43	0.69	0.24	0.63	0.05	0.24	0.74	0.92	0.31	0.73	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.79	0.94	0.61	0.91	0.18	0.53	0.85	0.95	0.65	0.93	
AICc	0.63	0.88	0.47	0.92	0.81	0.90	0.68	0.88			
AIC	0.91	0.98	0.90	0.98	0.87	0.91	0.89	0.96			
BIC	0.91	0.98	0.90	0.98	0.87	0.91	0.87	0.95			
CV.lse	0.37	0.52	0.22	0.48	0.04	0.19	0.77	0.88	0.29	0.61	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.89	0.60	0.84	0.16	0.42	0.86	0.93	0.62	0.87	
AICc	0.63	0.79	0.52	0.89	0.82	0.88	0.71	0.83			
AIC	0.91	0.97	0.90	0.97	0.88	0.89	0.89	0.94			
BIC	0.91	0.97	0.90	0.97	0.88	0.89	0.88	0.94			
CV.lse	0.37	0.47	0.24	0.43	0.04	0.14	0.78	0.85	0.31	0.55	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.86	0.60	0.77	0.17	0.36	0.87	0.91	0.63	0.82	
AICc	0.64	0.75	0.55	0.84	0.82	0.83	0.72	0.79			
AIC	0.91	0.96	0.90	0.95	0.89	0.84	0.90	0.92			
BIC	0.91	0.95	0.90	0.95	0.88	0.84	0.89	0.91			
CV.lse	0.10	0.07	0.04	0.03	0.01	0.01	0.85	0.59	0.16	0.07	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.60	0.38	0.30	0.17	0.11	0.06	0.91	0.67	0.55	0.35	
AICc	0.56	0.32	0.61	0.36	0.93	0.37	0.78	0.49			
AIC	0.94	0.70	0.94	0.57	0.95	0.39	0.93	0.68			
BIC	0.94	0.70	0.94	0.57	0.95	0.38	0.93	0.68			
CV.lse	0.08	0.04	0.04	0.03	0.01	0.01	0.86	0.55	0.16	0.05	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.56	0.30	0.28	0.13	0.10	0.05	0.92	0.62	0.54	0.28	
AICc	0.56	0.27	0.60	0.31	0.94	0.33	0.79	0.43			
AIC	0.94	0.67	0.94	0.55	0.95	0.35	0.93	0.64			
BIC	0.94	0.67	0.94	0.54	0.95	0.35	0.93	0.64			
CV.lse	0.08	0.04	0.04	0.02	0.02	0.01	0.87	0.51	0.19	0.06	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.56	0.28	0.29	0.12	0.11	0.04	0.92	0.59	0.56	0.26	
AICc	0.57	0.25	0.59	0.28	0.94	0.33	0.81	0.41			
AIC	0.94	0.65	0.94	0.53	0.95	0.35	0.93	0.62			
BIC	0.94	0.65	0.94	0.53	0.95	0.35	0.93	0.61			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.93	0.26	0.29	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.44	0.06	0.20	0.01	0.10	0.01	0.96	0.32	0.56	0.06	
AICc	0.54	0.06	0.92	0.17	0.97	0.14	0.91	0.16			
AIC	0.97	0.37	0.97	0.25	0.98	0.15	0.96	0.34			
BIC	0.97	0.36	0.97	0.25	0.98	0.15	0.96	0.34			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.94	0.23	0.32	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.05	0.19	0.01	0.10	0.01	0.96	0.30	0.59	0.05	
AICc	0.55	0.05	0.89	0.15	0.98	0.13	0.91	0.15			
AIC	0.97	0.34	0.97	0.23	0.98	0.15	0.97	0.32			
BIC	0.97	0.34	0.97	0.23	0.98	0.14	0.97	0.32			
CV.lse	0.03	0.00	0.03	0.00	0.01	0.00	0.94	0.21	0.30	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.46	0.06	0.21	0.01	0.10	0.01	0.96	0.28	0.61	0.05	
AICc	0.58	0.05	0.90	0.14	0.98	0.13	0.92	0.14			
AIC	0.97	0.33	0.98	0.23	0.98	0.15	0.97	0.30			
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.lse	0.43	0.68	0.23	0.62	0.05	0.23	0.74	0.92	0.32	0.72	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.79	0.94	0.60	0.90	0.16	0.49	0.85	0.96	0.65	0.92	
AICc	0.63	0.88	0.47	0.93	0.82	0.90	0.69	0.89			
AIC	0.91	0.98	0.90	0.98	0.87	0.90	0.89	0.96			
BIC	0.91	0.98	0.89	0.98	0.87	0.90	0.87	0.96			
CV.lse	0.37	0.51	0.21	0.47	0.04	0.16	0.77	0.89	0.29	0.61	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.77	0.88	0.59	0.83	0.15	0.40	0.86	0.94	0.64	0.87	
AICc	0.63	0.79	0.51	0.90	0.82	0.87	0.71	0.83			
AIC	0.91	0.97	0.90	0.97	0.88	0.88	0.89	0.94			
BIC	0.91	0.97	0.90	0.97	0.88	0.88	0.88	0.94			
CV.lse	0.37	0.46	0.22	0.41	0.04	0.14	0.78	0.86	0.30	0.54	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.86	0.59	0.76	0.16	0.34	0.87	0.91	0.64	0.83	
AICc	0.64	0.75	0.55	0.85	0.83	0.82	0.72	0.80			
AIC	0.91	0.96	0.90	0.95	0.89	0.83	0.90	0.92			
BIC	0.91	0.95	0.90	0.95	0.88	0.83	0.88	0.92			
CV.lse	0.10	0.06	0.04	0.03	0.01	0.01	0.85	0.60	0.17	0.07	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.59	0.38	0.29	0.15	0.11	0.05	0.91	0.67	0.56	0.34	
AICc	0.55	0.32	0.65	0.38	0.93	0.37	0.78	0.49			
AIC	0.94	0.71	0.94	0.57	0.95	0.38	0.93	0.69			
BIC	0.94	0.71	0.94	0.57	0.95	0.38	0.93	0.68			
CV.lse	0.07	0.04	0.04	0.03	0.01	0.01	0.86	0.55	0.18	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.56	0.30	0.27	0.12	0.10	0.05	0.92	0.63	0.55	0.28	
AICc	0.56	0.27	0.62	0.33	0.94	0.34	0.79	0.44			
AIC	0.94	0.67	0.94	0.54	0.95	0.36	0.93	0.64			
BIC	0.94	0.67	0.94	0.54	0.95	0.36	0.93	0.64			
CV.lse	0.08	0.04	0.04	0.02	0.02	0.01	0.87	0.52	0.17	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.56	0.28	0.28	0.12	0.09	0.04	0.92	0.59	0.55	0.26	
AICc	0.57	0.24	0.61	0.30	0.94	0.33	0.81	0.41			
AIC	0.94	0.65	0.94	0.52	0.95	0.35	0.93	0.62			
BIC	0.94	0.65	0.94	0.52	0.95	0.34	0.93	0.61			
CV.lse	0.03	0.00	0.02	0.00	0.01	0.00	0.93	0.26	0.30	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.44	0.06	0.21	0.01	0.10	0.01	0.96	0.32	0.57	0.06	
AICc	0.54	0.06	0.93	0.17	0.97	0.14	0.91	0.16			
AIC	0.97	0.37	0.97	0.24	0.98	0.15	0.96	0.34			
BIC	0.97	0.36	0.97	0.24	0.98	0.15	0.96	0.34			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.94	0.23	0.30	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.05	0.18	0.01	0.10	0.01	0.96	0.30	0.59	0.05	
AICc	0.56	0.05	0.92	0.15	0.98	0.13	0.91	0.15			
AIC	0.97	0.34	0.97	0.24	0.98	0.15	0.97	0.32			
BIC	0.97	0.34	0.97	0.23	0.98	0.14	0.97	0.32			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.94	0.21	0.31	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.46	0.05	0.20	0.01	0.10	0.01	0.96	0.28	0.61	0.05	
AICc	0.57	0.05	0.91	0.14	0.98	0.13	0.92	0.14			
AIC	0.97	0.33	0.98	0.22	0.98	0.14	0.97	0.30			
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.lse	0.43	0.69	0.23	0.61	0.05	0.23	0.74	0.92	0.32	0.72	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.79	0.94	0.59	0.90	0.17	0.50	0.85	0.96	0.65	0.92	
AICc	0.63	0.88	0.47	0.93	0.82	0.89	0.69	0.89			
AIC	0.91	0.98	0.90	0.98	0.87	0.90	0.89	0.96			
BIC	0.91	0.98	0.89	0.98	0.87	0.90	0.87	0.96			
CV.lse	0.36	0.52	0.20	0.46	0.03	0.16	0.77	0.89	0.29	0.61	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.77	0.89	0.58	0.82	0.15	0.40	0.86	0.94	0.64	0.88	
AICc	0.63	0.80	0.51	0.91	0.82	0.88	0.71	0.84			
AIC	0.91	0.97	0.90	0.97	0.88	0.88	0.89	0.94			
BIC	0.91	0.97	0.90	0.97	0.87	0.88	0.88	0.94			
CV.lse	0.38	0.47	0.22	0.42	0.04	0.14	0.78	0.86	0.30	0.55	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.86	0.59	0.76	0.16	0.34	0.87	0.91	0.64	0.83	
AICc	0.64	0.74	0.55	0.85	0.83	0.82	0.72	0.80			
AIC	0.91	0.96	0.90	0.95	0.89	0.83	0.90	0.92			
BIC	0.91	0.95	0.90	0.95	0.88	0.83	0.89	0.92			
CV.lse	0.10	0.07	0.04	0.03	0.02	0.01	0.85	0.59	0.17	0.07	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.59	0.38	0.28	0.15	0.11	0.06	0.91	0.67	0.55	0.34	
AICc	0.55	0.32	0.67	0.38	0.93	0.37	0.78	0.49			
AIC	0.94	0.71	0.94	0.57	0.95	0.38	0.93	0.68			
BIC	0.94	0.70	0.94	0.57	0.95	0.38	0.93	0.68			
CV.lse	0.08	0.04	0.04	0.03	0.02	0.01	0.87	0.54	0.17	0.05	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.55	0.30	0.27	0.12	0.10	0.04	0.92	0.62	0.53	0.28	
AICc	0.56	0.26	0.64	0.33	0.94	0.34	0.79	0.43			
AIC	0.94	0.67	0.94	0.54	0.95	0.35	0.93	0.64			
BIC	0.94	0.67	0.94	0.54	0.95	0.35	0.93	0.64			
CV.lse	0.08	0.04	0.04	0.02	0.02	0.01	0.87	0.52	0.19	0.05	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.56	0.28	0.28	0.11	0.10	0.04	0.92	0.60	0.56	0.25	
AICc	0.56	0.24	0.64	0.30	0.94	0.33	0.81	0.41			
AIC	0.94	0.65	0.94	0.52	0.95	0.35	0.93	0.62			
BIC	0.94	0.65	0.94	0.52	0.95	0.34	0.93	0.61			
CV.lse	0.03	0.00	0.02	0.00	0.02	0.00	0.94	0.26	0.28	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.06	0.20	0.01	0.10	0.01	0.96	0.32	0.58	0.06	
AICc	0.54	0.06	0.94	0.17	0.97	0.14	0.91	0.16			
AIC	0.97	0.37	0.97	0.24	0.98	0.15	0.96	0.34			
BIC	0.97	0.36	0.97	0.23	0.98	0.15	0.96	0.34			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.94	0.23	0.31	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.05	0.18	0.01	0.10	0.01	0.96	0.30	0.58	0.05	
AICc	0.56	0.05	0.92	0.15	0.98	0.13	0.91	0.15			
AIC	0.97	0.34	0.97	0.23	0.98	0.15	0.97	0.32			
BIC	0.97	0.34	0.97	0.23	0.98	0.14	0.97	0.32			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.94	0.21	0.31	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.46	0.05	0.21	0.01	0.10	0.01	0.96	0.28	0.61	0.06	
AICc	0.58	0.05	0.92	0.15	0.98	0.12	0.92	0.14			
AIC	0.97	0.33	0.98	0.22	0.98	0.14	0.97	0.30			
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.lse	0.42	0.64	0.26	0.63	0.05	0.42	0.72	0.81	0.16	0.64	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.87	0.64	0.85	0.18	0.64	0.85	0.87	0.44	0.81	
AICc	0.63	0.79	0.34	0.73	0.65	0.81	0.69	0.79			
AIC	0.91	0.92	0.90	0.92	0.88	0.88	0.89	0.88			
BIC	0.91	0.92	0.90	0.92	0.88	0.88	0.81	0.85			
CV.lse	0.11	0.07	0.11	0.09	0.03	0.08	0.85	0.34	0.10	0.16	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.69	0.26	0.57	0.24	0.16	0.16	0.93	0.44	0.39	0.29	
AICc	0.66	0.24	0.22	0.15	0.61	0.35	0.84	0.29			
AIC	0.95	0.57	0.94	0.57	0.94	0.48	0.94	0.48			
BIC	0.95	0.57	0.94	0.56	0.94	0.48	0.83	0.42			
CV.lse	0.12	0.10	0.09	0.10	0.04	0.11	0.64	0.24	0.04	0.12	sd( $\mu$ )/ $\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.71	0.15	0.61	0.14	0.23	0.13	0.86	0.42	0.32	0.15	
AICc	0.72	0.14	0.21	0.11	0.02	0.10	0.82	0.31			
AIC	0.97	0.28	0.97	0.26	0.97	0.23	0.90	0.56			
BIC	0.93	0.27	0.95	0.26	0.97	0.23	0.34	0.13			
CV.lse	0.11	0.10	0.07	0.07	0.02	0.04	0.84	0.55	0.11	0.09	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.61	0.38	0.39	0.25	0.12	0.10	0.91	0.61	0.51	0.34	
AICc	0.60	0.36	0.14	0.14	0.92	0.41	0.77	0.47			
AIC	0.94	0.66	0.94	0.57	0.94	0.42	0.93	0.63			
BIC	0.94	0.65	0.94	0.57	0.94	0.42	0.92	0.63			
CV.lse	0.05	0.02	0.05	0.02	0.02	0.02	0.89	0.24	0.15	0.04	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.54	0.12	0.40	0.09	0.15	0.05	0.95	0.31	0.46	0.11	
AICc	0.63	0.13	0.13	0.05	0.91	0.22	0.88	0.19			
AIC	0.96	0.39	0.97	0.34	0.97	0.26	0.96	0.35			
BIC	0.96	0.38	0.97	0.34	0.97	0.25	0.94	0.34			
CV.lse	0.07	0.06	0.07	0.07	0.03	0.08	0.51	0.12	0.04	0.08	sd( $\mu$ )/ $\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.66	0.12	0.56	0.11	0.20	0.10	0.89	0.20	0.28	0.11	
AICc	0.68	0.12	0.16	0.10	0.03	0.09	0.84	0.14			
AIC	0.98	0.24	0.98	0.22	0.98	0.18	0.95	0.41			
BIC	0.97	0.24	0.98	0.22	0.98	0.18	0.38	0.12			
CV.lse	0.04	0.01	0.02	0.00	0.01	0.00	0.93	0.25	0.27	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.07	0.24	0.03	0.12	0.01	0.96	0.31	0.58	0.07	
AICc	0.54	0.08	0.19	0.03	0.97	0.15	0.90	0.17			
AIC	0.97	0.36	0.97	0.27	0.98	0.17	0.96	0.33			
BIC	0.97	0.35	0.97	0.26	0.98	0.17	0.96	0.33			
CV.lse	0.03	0.00	0.03	0.00	0.01	0.00	0.93	0.13	0.29	0.01	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.03	0.29	0.02	0.14	0.01	0.97	0.18	0.60	0.03	
AICc	0.57	0.04	0.08	0.01	0.98	0.11	0.93	0.09			
AIC	0.98	0.23	0.98	0.19	0.98	0.13	0.98	0.21			
BIC	0.98	0.23	0.98	0.18	0.98	0.13	0.98	0.21			
CV.lse	0.03	0.01	0.03	0.01	0.01	0.01	0.58	0.07	0.18	0.02	sd( $\mu$ )/ $\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.48	0.06	0.39	0.05	0.16	0.03	0.93	0.13	0.51	0.06	
AICc	0.61	0.07	0.10	0.03	0.69	0.09	0.89	0.10			
AIC	0.98	0.21	0.98	0.18	0.98	0.14	0.97	0.25			
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.lse	0.41	0.65	0.23	0.61	0.05	0.26	0.73	0.91	0.28	0.71	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.93	0.59	0.90	0.17	0.56	0.84	0.94	0.61	0.91	
AICc	0.63	0.87	0.33	0.83	0.76	0.89	0.68	0.88			
AIC	0.91	0.97	0.90	0.97	0.87	0.90	0.89	0.95			
BIC	0.91	0.97	0.90	0.97	0.87	0.90	0.86	0.94			
CV.lse	0.07	0.04	0.06	0.04	0.02	0.03	0.86	0.39	0.15	0.07	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.60	0.23	0.44	0.17	0.15	0.08	0.93	0.49	0.49	0.22	
AICc	0.63	0.22	0.14	0.09	0.91	0.36	0.83	0.32			
AIC	0.95	0.60	0.94	0.56	0.95	0.40	0.94	0.53			
BIC	0.95	0.60	0.94	0.55	0.95	0.40	0.93	0.52			
CV.lse	0.26	0.10	0.23	0.11	0.13	0.12	0.69	0.19	0.12	0.14	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.20	0.73	0.17	0.33	0.15	0.90	0.26	0.34	0.18	
AICc	0.77	0.19	0.32	0.14	0.18	0.14	0.84	0.21			
AIC	0.97	0.32	0.97	0.29	0.97	0.23	0.95	0.43			
BIC	0.97	0.32	0.97	0.29	0.97	0.23	0.61	0.19			
CV.lse	0.10	0.07	0.05	0.04	0.01	0.02	0.84	0.58	0.15	0.07	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.58	0.37	0.29	0.17	0.11	0.06	0.91	0.66	0.54	0.34	
AICc	0.57	0.33	0.16	0.12	0.93	0.38	0.77	0.49			
AIC	0.94	0.69	0.94	0.57	0.95	0.39	0.93	0.67			
BIC	0.94	0.69	0.94	0.57	0.94	0.39	0.92	0.67			
CV.lse	0.04	0.01	0.03	0.01	0.02	0.01	0.91	0.26	0.19	0.02	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.48	0.10	0.32	0.06	0.13	0.02	0.95	0.34	0.55	0.09	
AICc	0.57	0.10	0.12	0.03	0.96	0.19	0.88	0.20			
AIC	0.96	0.40	0.97	0.34	0.97	0.22	0.96	0.37			
BIC	0.96	0.40	0.97	0.34	0.97	0.22	0.96	0.37			
CV.lse	0.09	0.03	0.09	0.03	0.05	0.03	0.68	0.13	0.17	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.60	0.12	0.54	0.10	0.24	0.07	0.92	0.20	0.50	0.11	
AICc	0.68	0.12	0.16	0.05	0.46	0.10	0.88	0.16			
AIC	0.98	0.28	0.98	0.24	0.98	0.19	0.96	0.32			
BIC	0.97	0.28	0.98	0.24	0.97	0.19	0.68	0.17			
CV.lse	0.03	0.01	0.02	0.00	0.02	0.00	0.93	0.25	0.25	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.42	0.07	0.21	0.02	0.11	0.01	0.96	0.32	0.55	0.06	
AICc	0.55	0.07	0.51	0.09	0.97	0.14	0.90	0.17			
AIC	0.97	0.36	0.97	0.25	0.98	0.16	0.96	0.34			
BIC	0.97	0.36	0.97	0.25	0.98	0.15	0.96	0.34			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.93	0.13	0.28	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.44	0.03	0.26	0.01	0.13	0.00	0.97	0.19	0.59	0.03	
AICc	0.56	0.03	0.12	0.01	0.98	0.10	0.93	0.08			
AIC	0.98	0.24	0.98	0.18	0.98	0.12	0.98	0.21			
BIC	0.98	0.23	0.98	0.18	0.98	0.12	0.98	0.21			
CV.lse	0.03	0.00	0.02	0.00	0.02	0.00	0.62	0.05	0.30	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.45	0.03	0.33	0.02	0.15	0.01	0.94	0.11	0.61	0.03	
AICc	0.60	0.04	0.08	0.00	0.95	0.11	0.91	0.08			
AIC	0.98	0.21	0.98	0.17	0.98	0.13	0.98	0.20			
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.lse	0.41	0.66	0.22	0.61	0.04	0.25	0.73	0.91	0.29	0.72	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.78	0.94	0.58	0.89	0.17	0.52	0.84	0.94	0.62	0.91	
AICc	0.63	0.87	0.33	0.84	0.78	0.89	0.69	0.89			
AIC	0.91	0.97	0.90	0.97	0.87	0.90	0.89	0.95			
BIC	0.91	0.97	0.90	0.97	0.87	0.90	0.86	0.95			
CV.lse	0.07	0.04	0.06	0.04	0.02	0.02	0.86	0.39	0.16	0.06	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.59	0.23	0.43	0.17	0.14	0.07	0.93	0.50	0.50	0.22	
AICc	0.62	0.22	0.14	0.09	0.91	0.36	0.83	0.33			
AIC	0.95	0.60	0.94	0.55	0.95	0.39	0.94	0.54			
BIC	0.95	0.60	0.94	0.55	0.95	0.39	0.93	0.52			
CV.lse	0.27	0.10	0.24	0.11	0.13	0.11	0.69	0.19	0.14	0.14	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.79	0.20	0.73	0.17	0.33	0.15	0.89	0.26	0.37	0.18	
AICc	0.77	0.20	0.33	0.14	0.20	0.15	0.84	0.22			
AIC	0.97	0.32	0.97	0.29	0.97	0.23	0.95	0.42			
BIC	0.97	0.32	0.97	0.29	0.97	0.23	0.64	0.20			
CV.lse	0.10	0.07	0.04	0.04	0.02	0.02	0.84	0.59	0.14	0.07	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.58	0.37	0.28	0.16	0.10	0.06	0.91	0.66	0.54	0.34	
AICc	0.57	0.33	0.18	0.12	0.93	0.37	0.77	0.49			
AIC	0.94	0.70	0.94	0.56	0.95	0.39	0.93	0.67			
BIC	0.94	0.69	0.94	0.56	0.94	0.39	0.93	0.67			
CV.lse	0.04	0.01	0.03	0.01	0.02	0.01	0.91	0.26	0.25	0.02	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.47	0.09	0.30	0.05	0.13	0.02	0.95	0.34	0.56	0.09	
AICc	0.57	0.10	0.11	0.02	0.96	0.19	0.88	0.20			
AIC	0.96	0.40	0.97	0.34	0.97	0.21	0.96	0.37			
BIC	0.96	0.40	0.97	0.33	0.97	0.21	0.96	0.37			
CV.lse	0.09	0.02	0.10	0.02	0.05	0.03	0.70	0.13	0.22	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.59	0.11	0.53	0.09	0.25	0.06	0.92	0.20	0.54	0.11	
AICc	0.68	0.12	0.17	0.04	0.56	0.12	0.88	0.16			
AIC	0.97	0.28	0.98	0.24	0.98	0.19	0.96	0.31			
BIC	0.97	0.28	0.98	0.24	0.98	0.19	0.69	0.18			
CV.lse	0.03	0.01	0.02	0.00	0.02	0.00	0.93	0.25	0.26	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.42	0.06	0.21	0.02	0.10	0.01	0.96	0.32	0.57	0.06	
AICc	0.56	0.07	0.56	0.10	0.97	0.14	0.90	0.17			
AIC	0.97	0.36	0.97	0.25	0.98	0.16	0.96	0.34			
BIC	0.97	0.36	0.97	0.24	0.98	0.15	0.96	0.34			
CV.lse	0.02	0.00	0.02	0.00	0.01	0.00	0.93	0.12	0.30	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.03	0.25	0.01	0.13	0.00	0.97	0.18	0.61	0.03	
AICc	0.56	0.03	0.15	0.01	0.98	0.10	0.93	0.08			
AIC	0.98	0.23	0.98	0.18	0.98	0.12	0.98	0.21			
BIC	0.98	0.23	0.98	0.18	0.98	0.11	0.98	0.21			
CV.lse	0.02	0.00	0.02	0.00	0.02	0.00	0.62	0.05	0.28	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.45	0.03	0.33	0.02	0.14	0.01	0.94	0.11	0.59	0.03	
AICc	0.60	0.03	0.07	0.00	0.97	0.11	0.91	0.07			
AIC	0.98	0.21	0.98	0.17	0.98	0.13	0.98	0.20			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.79	0.94	0.58	0.90	0.16	0.54	0.84	0.95	0.61	0.91	
AICc	0.63	0.87	0.32	0.84	0.79	0.90	0.69	0.89			
AIC	0.91	0.98	0.90	0.97	0.87	0.91	0.89	0.95			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.59	0.23	0.42	0.16	0.14	0.07	0.93	0.50	0.49	0.21	
AICc	0.62	0.22	0.14	0.09	0.91	0.35	0.83	0.33			
AIC	0.95	0.60	0.94	0.55	0.95	0.38	0.94	0.54			
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	$\text{sd}(\mu)/\sigma = 2$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.79	0.20	0.72	0.17	0.33	0.15	0.89	0.26	0.37	0.18	
AICc	0.77	0.20	0.34	0.14	0.23	0.15	0.84	0.22			
AIC	0.97	0.32	0.97	0.29	0.97	0.23	0.95	0.41			
BIC	0.97	0.32	0.97	0.29	0.97	0.23	0.64	0.21			
CV.1se	0.10	0.07	0.04	0.04	0.01	0.02	0.84	0.59	0.15	0.07	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.58	0.38	0.28	0.16	0.11	0.06	0.91	0.66	0.53	0.35	
AICc	0.56	0.33	0.19	0.13	0.93	0.37	0.77	0.49			
AIC	0.94	0.70	0.94	0.56	0.95	0.39	0.93	0.67			
BIC	0.94	0.70	0.94	0.56	0.94	0.38	0.92	0.67			
CV.1se	0.04	0.01	0.03	0.01	0.02	0.01	0.90	0.26	0.23	0.02	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.48	0.10	0.30	0.05	0.13	0.02	0.95	0.34	0.56	0.09	
AICc	0.58	0.10	0.10	0.02	0.96	0.19	0.88	0.20			
AIC	0.96	0.41	0.97	0.34	0.97	0.21	0.96	0.37			
BIC	0.96	0.40	0.97	0.33	0.97	0.21	0.96	0.37			
CV.1se	0.09	0.02	0.09	0.02	0.05	0.03	0.70	0.13	0.22	0.05	$\text{sd}(\mu)/\sigma = 1$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.59	0.11	0.53	0.10	0.25	0.06	0.92	0.20	0.53	0.11	
AICc	0.68	0.12	0.17	0.04	0.58	0.12	0.88	0.17			
AIC	0.97	0.28	0.98	0.24	0.98	0.20	0.96	0.31			
BIC	0.97	0.28	0.98	0.24	0.97	0.20	0.72	0.18			
CV.1se	0.03	0.01	0.02	0.00	0.01	0.00	0.93	0.25	0.25	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.42	0.06	0.20	0.02	0.10	0.01	0.96	0.32	0.56	0.06	
AICc	0.55	0.07	0.58	0.11	0.97	0.14	0.90	0.17			
AIC	0.97	0.36	0.97	0.24	0.98	0.15	0.96	0.34			
BIC	0.97	0.36	0.97	0.24	0.98	0.15	0.96	0.34			
CV.1se	0.02	0.00	0.02	0.00	0.01	0.00	0.93	0.12	0.30	0.00	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.5$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.43	0.03	0.25	0.01	0.13	0.00	0.97	0.18	0.62	0.03	
AICc	0.56	0.03	0.16	0.01	0.98	0.10	0.93	0.08			
AIC	0.98	0.23	0.98	0.18	0.98	0.11	0.98	0.21			
BIC	0.98	0.23	0.98	0.17	0.98	0.11	0.98	0.21			
CV.1se	0.03	0.00	0.02	0.00	0.01	0.00	0.61	0.05	0.28	0.01	$\text{sd}(\mu)/\sigma = 0.5$ $\rho = 0.9$ $\bar{s}_{Oracle} = 10.0$
CV.min	0.45	0.03	0.33	0.02	0.15	0.01	0.93	0.10	0.60	0.03	
AICc	0.60	0.03	0.08	0.00	0.97	0.11	0.91	0.07			
AIC	0.98	0.20	0.98	0.17	0.98	0.13	0.98	0.20			
BIC	0.98	0.20	0.98	0.17	0.98	0.12	0.83	0.12			