# Contents

# 1 Introduction

This document contains all of the figures and tables of the results from our simulation study. Our simulation study used a factorial using the following features as factors:

- The choice of response function (linear or non-linear)
- $n$, the number of observations (50, 200, and 1000),
- $p$, the number of predictors (10, 100, and 2000),
- $\sigma$, the standard deviation of the random error (1, 3, and 6),
- The correlation matrix structure (independent, symmetric compound, autoregressive, and blockwise), and
- $\rho$, the correlation between predictors (0.2, 0.5, and 0.9)

The differences among the last three factors can be displayed in a single figure or table. However, each figure only uses a particular value for $n$ and $p$; furthermore, each figure only shows the results for one metric for either the linear or non-linear response function.

The four metrics we computed were the **training mean squared error**, **test mean squared error**, $\beta$**-sensitivity** and $\beta$**-specificity**. The training mean squared error measures how well each model can make predictions using data that was used to train the model. The test mean squared error assesses how well each model makes predictions on data that was not used to train the model. $\beta$-sensitivity measures the ability for a model that performs variable selection to recognize predictors that are actually related to the response, while $\beta$-specificity measures how well models can recognize predictors that are not related to the response.

The models that were fitted using a linear response used the function

$$\mathbf{y} = 1 + 2\mathbf{X}_1 - 2\mathbf{X}_2 + 0.5\mathbf{X}_5 + 3\mathbf{X}_6 + \mathbf{e} \tag{1}$$

where $\mathbf{e}$ is a random error with mean 0 and standard deviation $\sigma$ (recall that $\sigma$ is one of our factors).

Our non-linear response function used

$$\mathbf{y} = 6 \times 1_{\mathbf{X}_1 > 0} + \mathbf{X}_2^2 + 0.5\mathbf{X}_6 + 3\mathbf{X}_7 + 2 \times 1_{\mathbf{X}_8 > 0} \times 1_{\mathbf{X}_9 > 0} + \mathbf{e} \tag{2}$$

where $1_{\mathbf{X}_i > 0}$ is the index function defined by

$$1_{\mathbf{X}_i > 0} = \begin{cases} 0, & \mathbf{X}_i \leq 0 \\ 1, & \mathbf{X}_i > 0 \end{cases} \tag{3}$$

All of the figures appear in this document before any tables. Each section contains the figures or tables for one type of response function, while each subsection contains the figures or tables from one of the metrics we considered. The caption for each figure has a hyperlink to the corresponding table, while each table has a link back to the figure it refers to.

# 2 Figures from the linear simulations

## 2.1 Figures for the average training MSE of the linear simulations

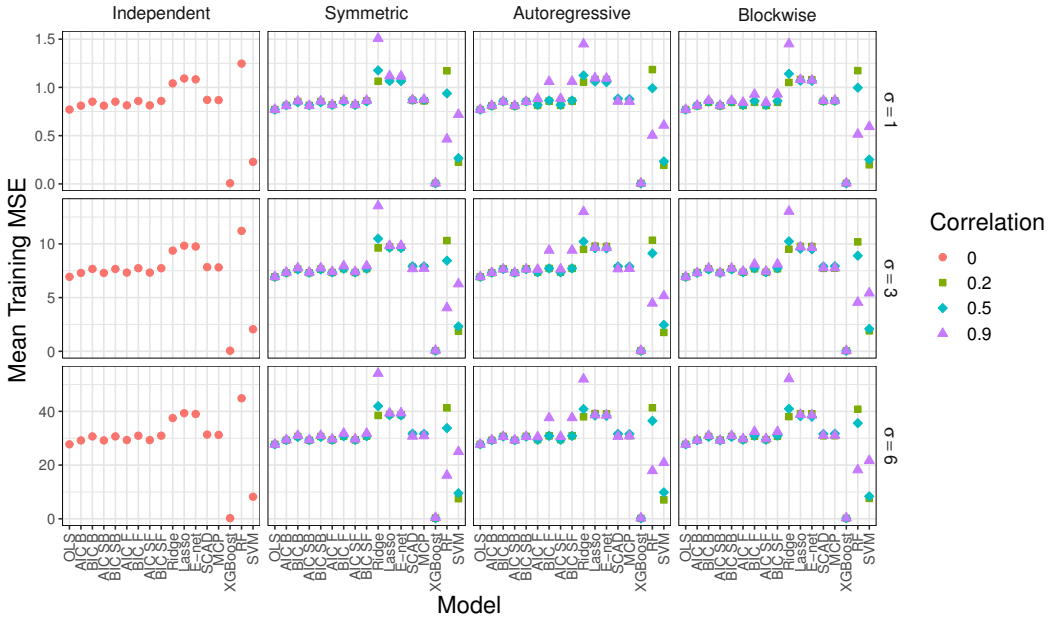


Figure 1: Average training MSE for the linear simulations when $n = 50$ and $p = 10$. See Table 1 for the corresponding data.

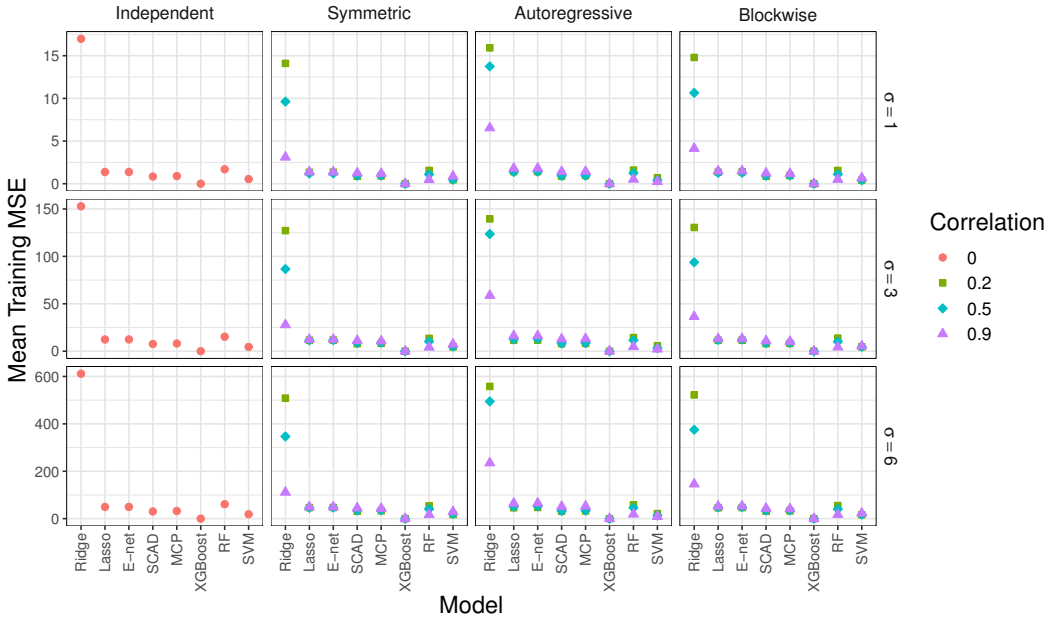


Figure 2: Average training MSE for the linear simulations when $n = 50$ and $p = 100$. See Table 2 for the corresponding data.

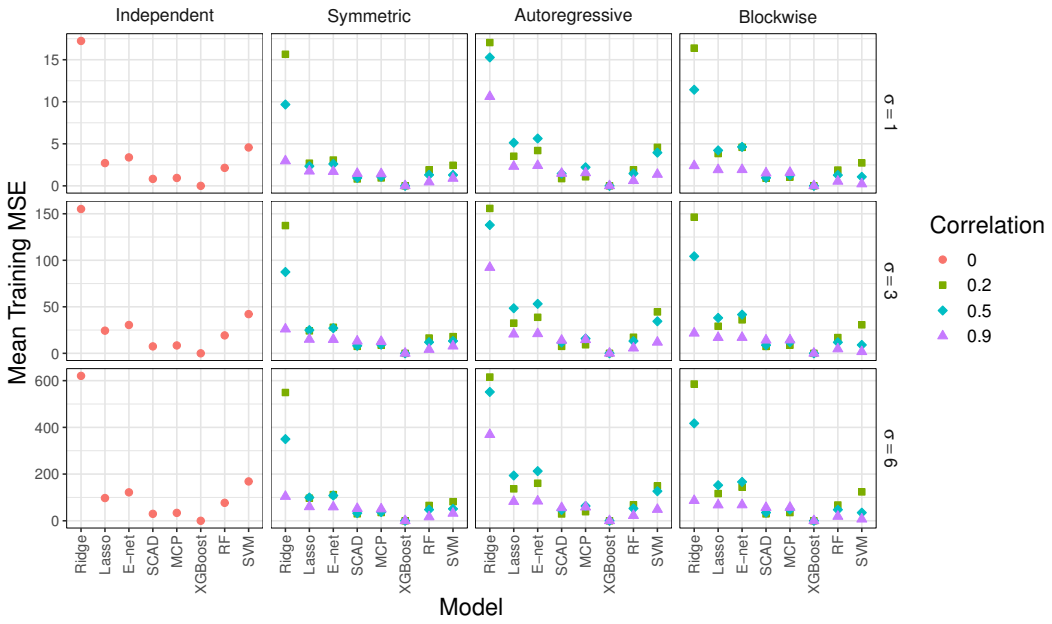


Figure 3: Average training MSE for the linear simulations when $n = 50$ and $p = 2000$. See Table 3 for the corresponding data.

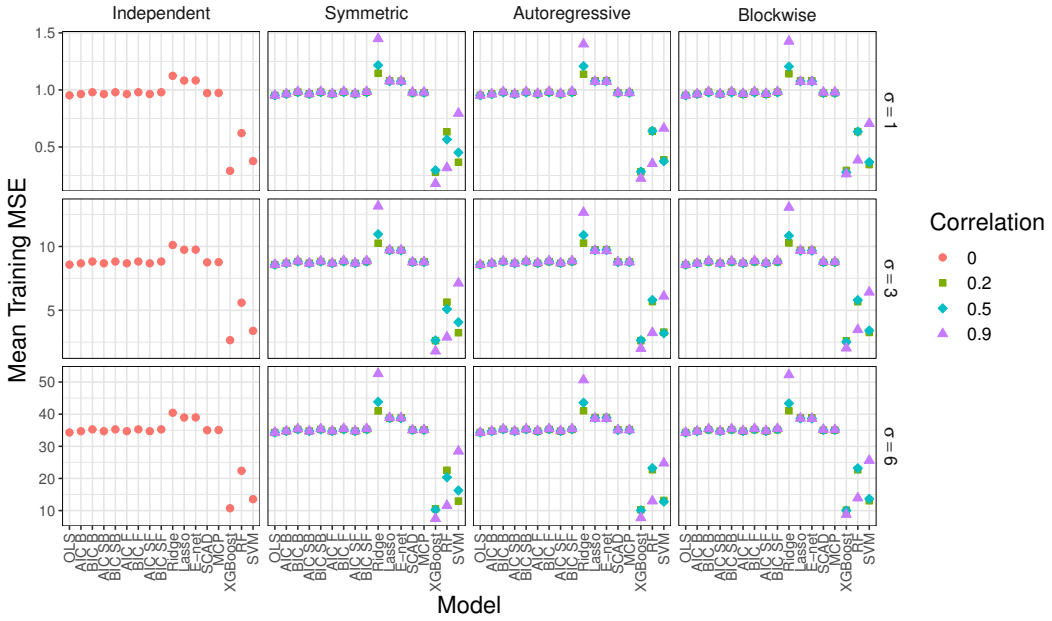


Figure 4: Average training MSE for the linear simulations when $n = 200$ and $p = 10$. See Table 4 for the corresponding data.

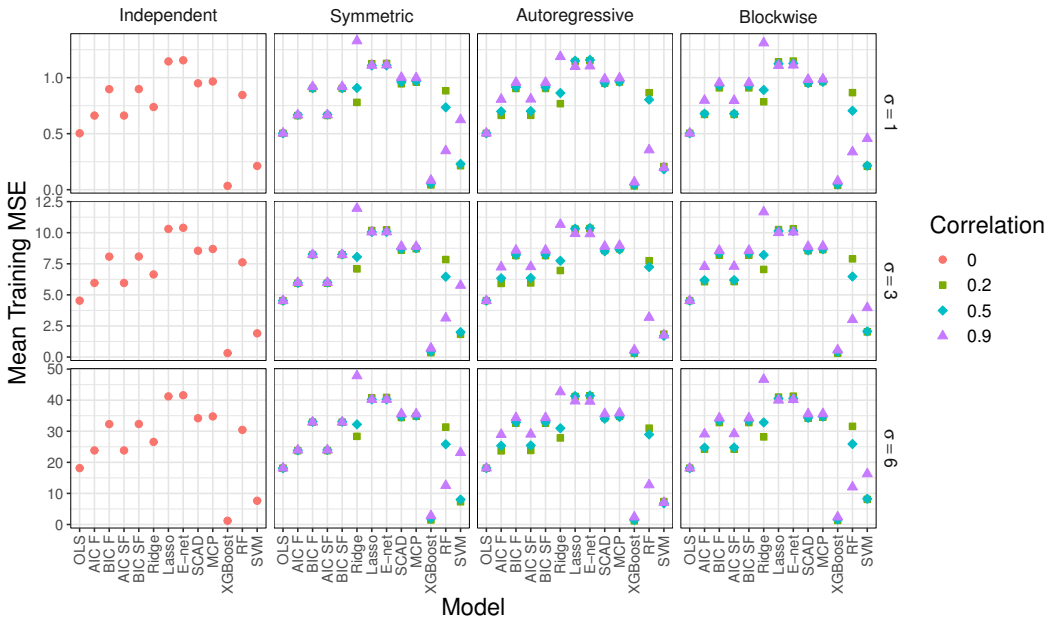


Figure 5: Average training MSE for the linear simulations when $n = 200$ and $p = 100$. See Table 5 for the corresponding data.

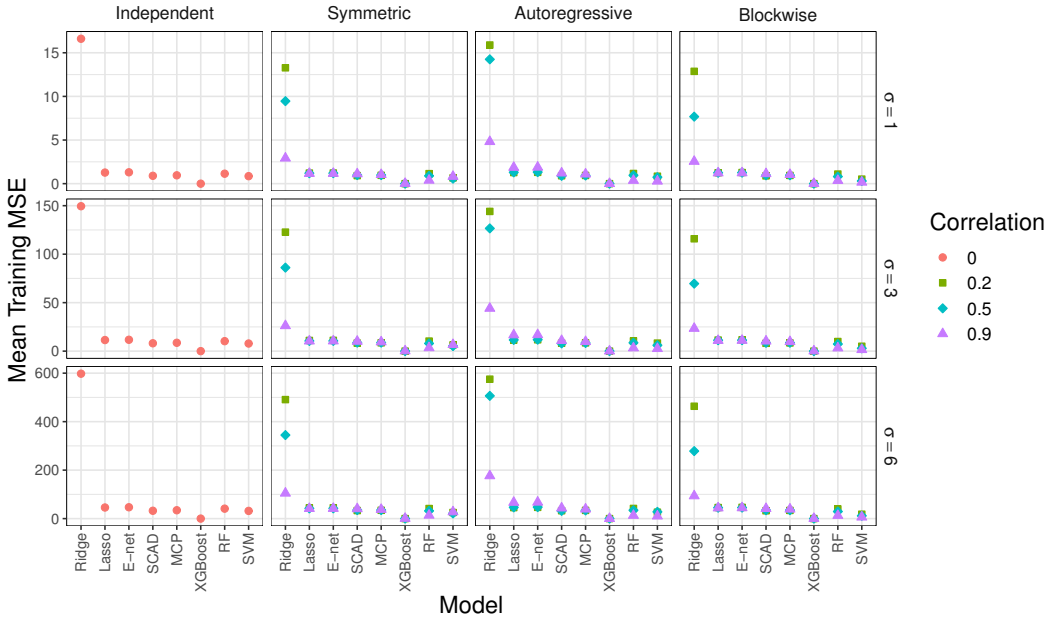


Figure 6: Average training MSE for the linear simulations when $n = 200$ and $p = 2000$. See Table 6 for the corresponding data.

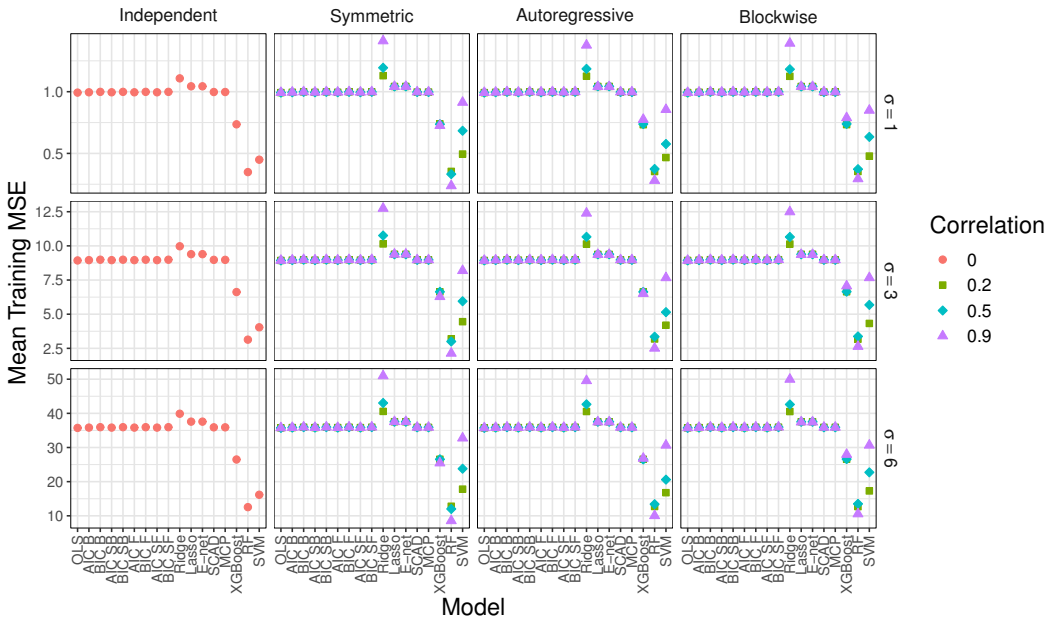


Figure 7: Average training MSE for the linear simulations when $n = 1000$ and $p = 10$. See Table 7 for the corresponding data.

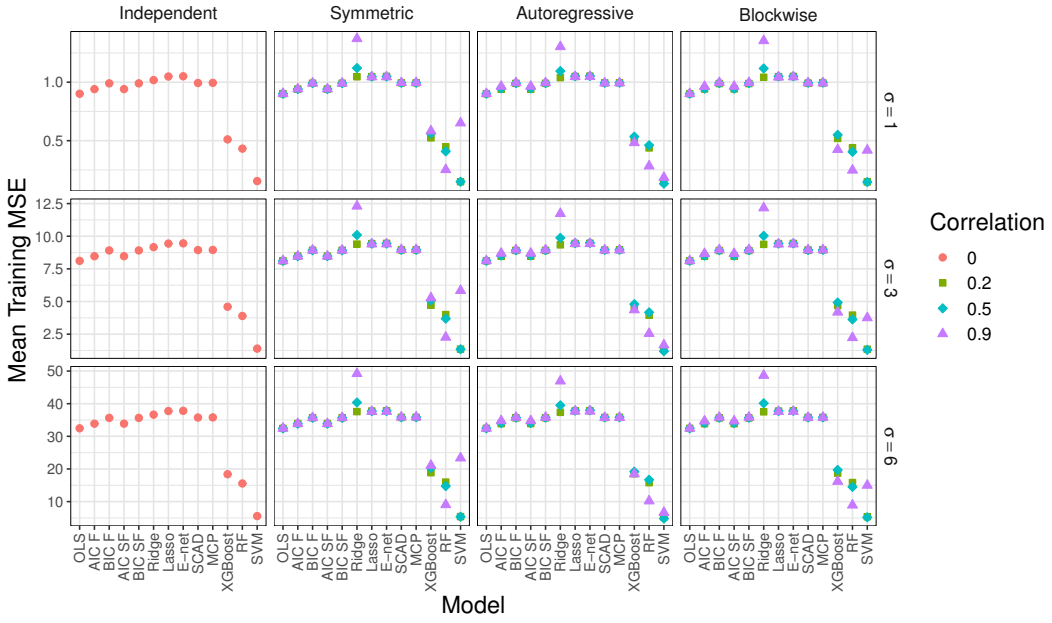


Figure 8: Average training MSE for the linear simulations when $n = 1000$ and $p = 100$. See Table 8 for the corresponding data.

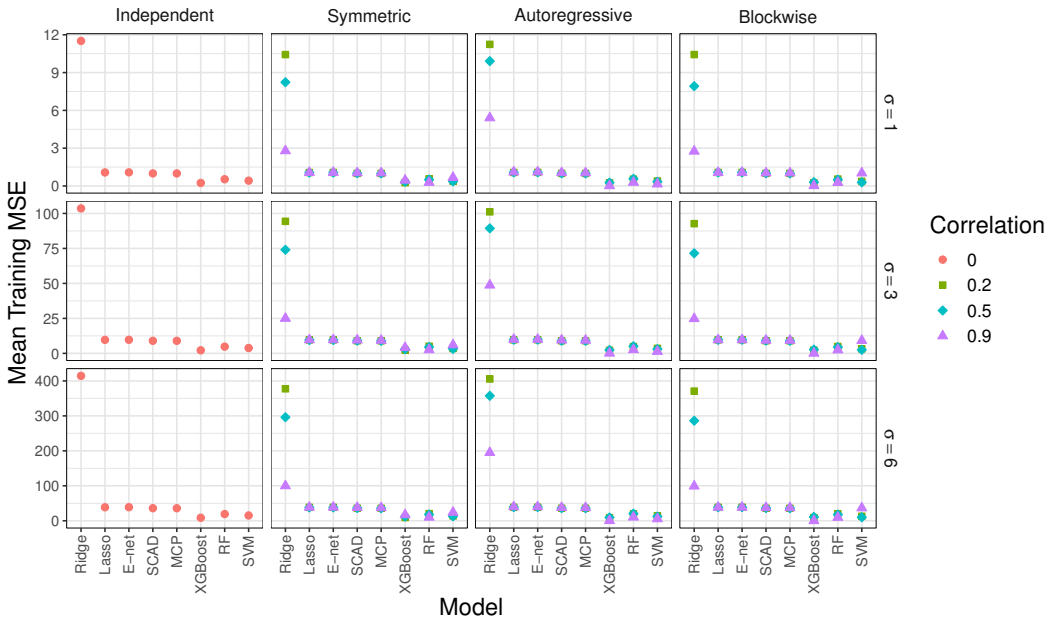


Figure 9: Average training MSE for the linear simulations when $n = 1000$ and $p = 2000$. See Table 9 for the corresponding data.

## 2.2 Figures for the average testing MSE of the linear simulations

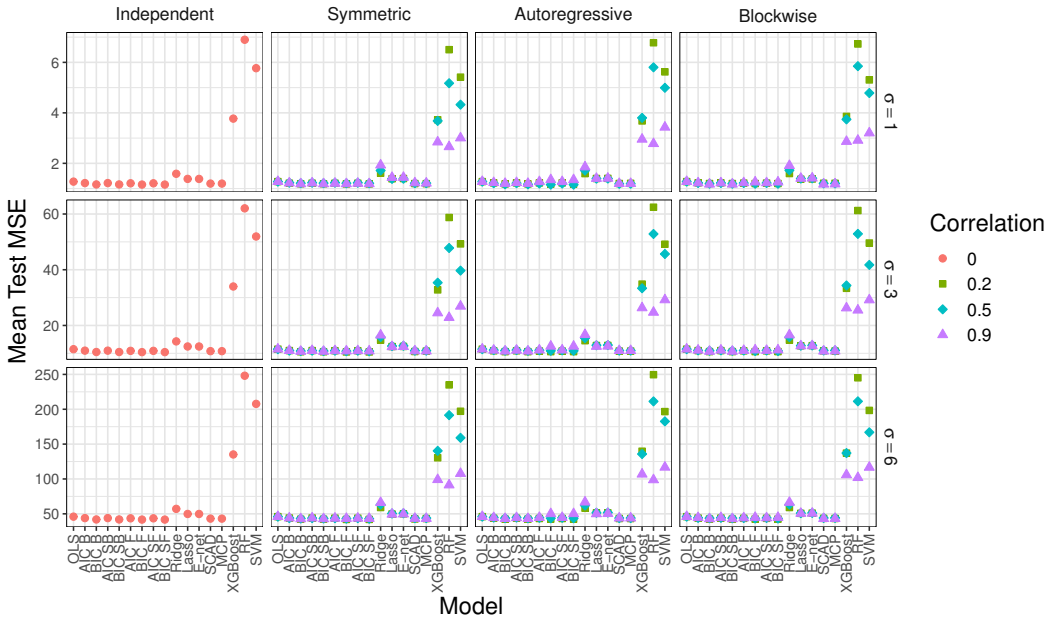


Figure 10: Average testing MSE for the linear simulations when $n = 50$ and $p = 10$. See Table 10 for the corresponding data.

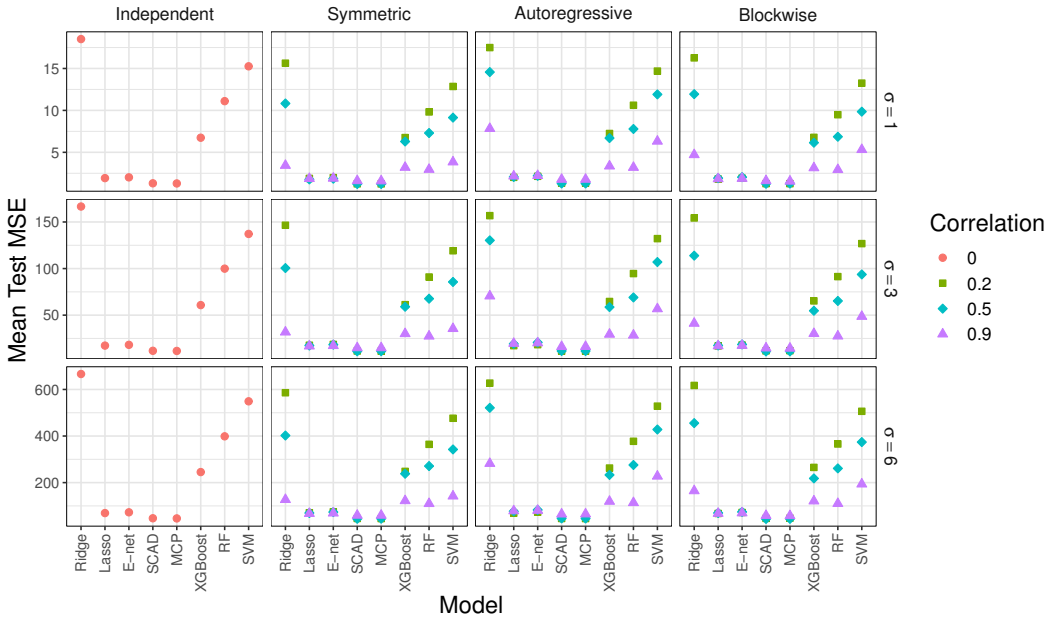


Figure 11: Average testing MSE for the linear simulations when $n = 50$ and $p = 100$. See Table 11 for the corresponding data.

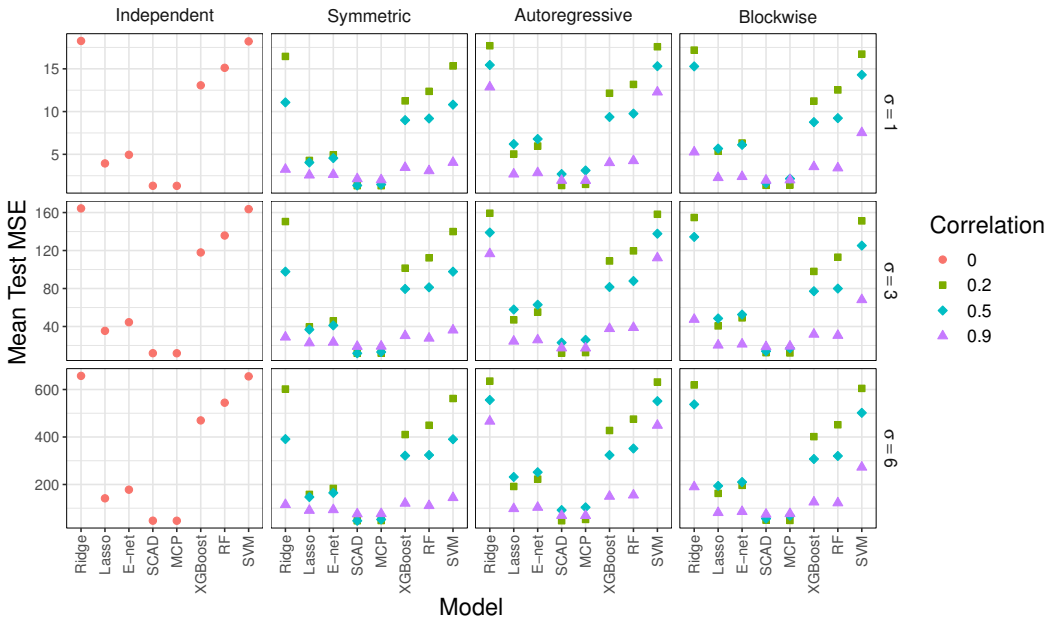


Figure 12: Average testing MSE for the linear simulations when $n = 50$ and $p = 2000$. See Table 12 for the corresponding data.

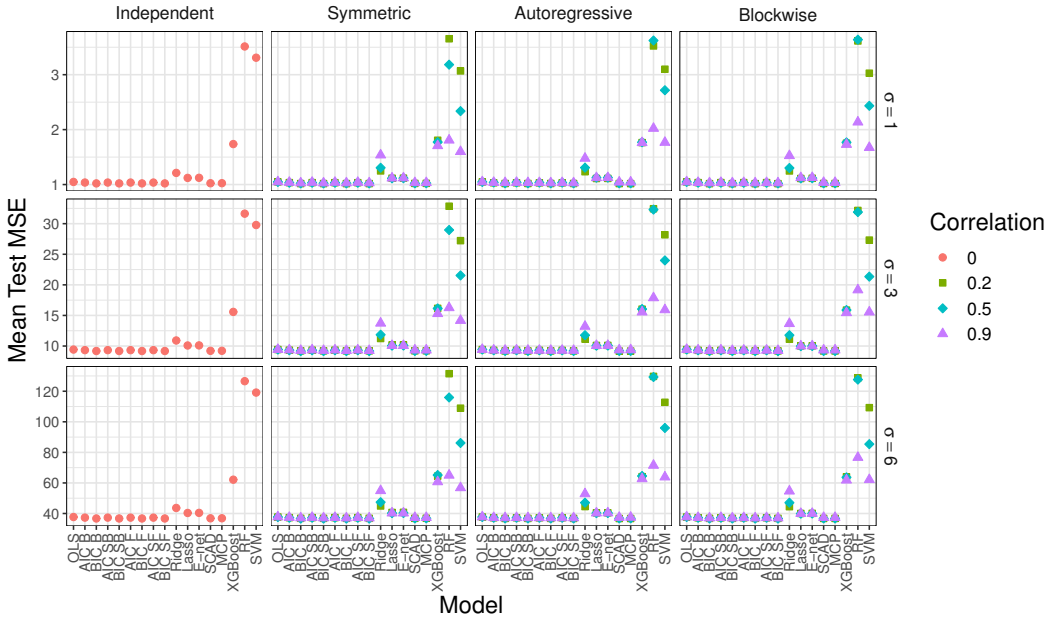


Figure 13: Average testing MSE for the linear simulations when $n = 200$ and $p = 10$. See Table 13 for the corresponding data.

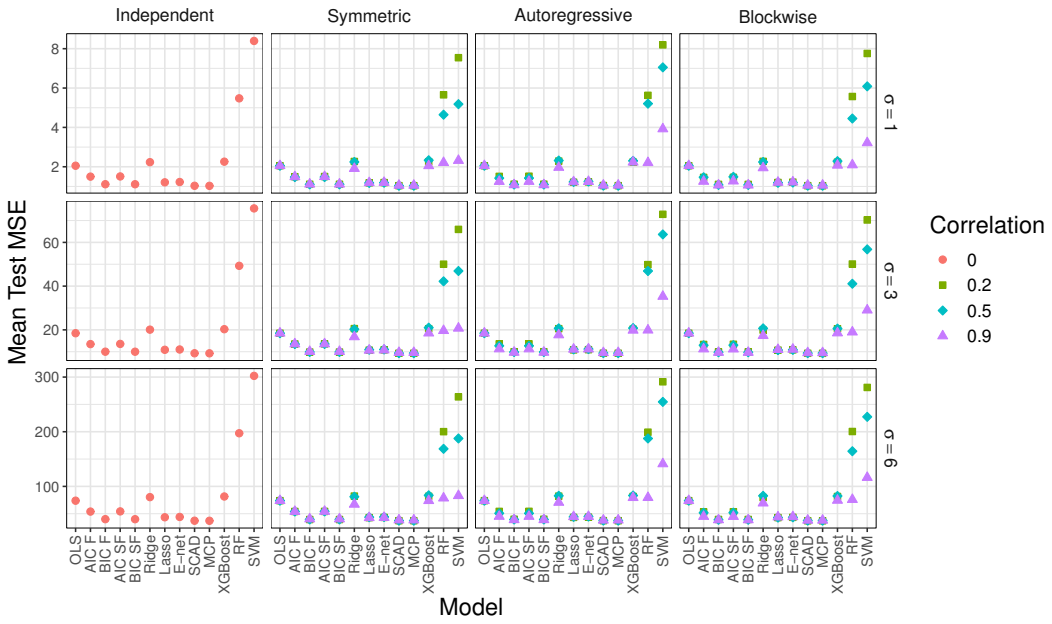


Figure 14: Average testing MSE for the linear simulations when $n = 200$ and $p = 100$. See Table 14 for the corresponding data.

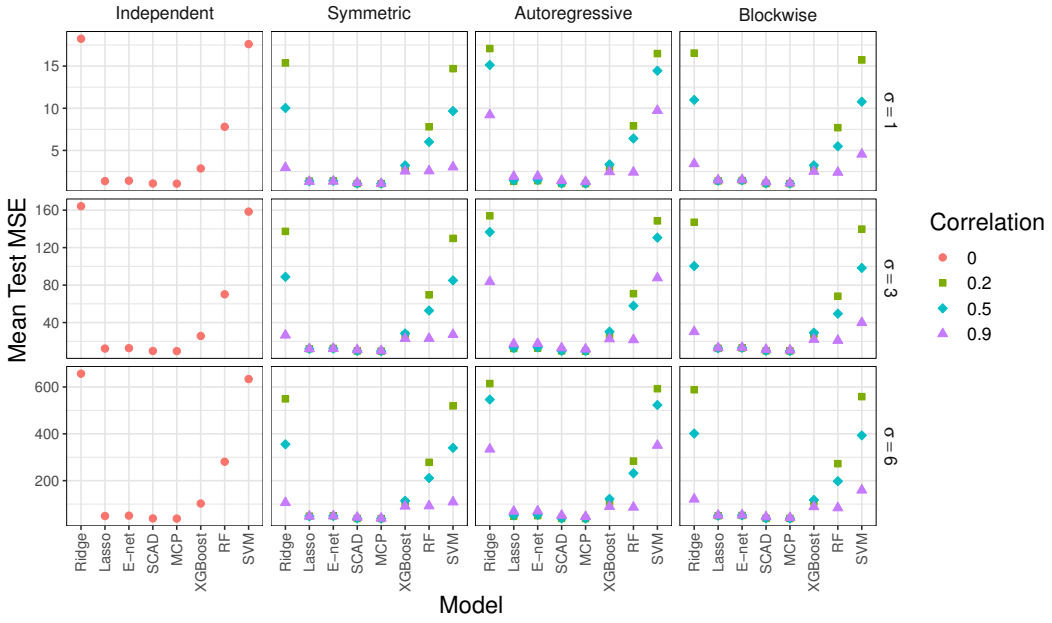


Figure 15: Average testing MSE for the linear simulations when $n = 200$ and $p = 2000$. See Table 15 for the corresponding data.

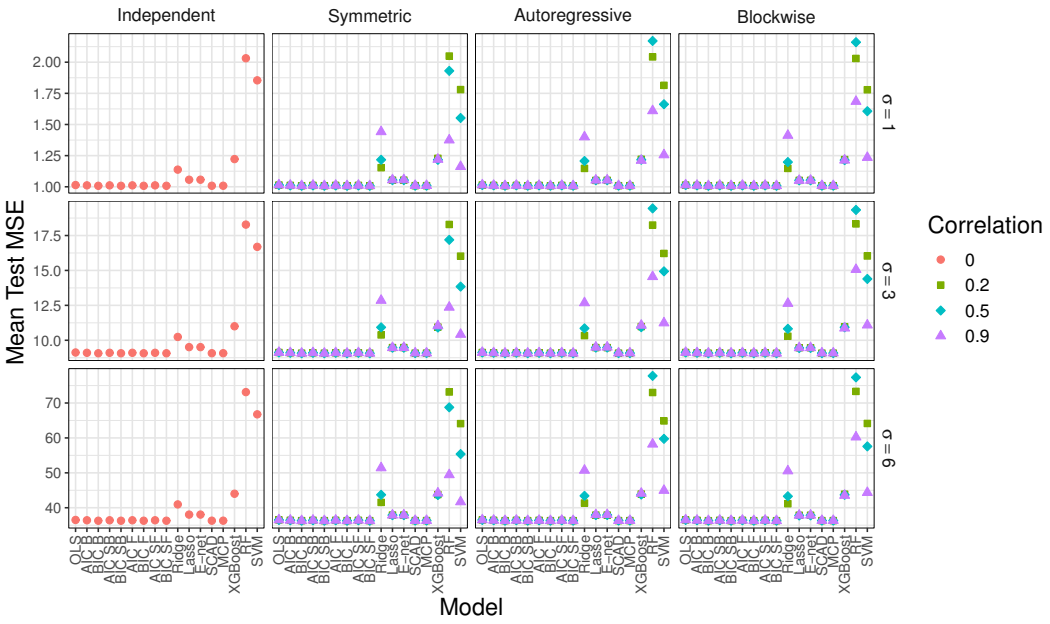


Figure 16: Average testing MSE for the linear simulations when $n = 1000$ and $p = 10$. See Table 16 for the corresponding data.

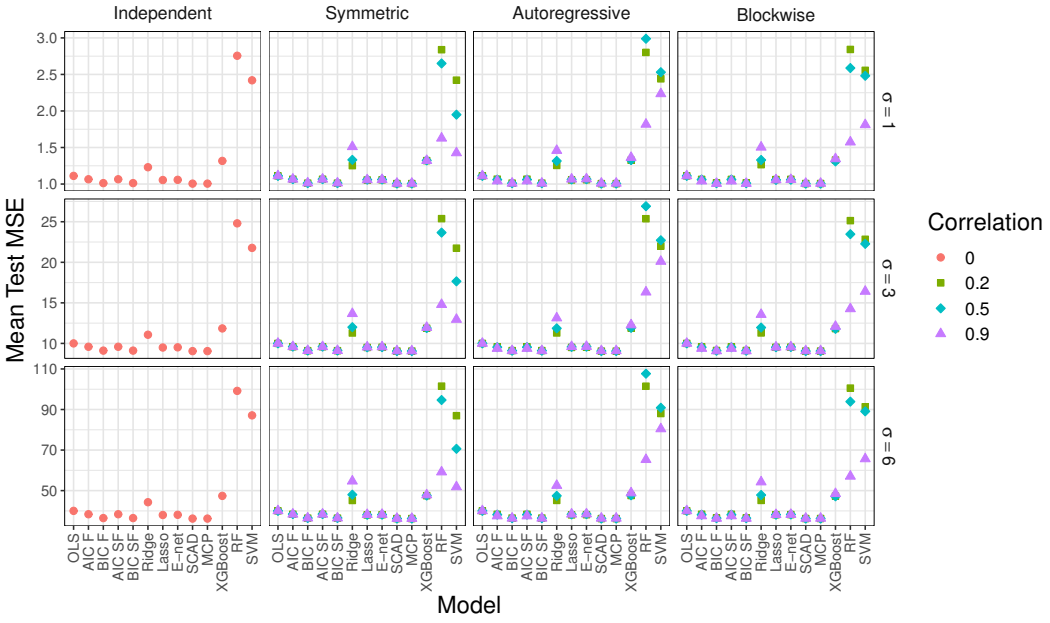


Figure 17: Average testing MSE for the linear simulations when $n = 1000$ and $p = 100$. See Table 17 for the corresponding data.

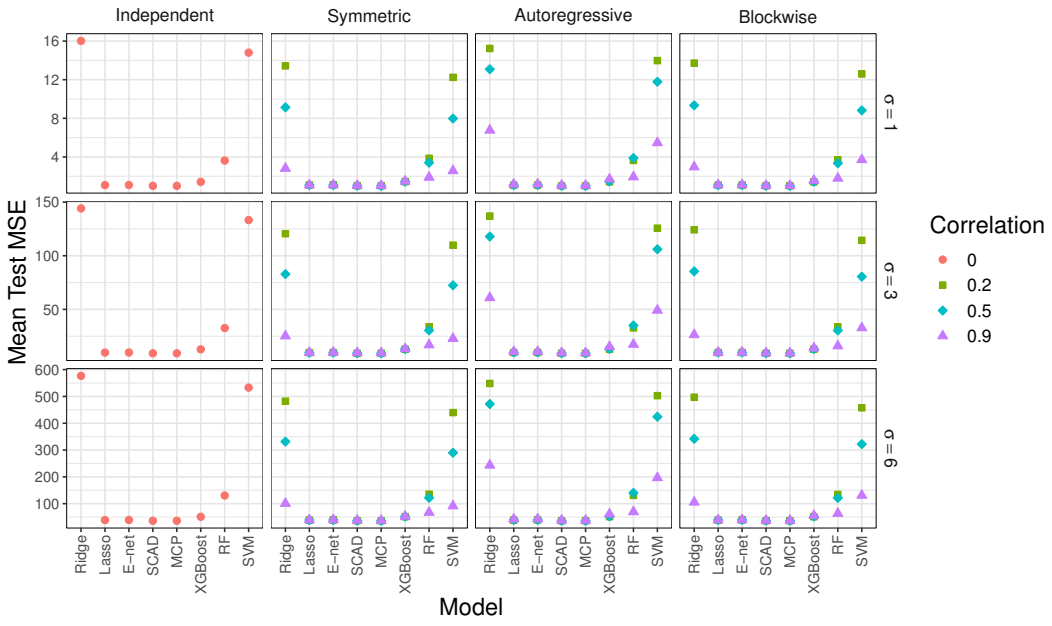


Figure 18: Average testing MSE for the linear simulations when $n = 1000$ and $p = 2000$. See Table 18 for the corresponding data.

## 2.3 Figures for the average $\beta$-sensitivity of the linear simulations

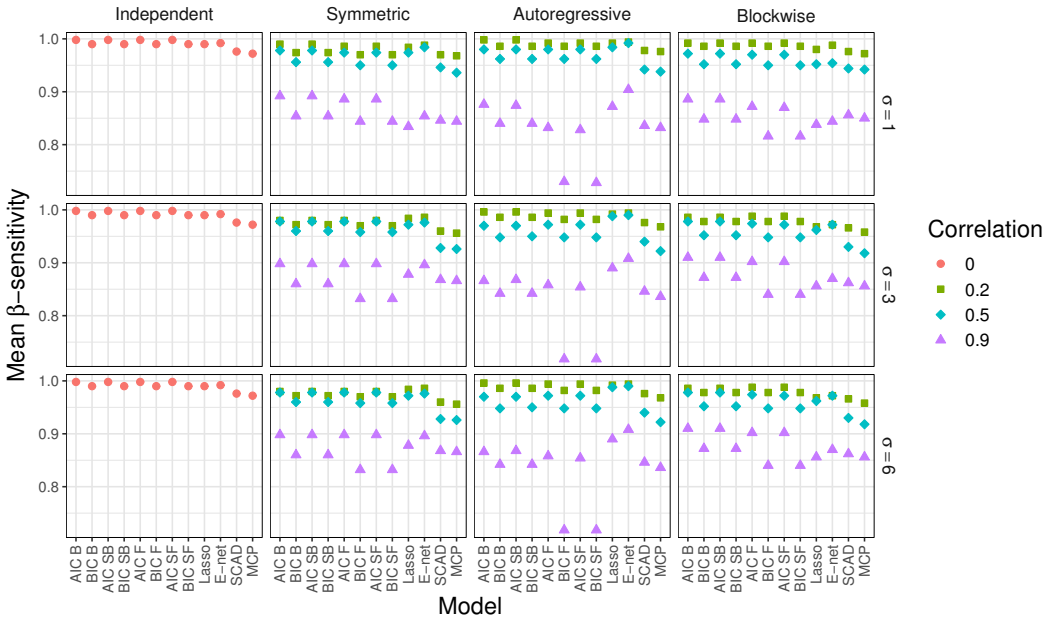


Figure 19: Average $\beta$-sensitivity for the linear simulations when $n = 50$ and $p = 10$. See Table 19 for the corresponding data.

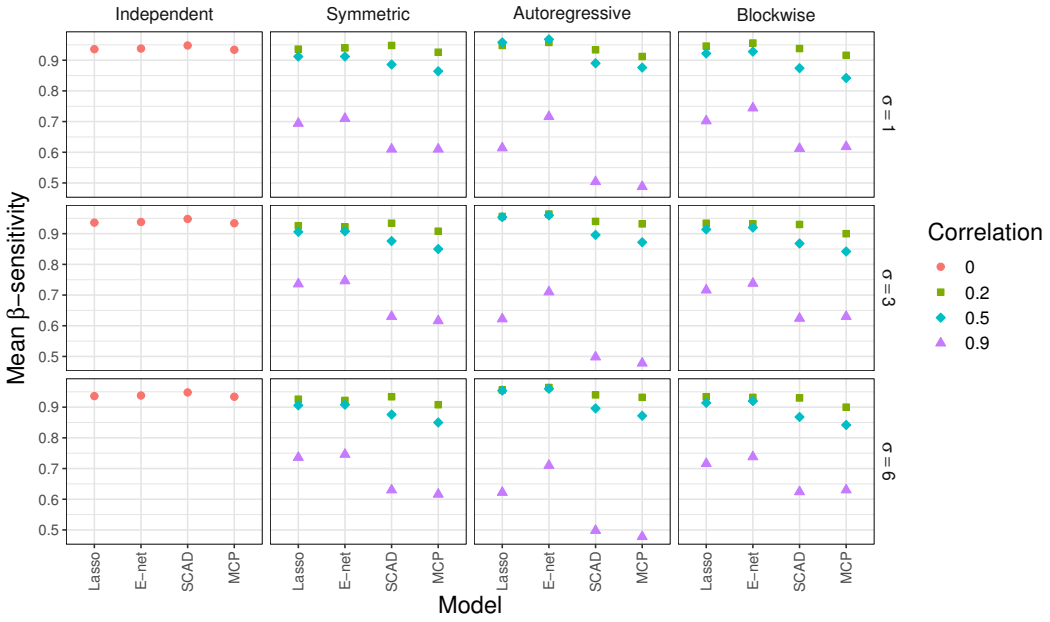


Figure 20: Average $\beta$-sensitivity for the linear simulations when $n = 50$ and $p = 100$. See Table 20 for the corresponding data.

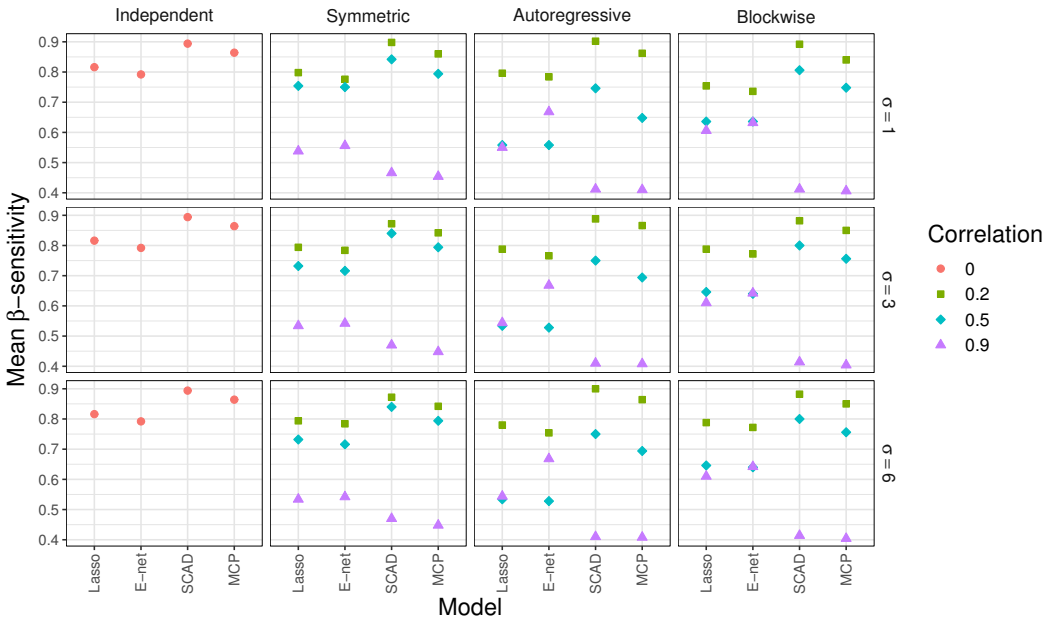


Figure 21: Average $\beta$-sensitivity for the linear simulations when $n = 50$ and $p = 2000$. See Table 21 for the corresponding data.

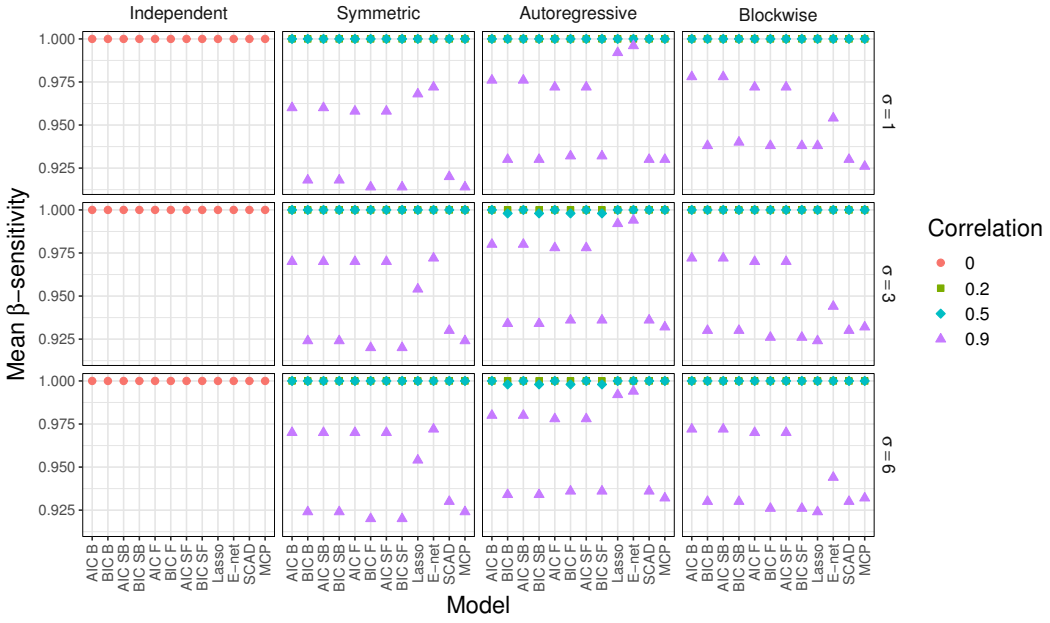


Figure 22: Average $\beta$-sensitivity for the linear simulations when $n = 200$ and $p = 10$. See Table 22 for the corresponding data.

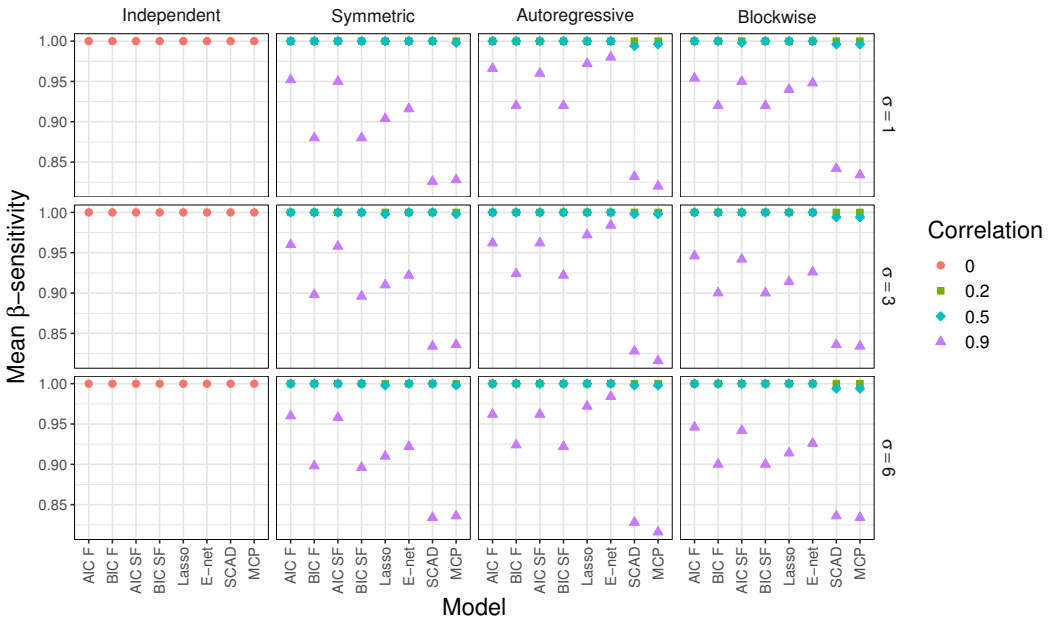


Figure 23: Average $\beta$-sensitivity for the linear simulations when $n = 200$ and $p = 100$. See Table 23 for the corresponding data.

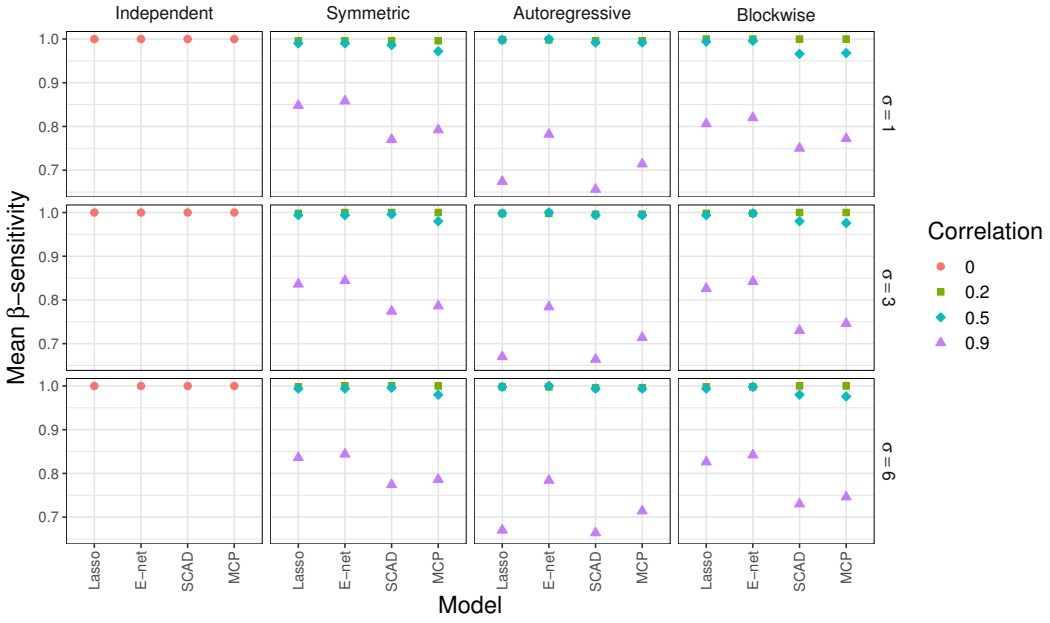


Figure 24: Average $\beta$-sensitivity for the linear simulations when $n = 200$ and $p = 2000$. See Table 24 for the corresponding data.

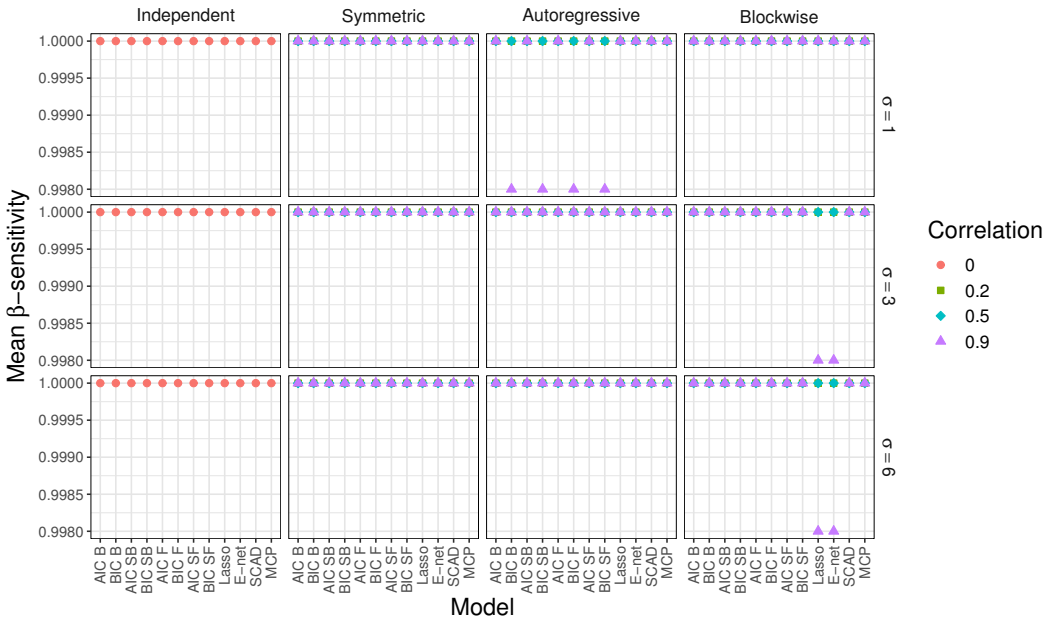


Figure 25: Average $\beta$-sensitivity for the linear simulations when $n = 1000$ and $p = 10$. See Table 25 for the corresponding data.

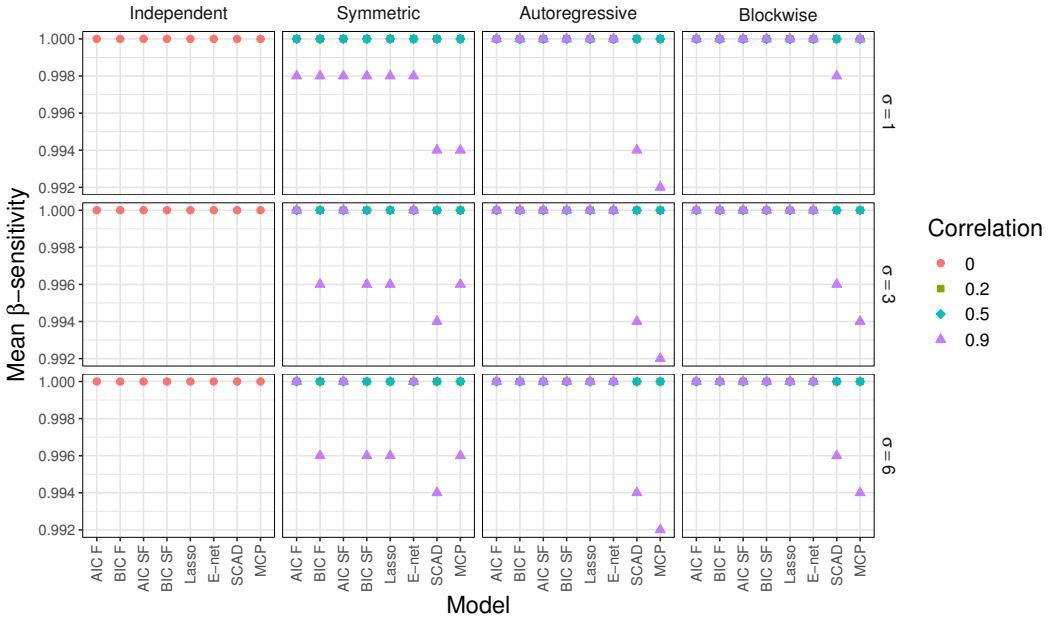


Figure 26: Average $\beta$-sensitivity for the linear simulations when $n = 1000$ and $p = 100$. See Table 26 for the corresponding data.

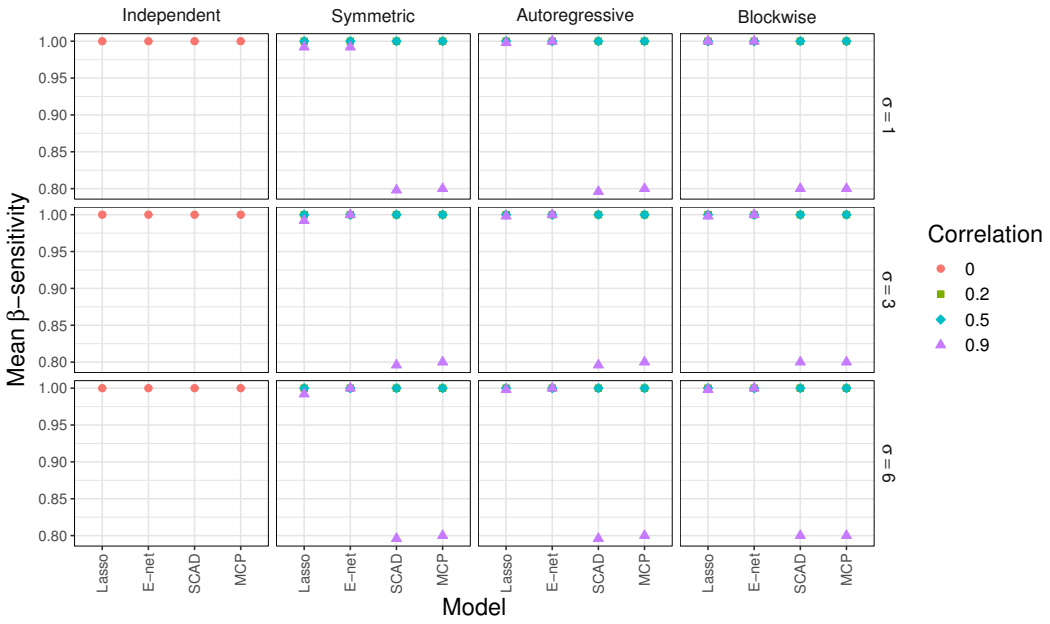


Figure 27: Average $\beta$-sensitivity for the linear simulations when $n = 1000$ and $p = 2000$. See Table 27 for the corresponding data.

## 2.4 Figures for the average $\beta$-specificity of the linear simulations

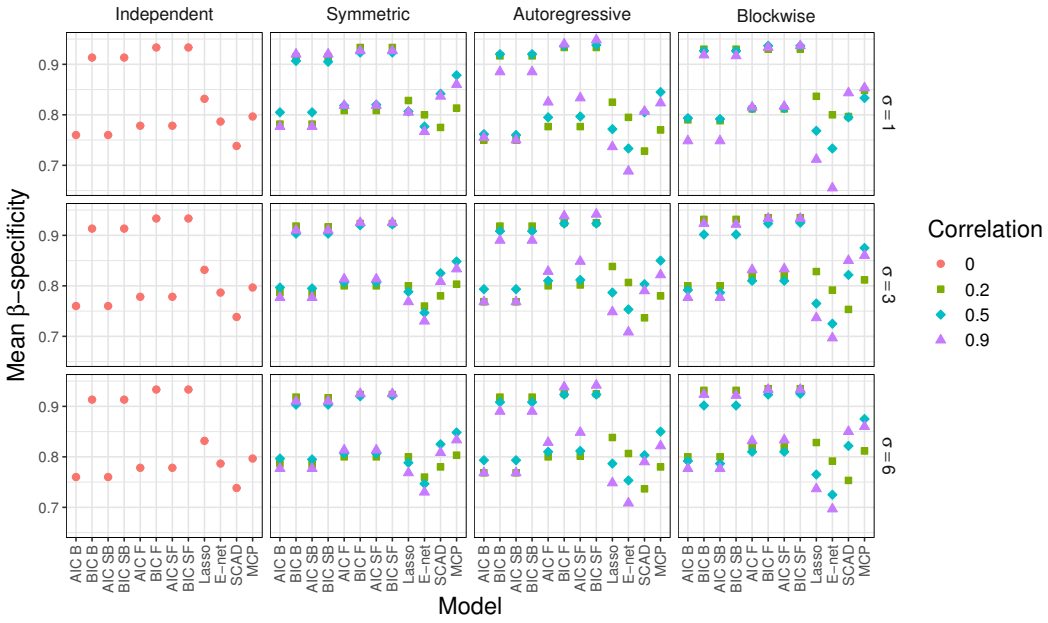


Figure 28: Average $\beta$-specificity for the linear simulations when $n = 50$ and $p = 10$. See Table 28 for the corresponding data.

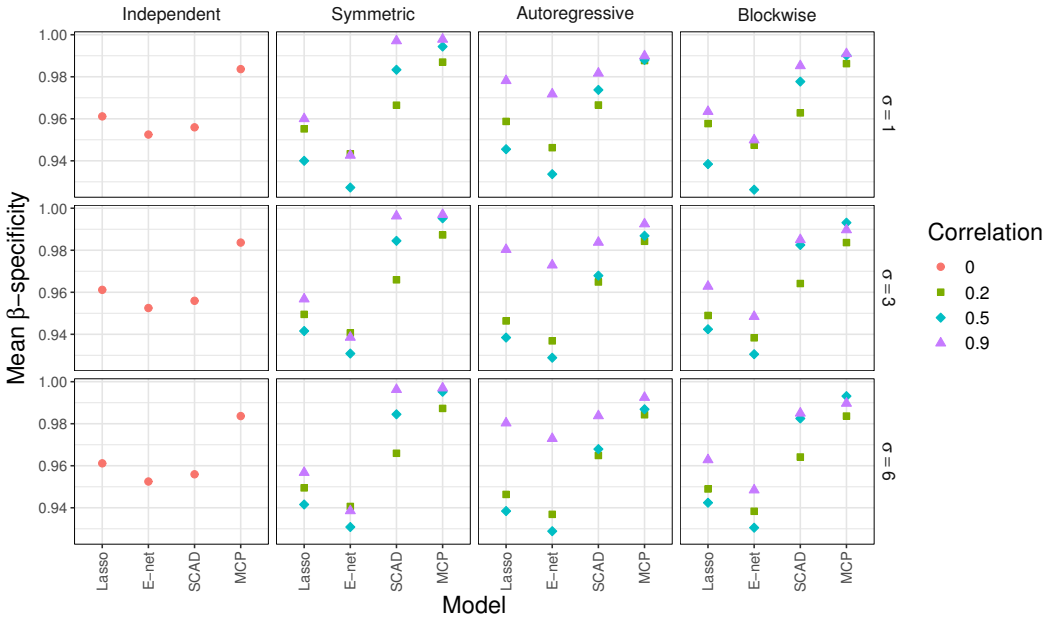


Figure 29: Average $\beta$-specificity for the linear simulations when $n = 50$ and $p = 100$. See Table 29 for the corresponding data.

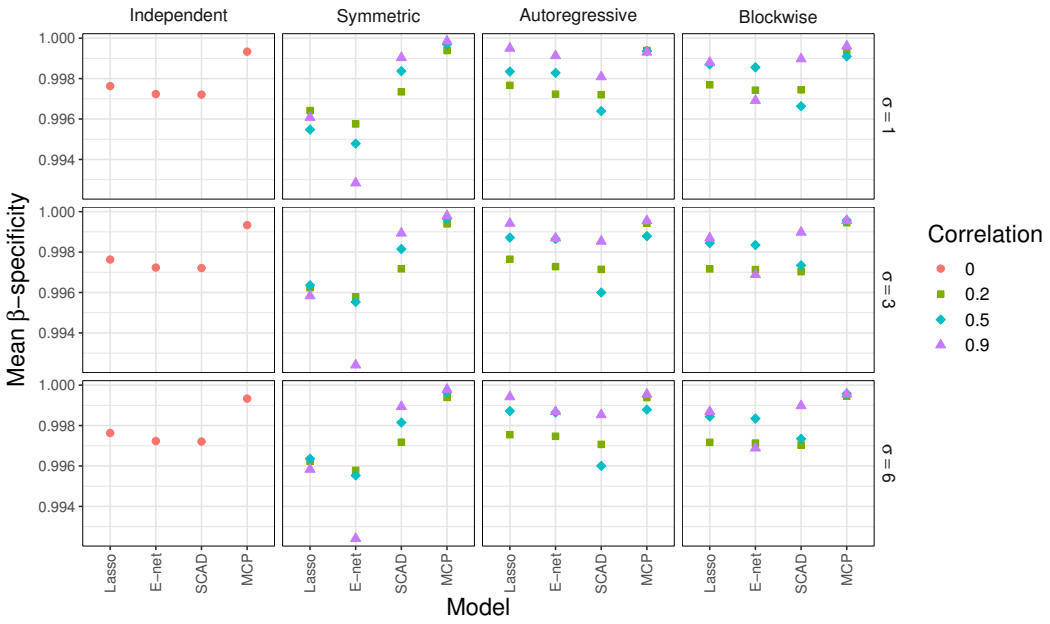


Figure 30: Average $\beta$-specificity for the linear simulations when $n = 50$ and $p = 2000$. See Table 30 for the corresponding data.

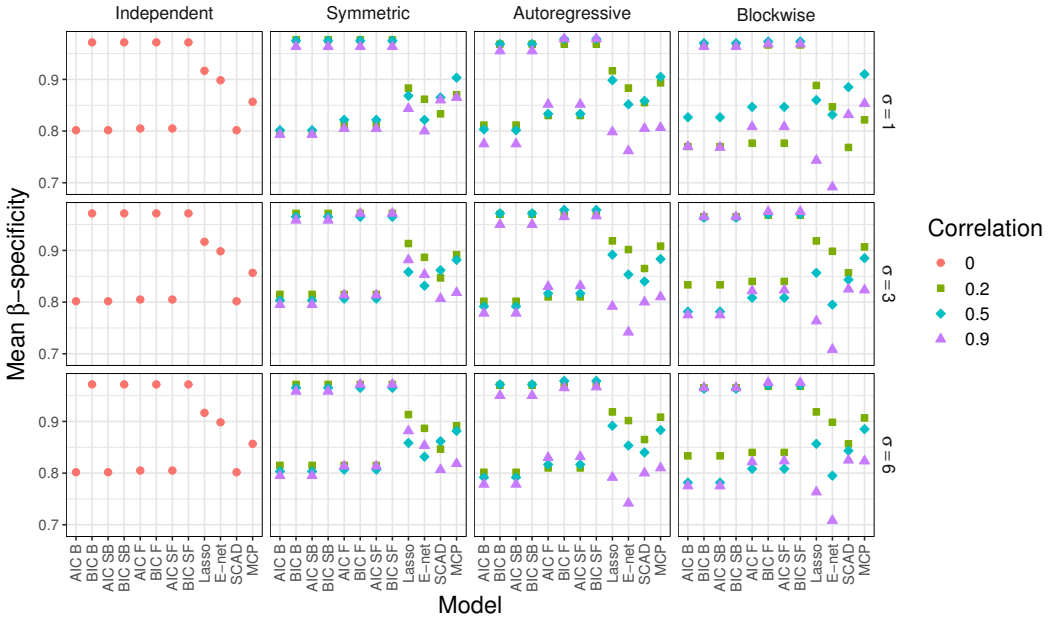


Figure 31: Average $\beta$-specificity for the linear simulations when $n = 200$ and $p = 10$. See Table 31 for the corresponding data.

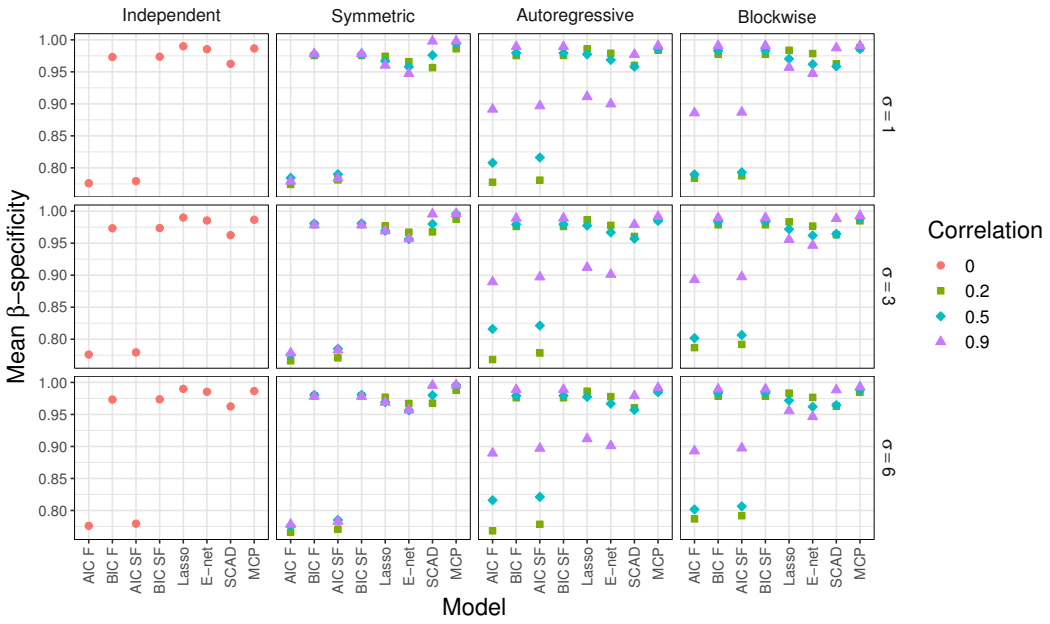


Figure 32: Average $\beta$-specificity for the linear simulations when $n = 200$ and $p = 100$. See Table 32 for the corresponding data.

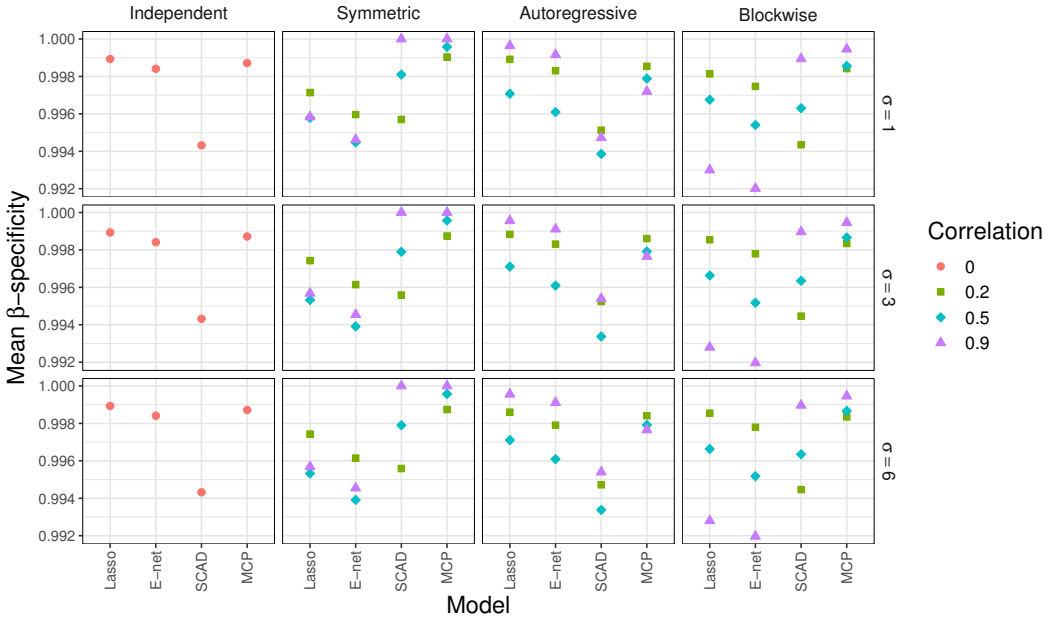


Figure 33: Average $\beta$-specificity for the linear simulations when $n = 200$ and $p = 2000$. See Table 33 for the corresponding data.

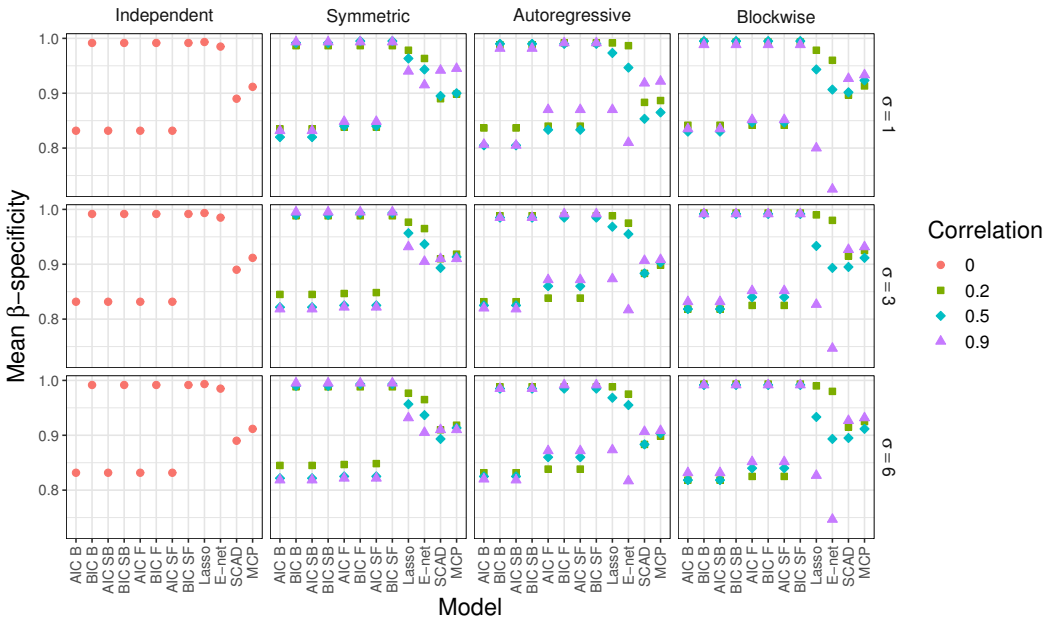


Figure 34: Average $\beta$-specificity for the linear simulations when $n = 1000$ and $p = 10$. See Table 34 for the corresponding data.

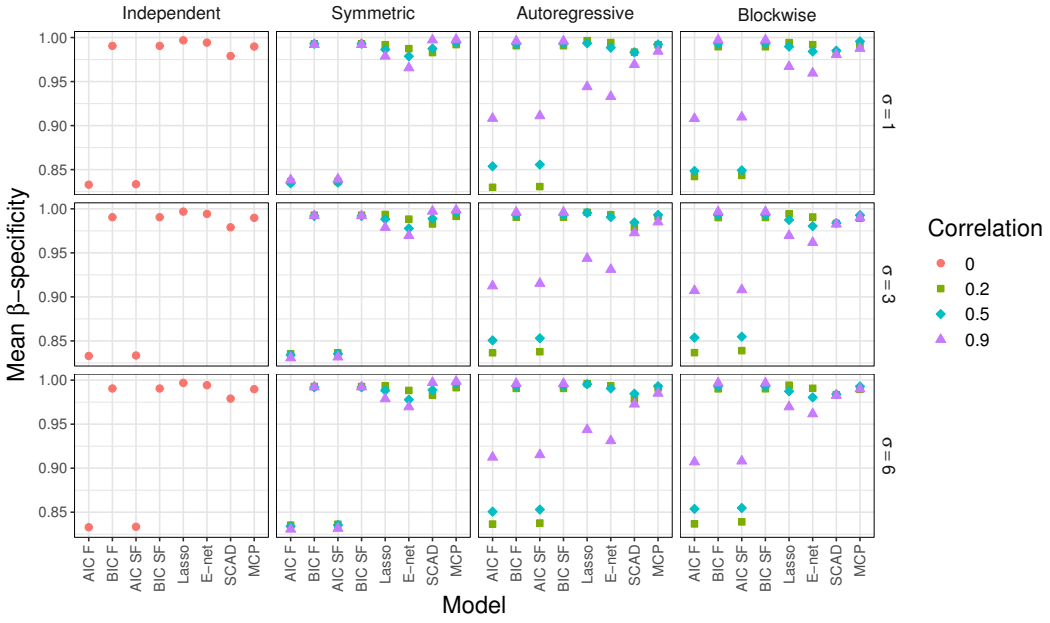


Figure 35: Average $\beta$-specificity for the linear simulations when $n = 1000$ and $p = 100$. See Table 35 for the corresponding data.

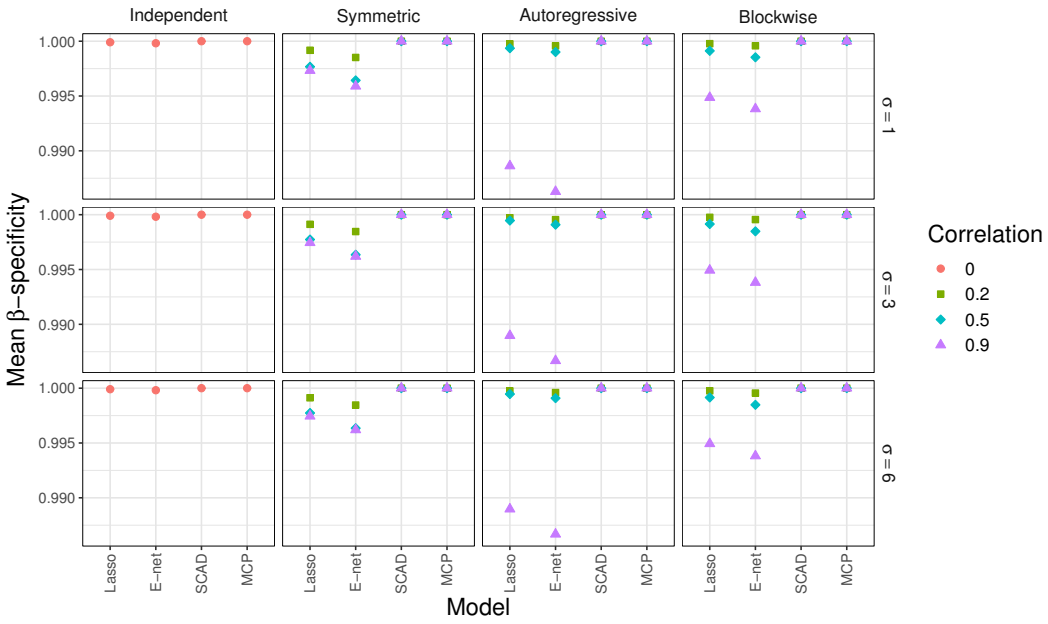


Figure 36: Average $\beta$-specificity for the linear simulations when $n = 1000$ and $p = 2000$. See Table 36 for the corresponding data.

# 3 Figures from the non-linear simulations

## 3.1 Figures for the average training MSE of the non-linear simulations

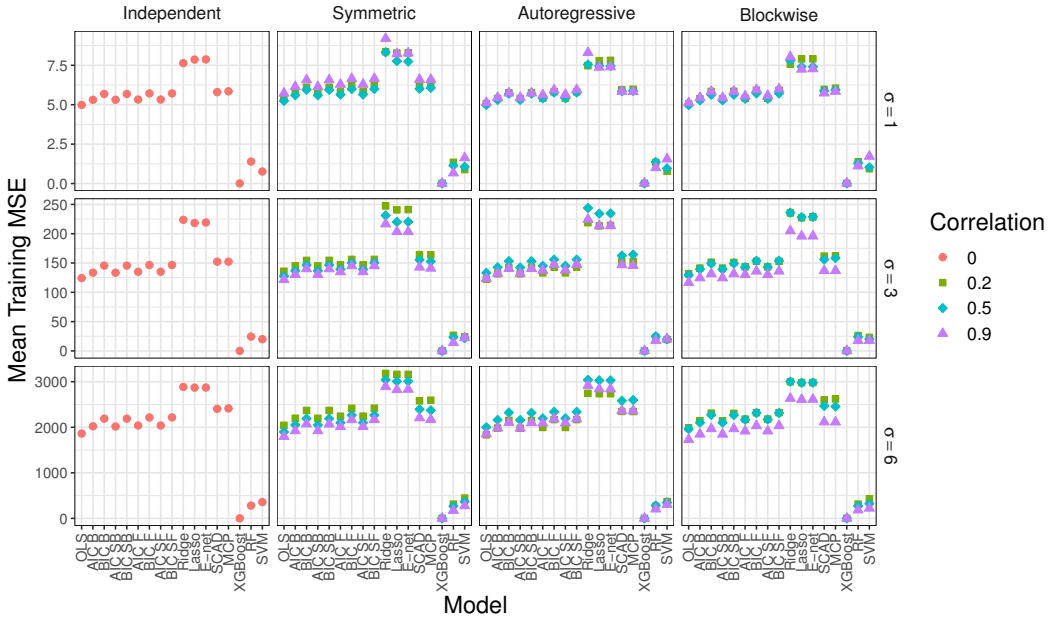


Figure 37: Average training MSE for the non-linear simulations when $n = 50$ and $p = 10$. See Table 37 for the corresponding data.

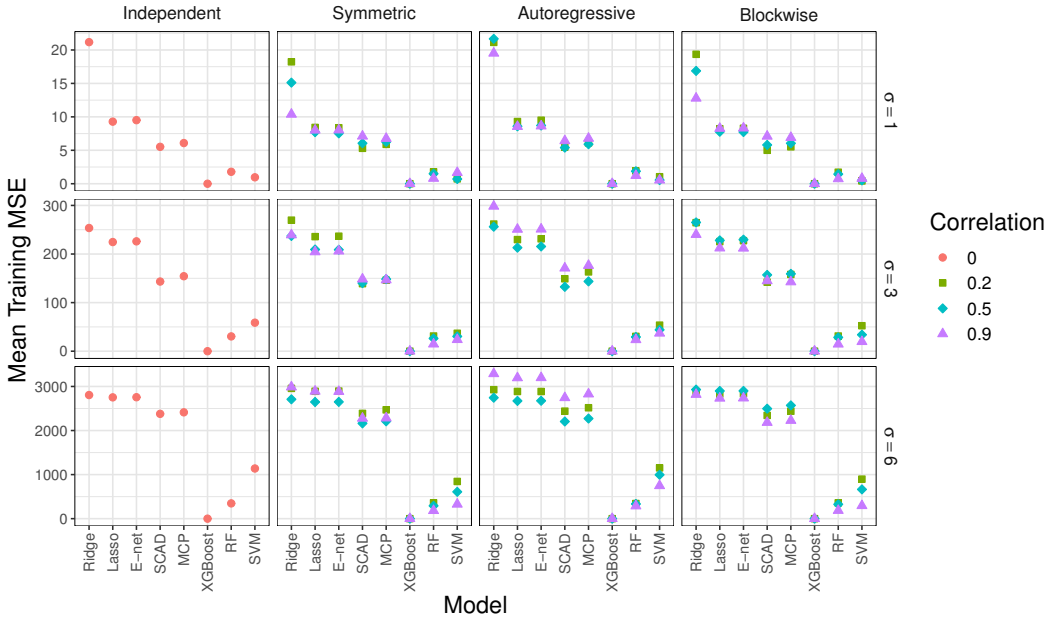


Figure 38: Average training MSE for the non-linear simulations when $n = 50$ and $p = 100$. See Table 38 for the corresponding data.

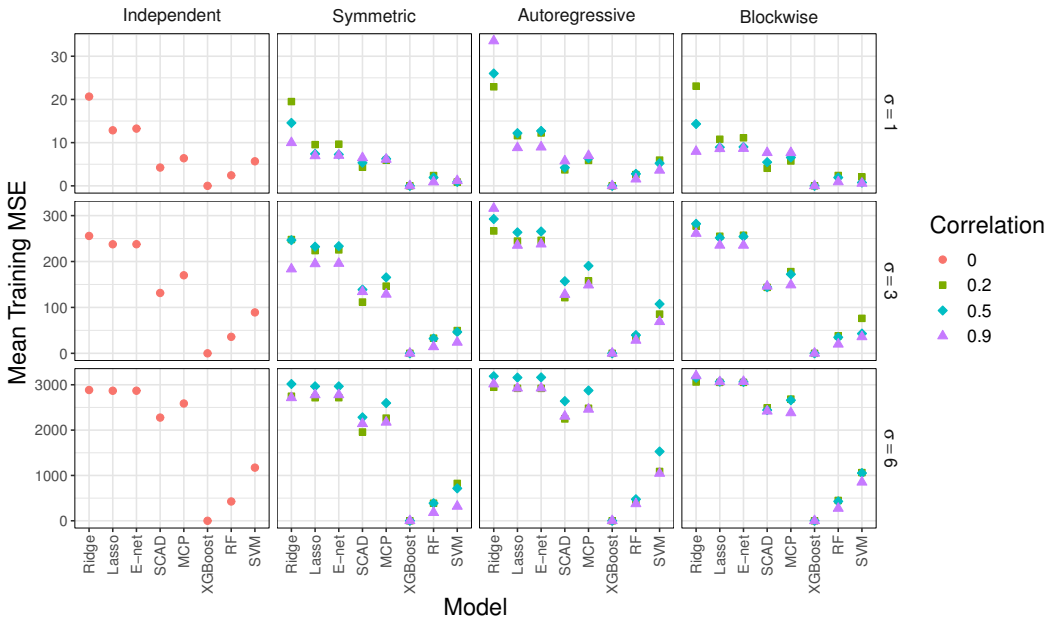


Figure 39: Average training MSE for the non-linear simulations when $n = 50$ and $p = 2000$. See Table 39 for the corresponding data.

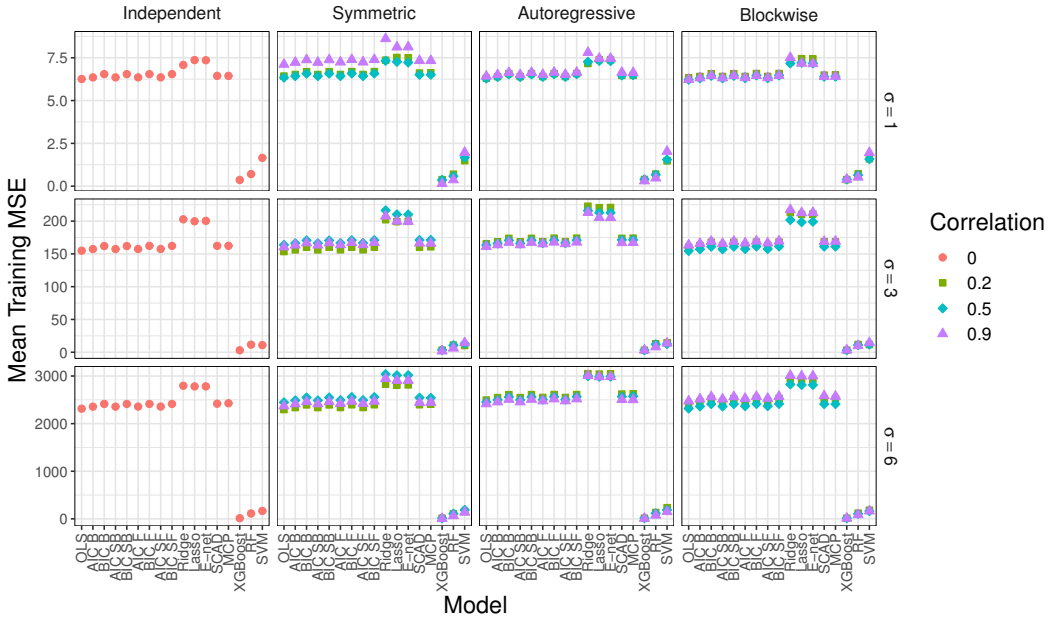


Figure 40: Average training MSE for the non-linear simulations when $n = 200$ and $p = 10$. See Table 40 for the corresponding data.

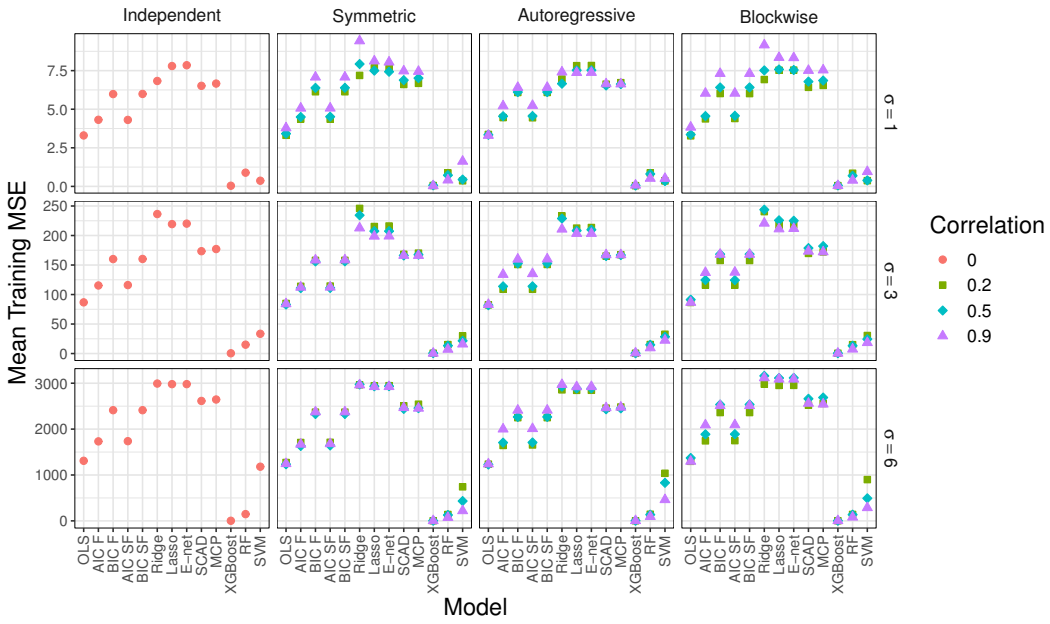


Figure 41: Average training MSE for the non-linear simulations when $n = 200$ and $p = 100$. See Table 41 for the corresponding data.

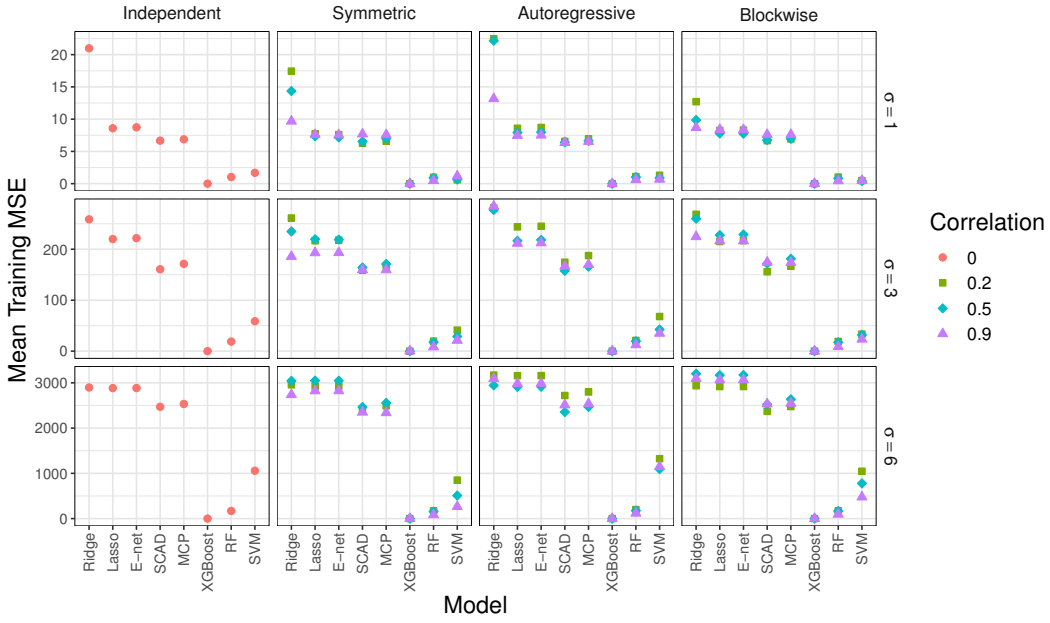


Figure 42: Average training MSE for the non-linear simulations when $n = 200$ and $p = 2000$. See Table 42 for the corresponding data.

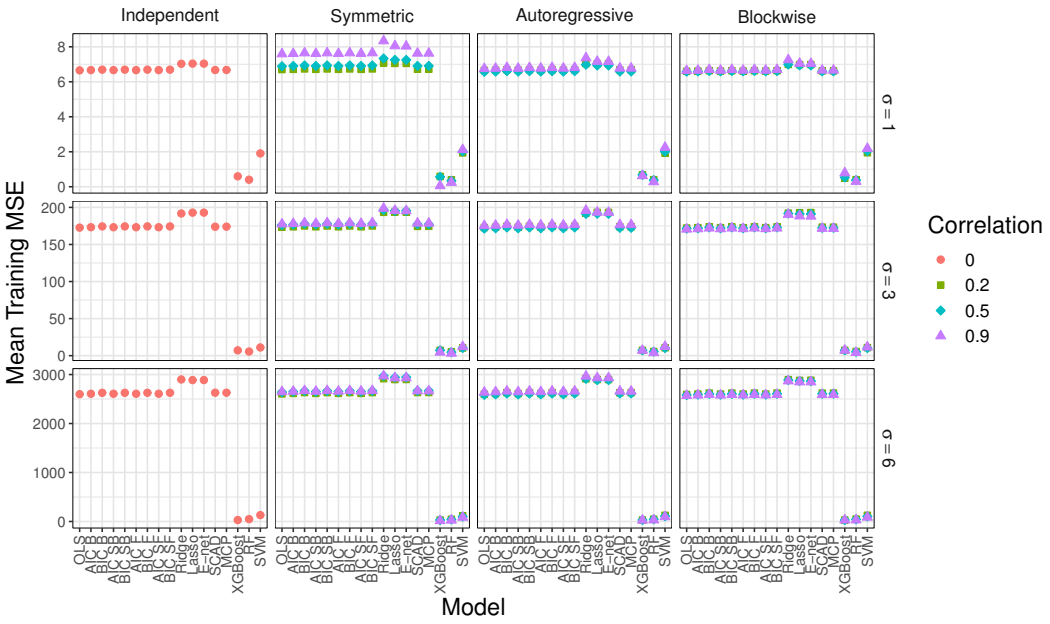


Figure 43: Average training MSE for the non-linear simulations when $n = 1000$ and $p = 10$. See Table 43 for the corresponding data.

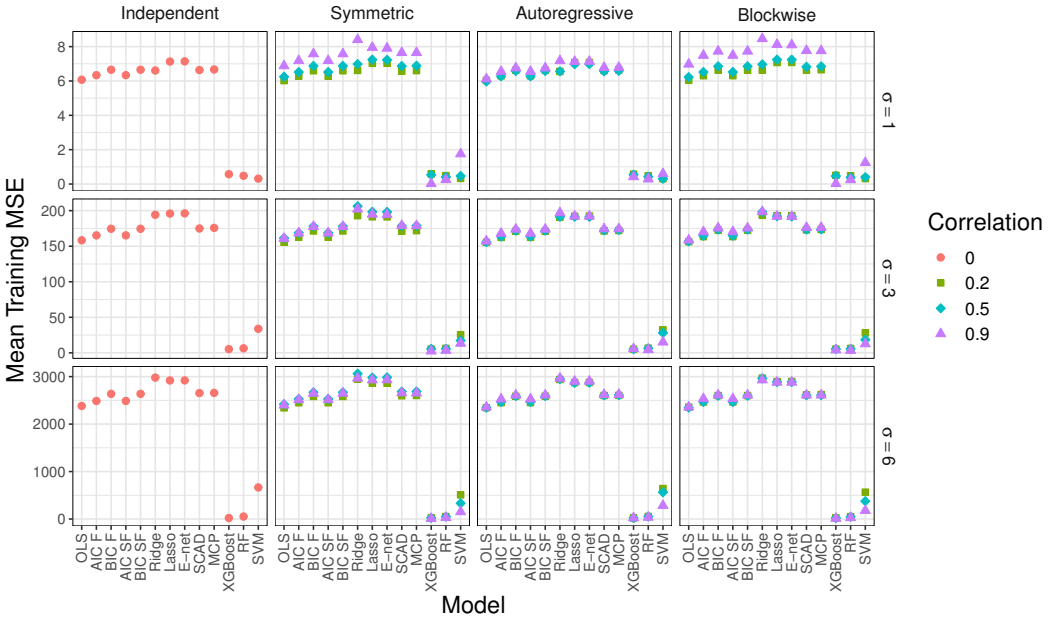


Figure 44: Average training MSE for the non-linear simulations when $n = 1000$ and $p = 100$. See Table 44 for the corresponding data.

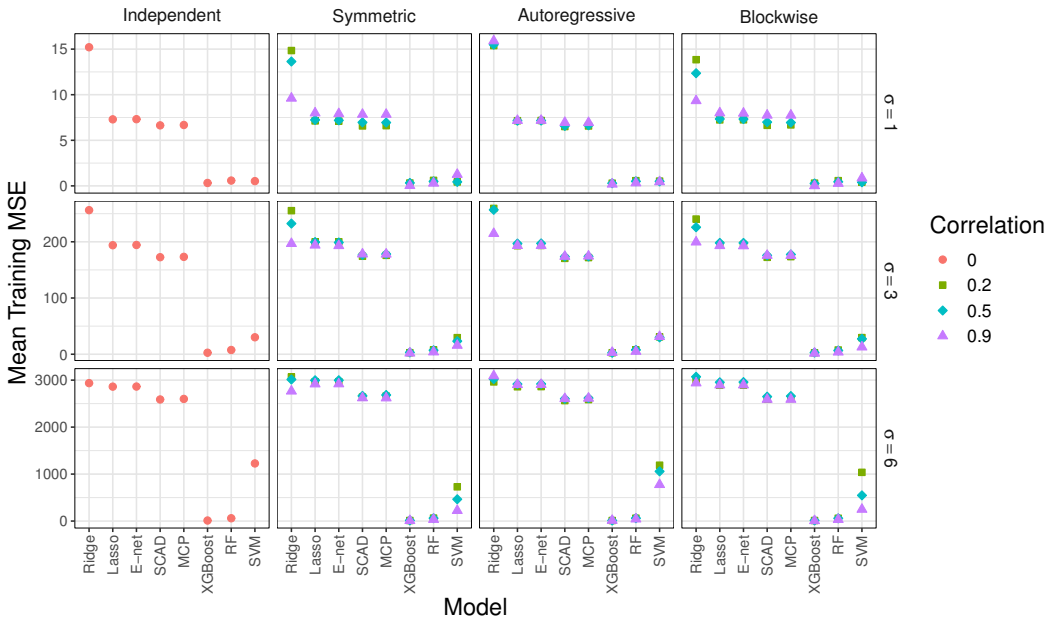


Figure 45: Average training MSE for the non-linear simulations when $n = 1000$ and $p = 2000$. See Table 45 for the corresponding data.

## 3.2 Figures for the average testing MSE of the non-linear simulations

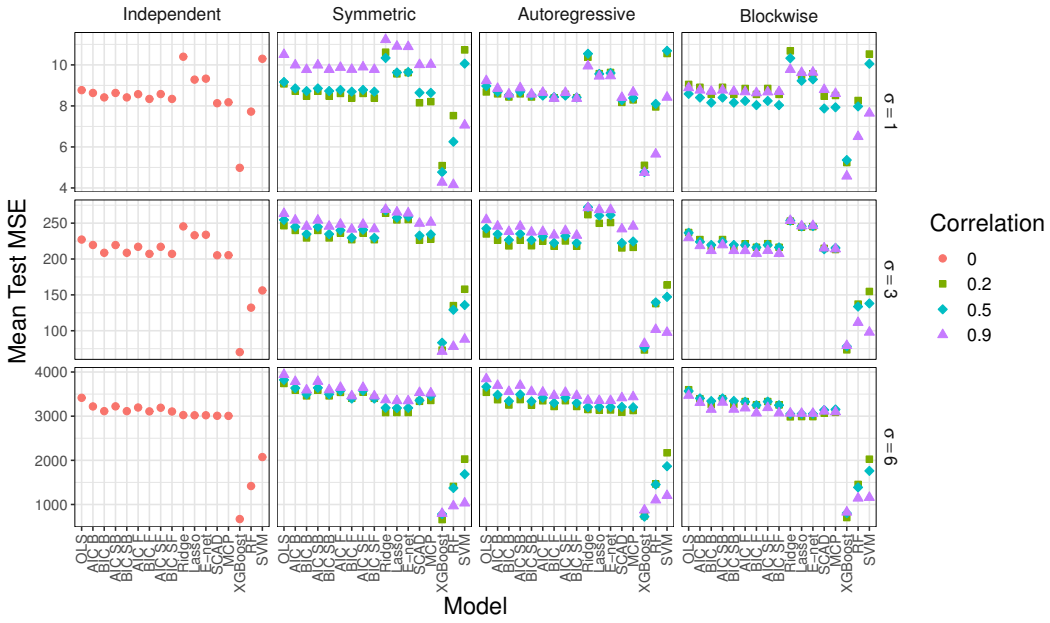


Figure 46: Average testing MSE for the non-linear simulations when $n = 50$ and $p = 10$. See Table 46 for the corresponding data.

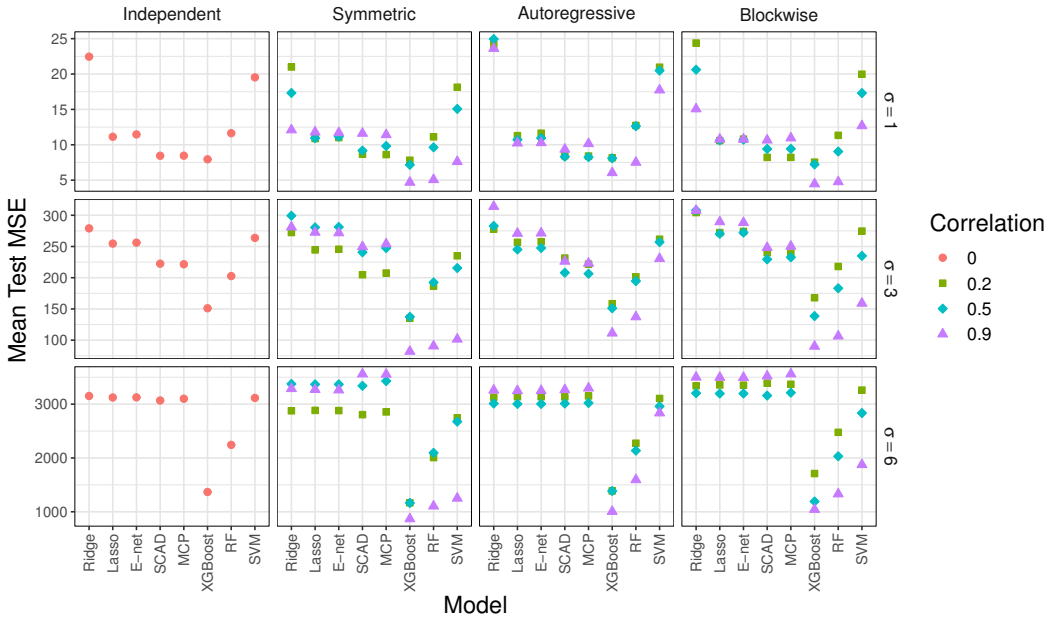


Figure 47: Average testing MSE for the non-linear simulations when $n = 50$ and $p = 100$. See Table 47 for the corresponding data.

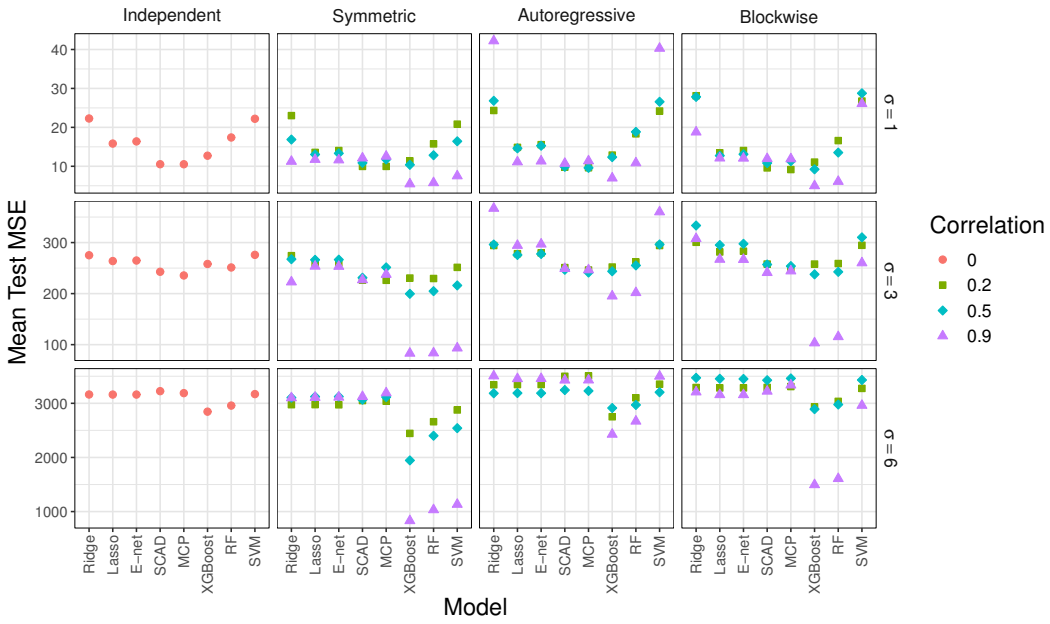


Figure 48: Average testing MSE for the non-linear simulations when $n = 50$ and $p = 2000$. See Table 48 for the corresponding data.

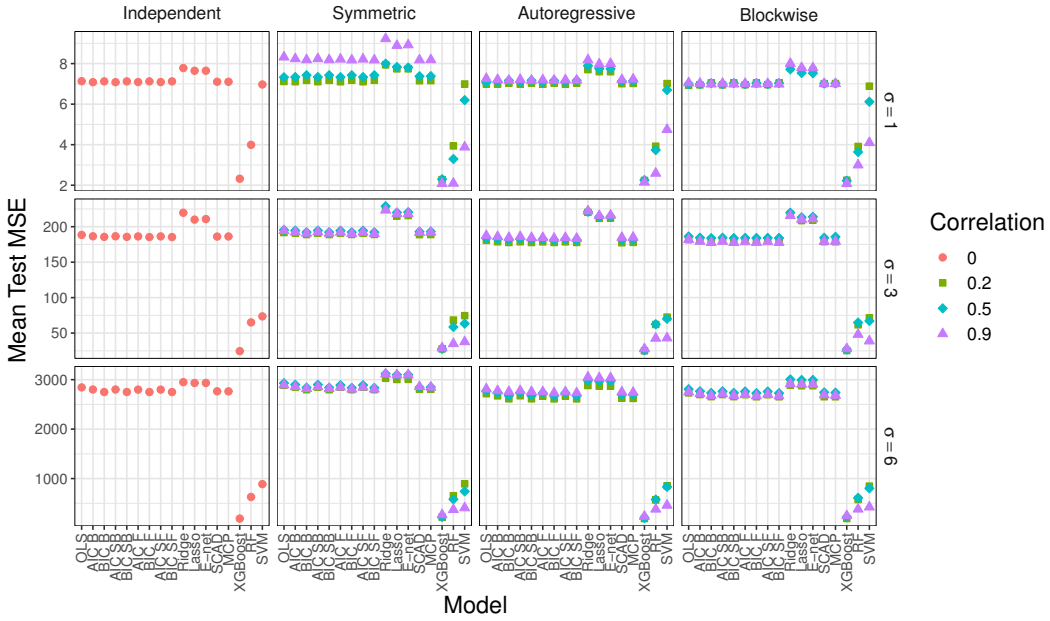


Figure 49: Average testing MSE for the non-linear simulations when $n = 200$ and $p = 10$. See Table 49 for the corresponding data.

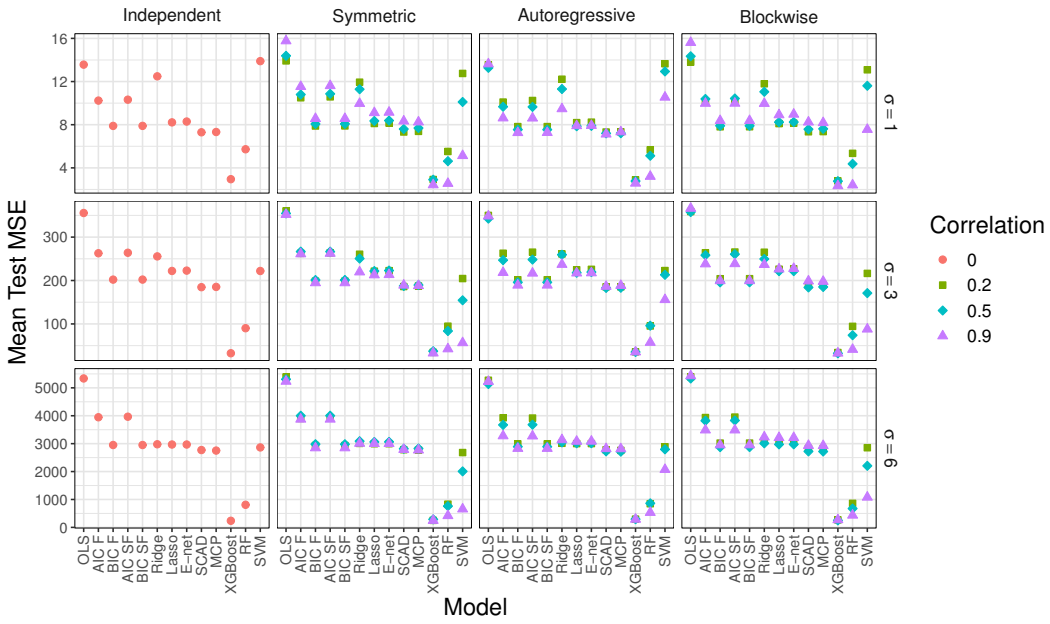


Figure 50: Average testing MSE for the non-linear simulations when $n = 200$ and $p = 100$. See Table 50 for the corresponding data.

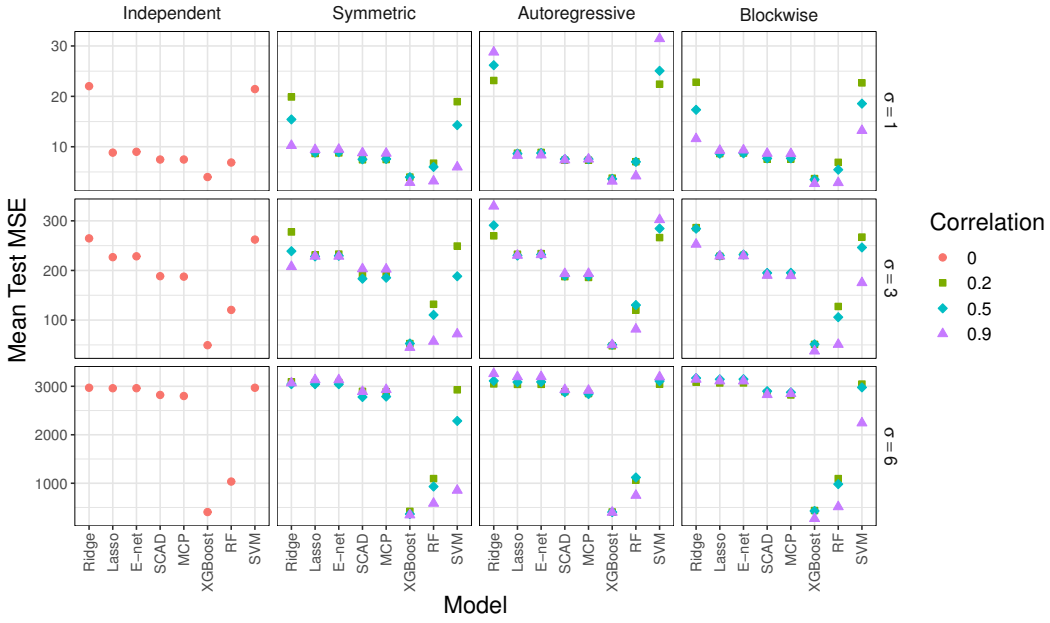


Figure 51: Average testing MSE for the non-linear simulations when $n = 200$ and $p = 2000$. See Table 51 for the corresponding data.

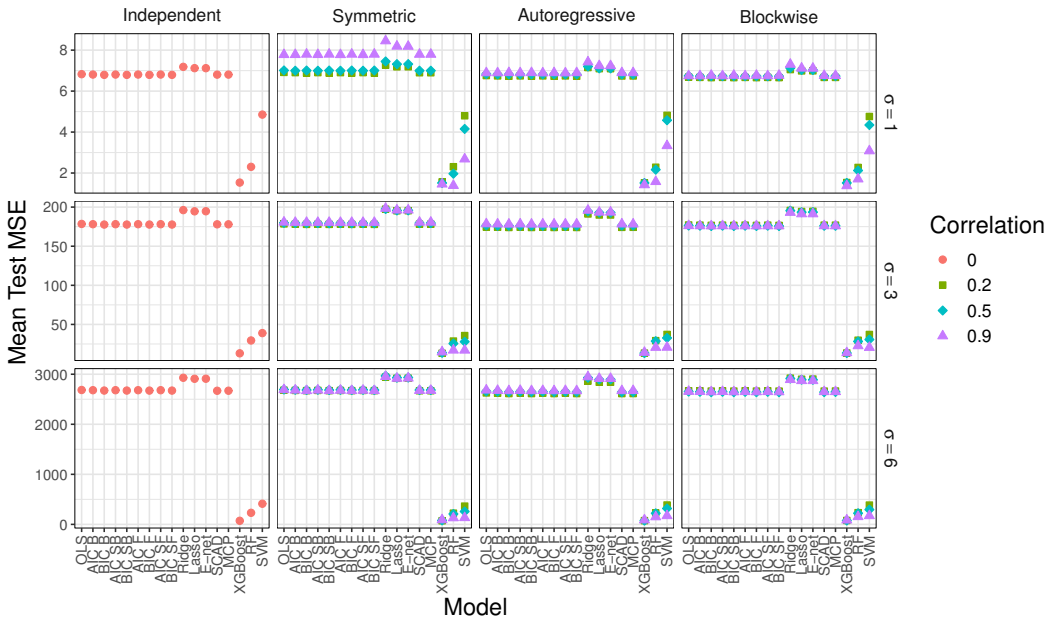


Figure 52: Average testing MSE for the non-linear simulations when $n = 1000$ and $p = 10$. See Table 52 for the corresponding data.

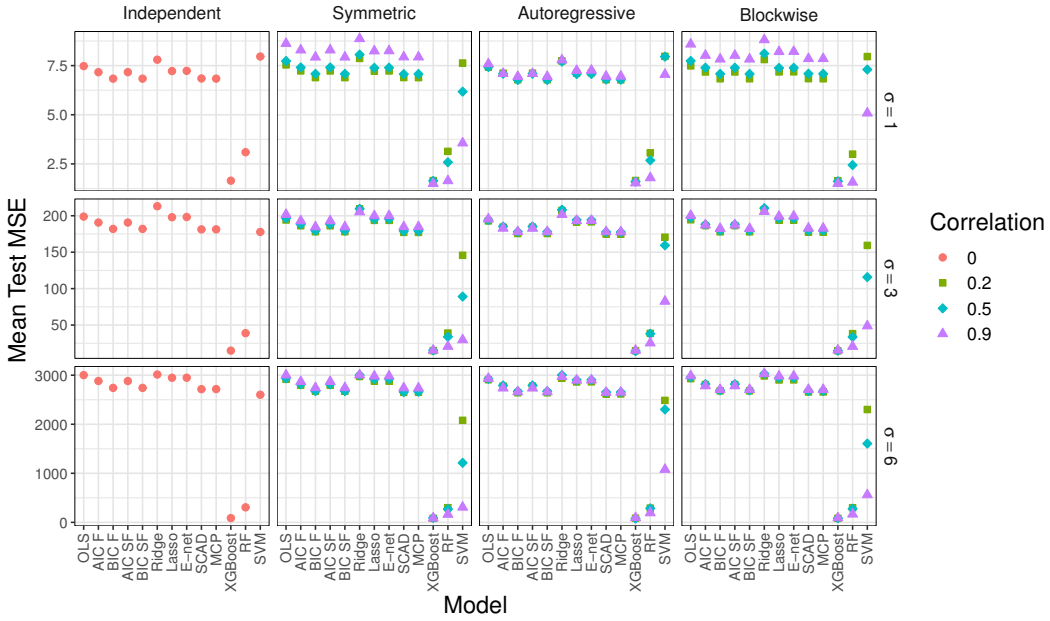


Figure 53: Average testing MSE for the non-linear simulations when $n = 1000$ and $p = 100$. See Table 53 for the corresponding data.

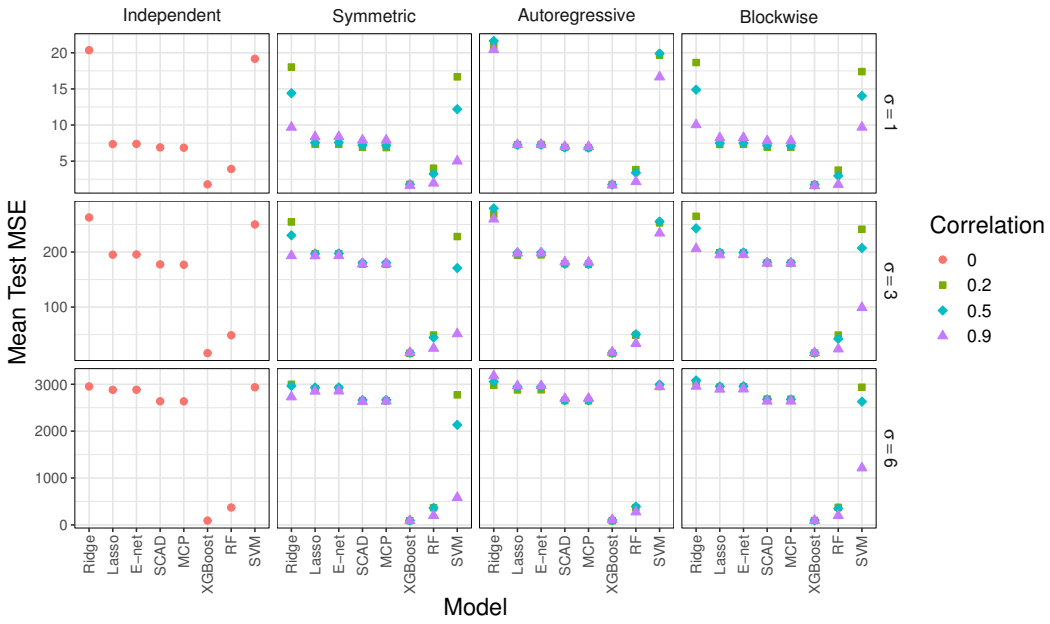


Figure 54: Average testing MSE for the non-linear simulations when $n = 1000$ and $p = 2000$. See Table 54 for the corresponding data.

## 3.3 Figures for the average $\beta$-sensitivity of the non-linear simulations

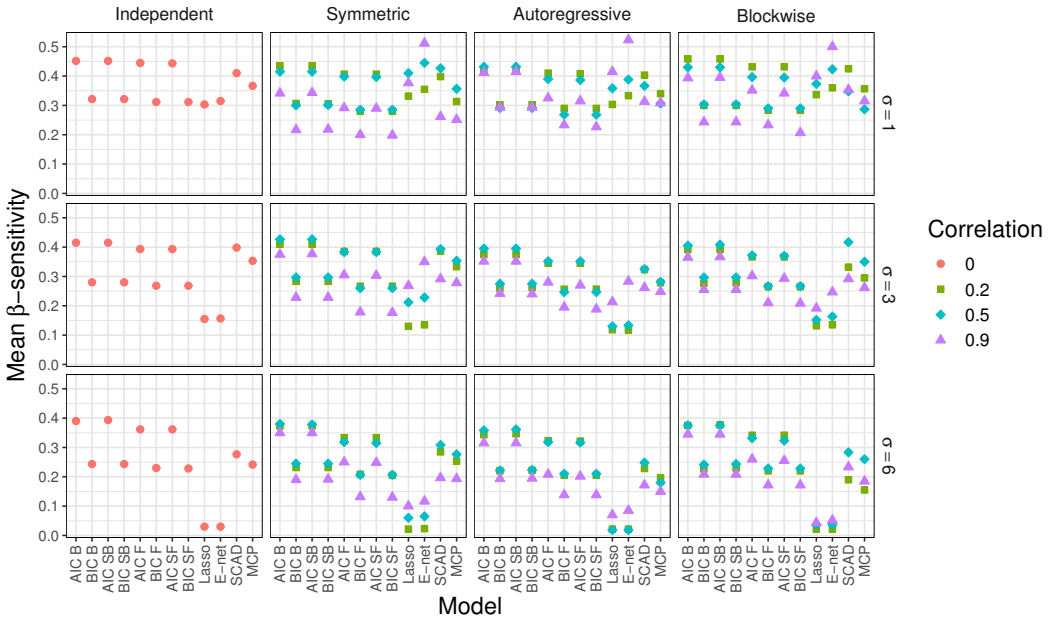


Figure 55: Average $\beta$-sensitivity for the non-linear simulations when $n = 50$ and $p = 10$. See Table 55 for the corresponding data.

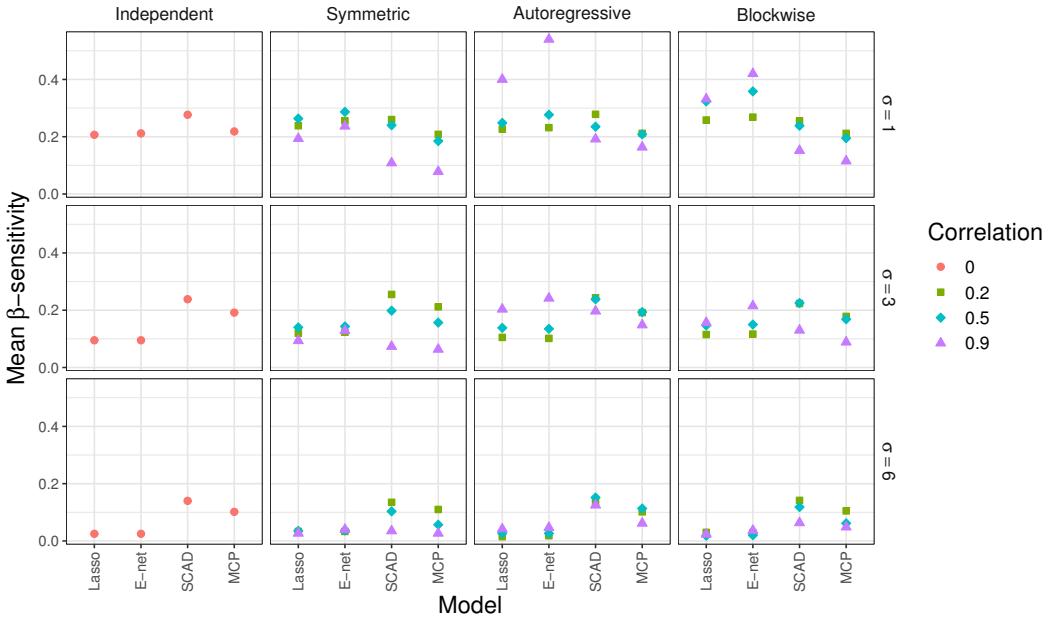


Figure 56: Average $\beta$-sensitivity for the non-linear simulations when $n = 50$ and $p = 100$. See Table 56 for the corresponding data.

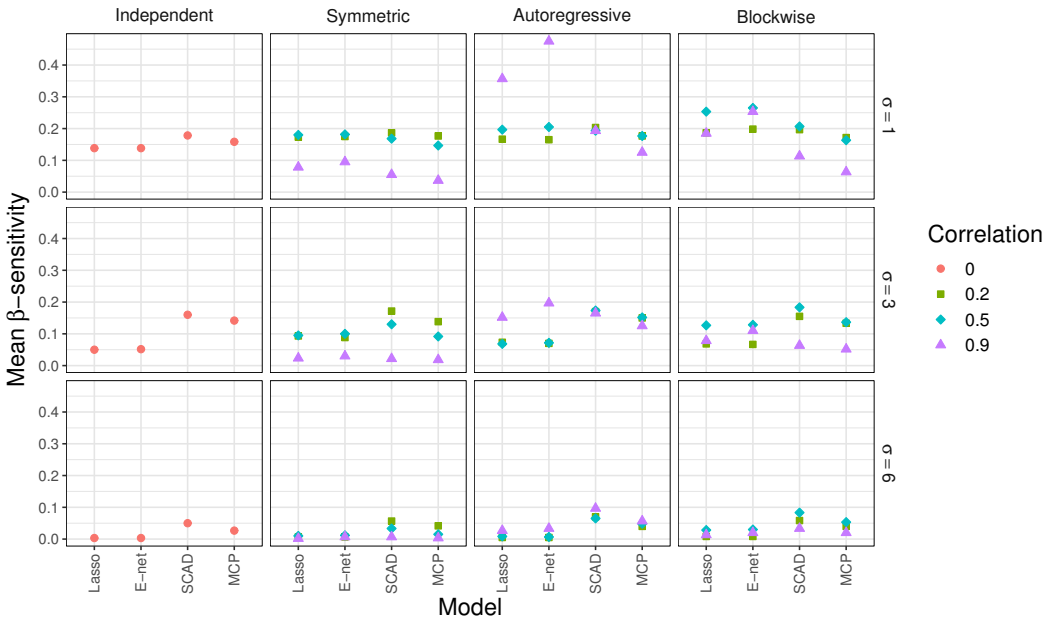


Figure 57: Average $\beta$-sensitivity for the non-linear simulations when $n = 50$ and $p = 2000$. See Table 57 for the corresponding data.

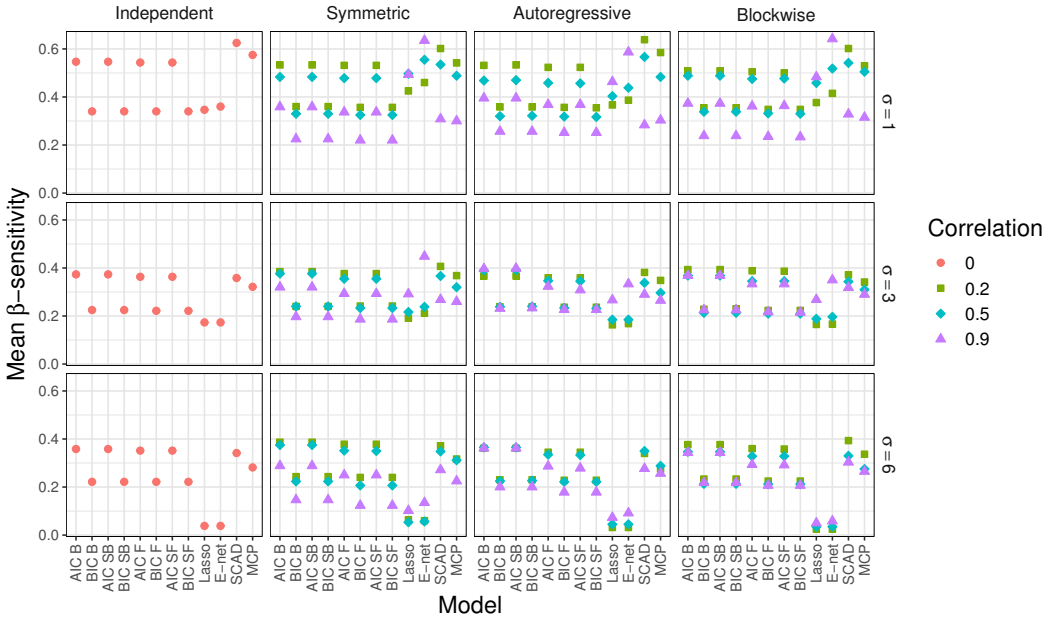


Figure 58: Average $\beta$-sensitivity for the non-linear simulations when $n = 200$ and $p = 10$. See Table 58 for the corresponding data.

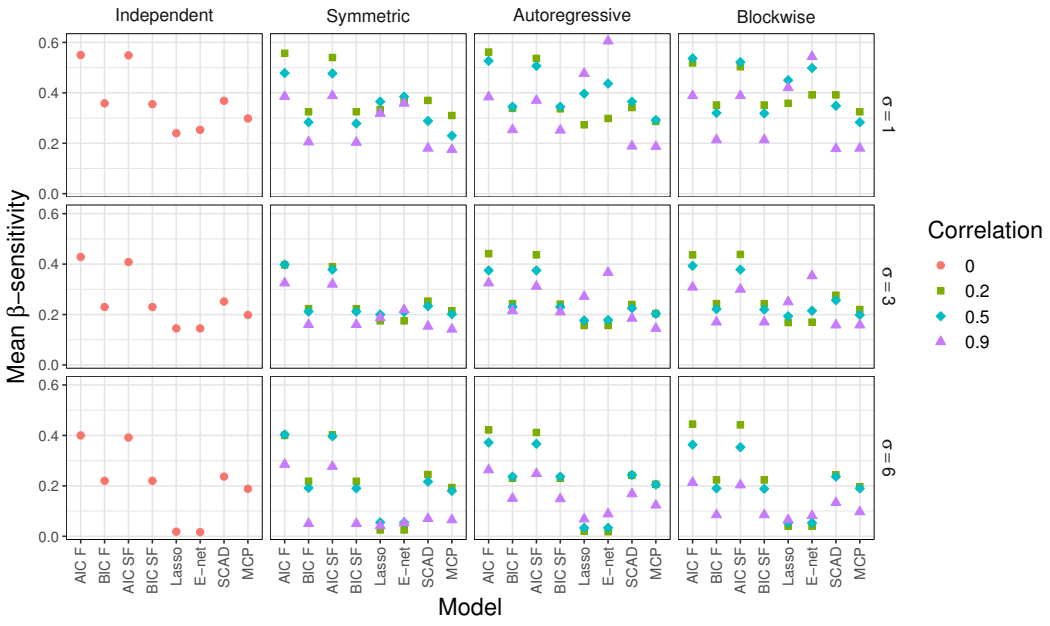


Figure 59: Average $\beta$-sensitivity for the non-linear simulations when $n = 200$ and $p = 100$. See Table 59 for the corresponding data.

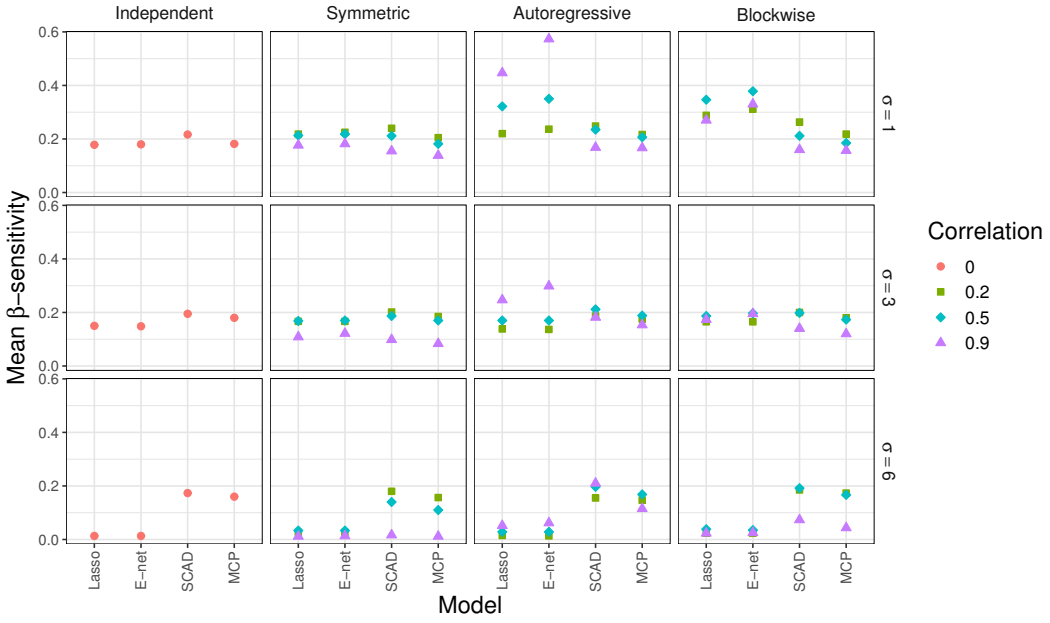


Figure 60: Average $\beta$-sensitivity for the non-linear simulations when $n = 200$ and $p = 2000$. See Table 60 for the corresponding data.

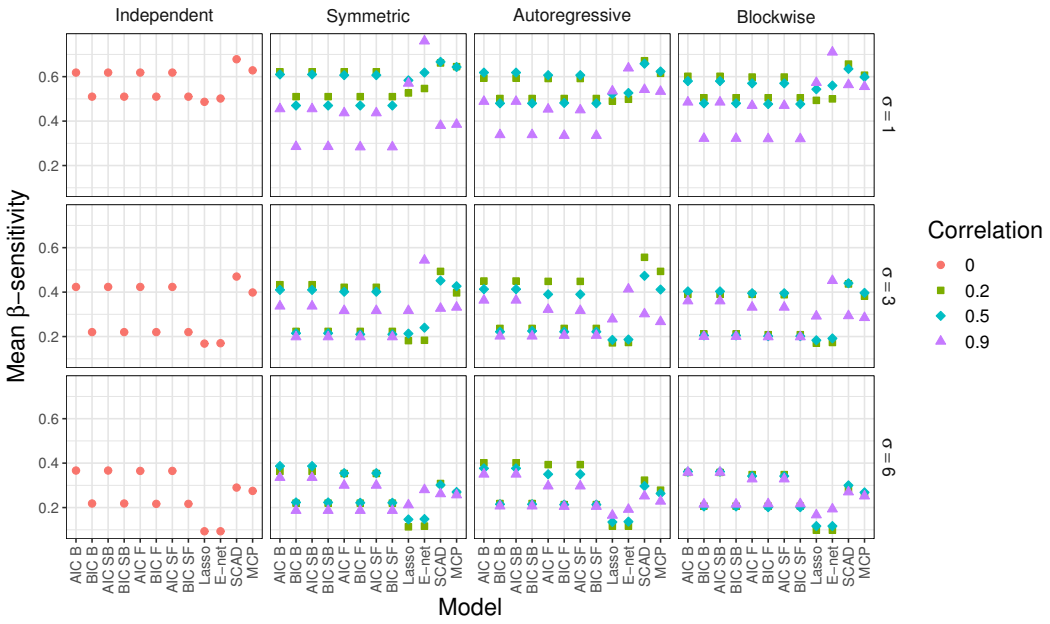


Figure 61: Average $\beta$-sensitivity for the non-linear simulations when $n = 1000$ and $p = 10$. See Table 61 for the corresponding data.

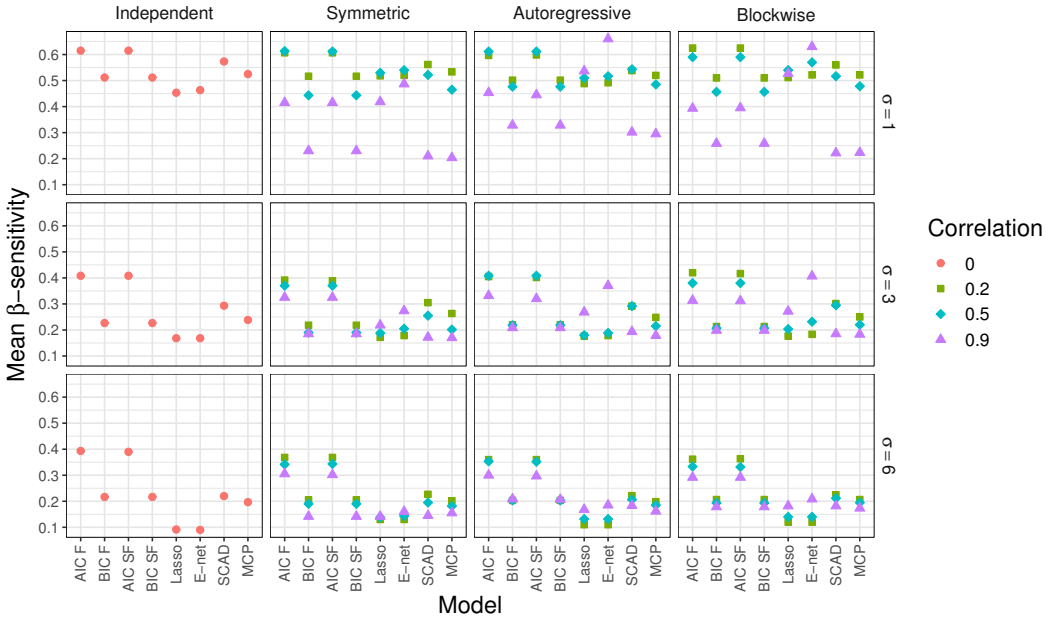


Figure 62: Average $\beta$-sensitivity for the non-linear simulations when $n = 1000$ and $p = 100$. See Table 62 for the corresponding data.

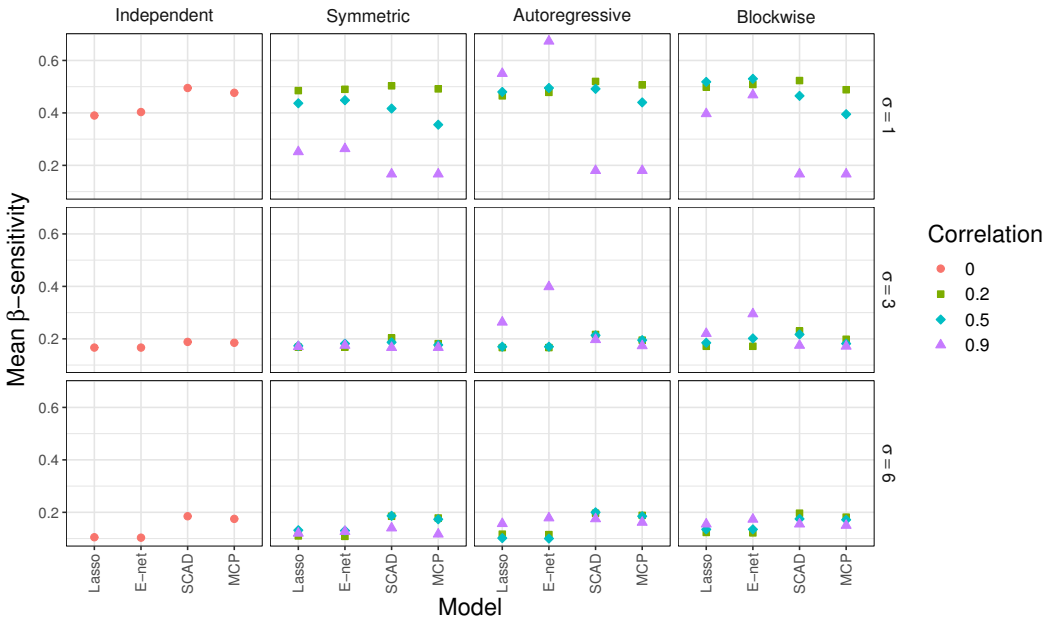


Figure 63: Average $\beta$-sensitivity for the non-linear simulations when $n = 1000$ and $p = 2000$. See Table 63 for the corresponding data.

## 3.4 Figures for the average $\beta$-specificity of the non-linear simulations

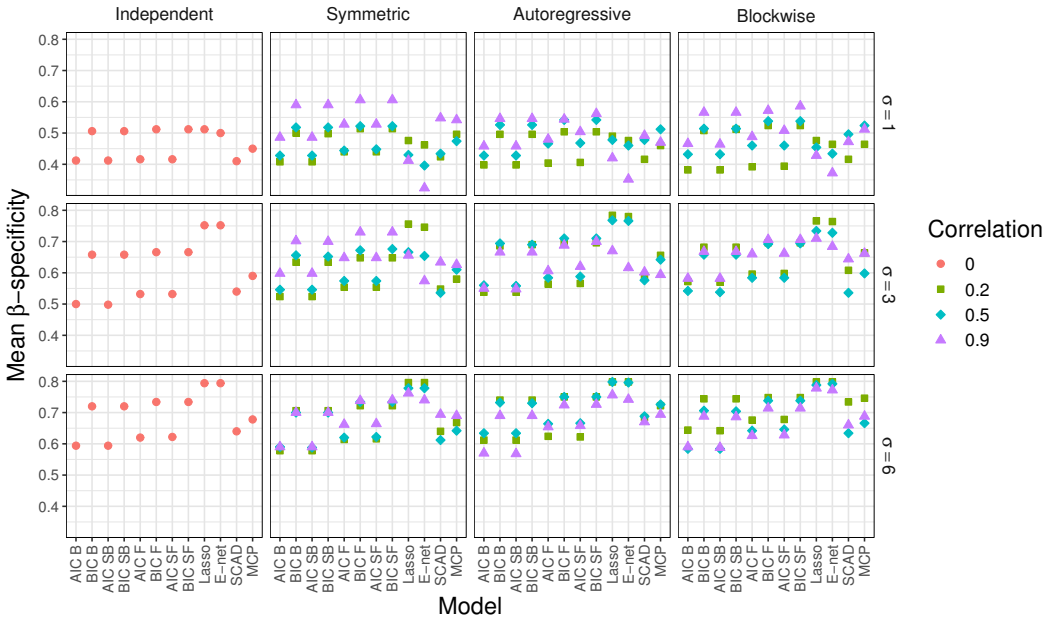


Figure 64: Average $\beta$-specificity for the non-linear simulations when $n = 50$ and $p = 10$. See Table 64 for the corresponding data.

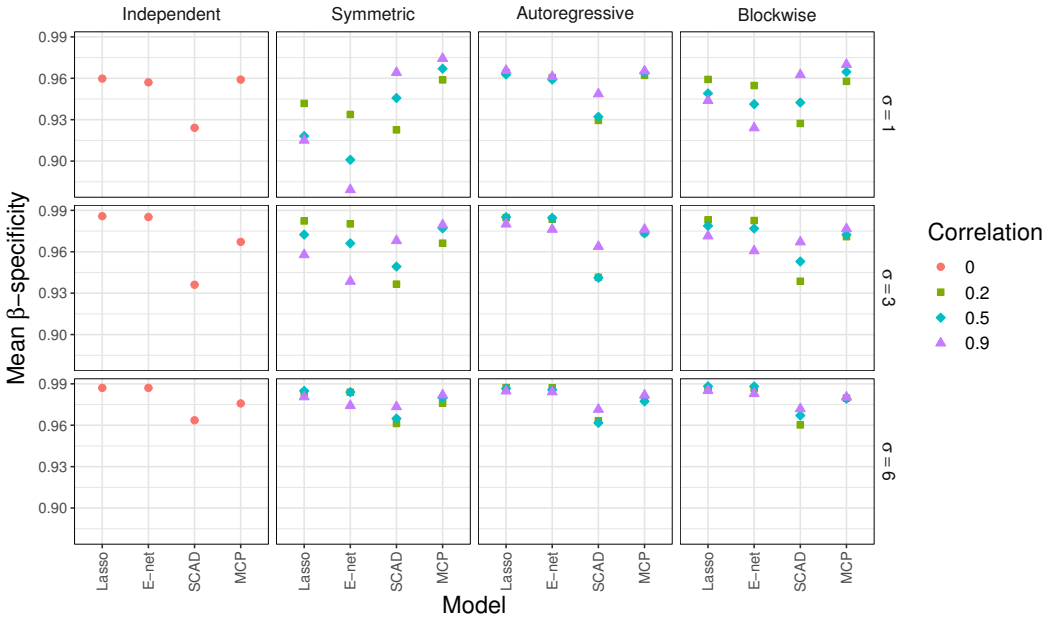


Figure 65: Average $\beta$-specificity for the non-linear simulations when $n = 50$ and $p = 100$. See Table 65 for the corresponding data.

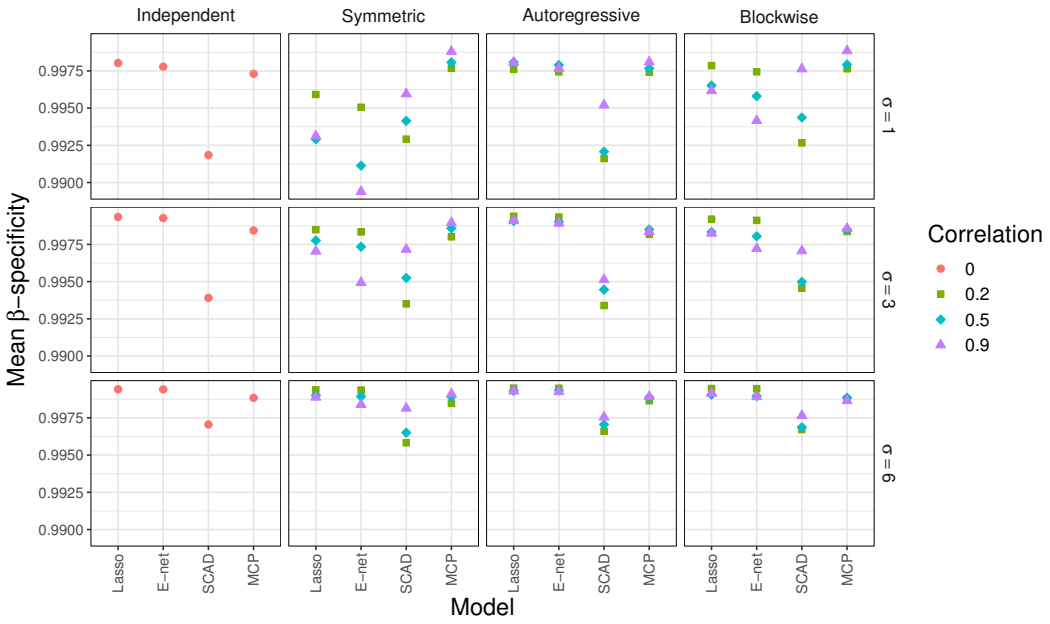


Figure 66: Average $\beta$-specificity for the non-linear simulations when $n = 50$ and $p = 2000$. See Table 66 for the corresponding data.

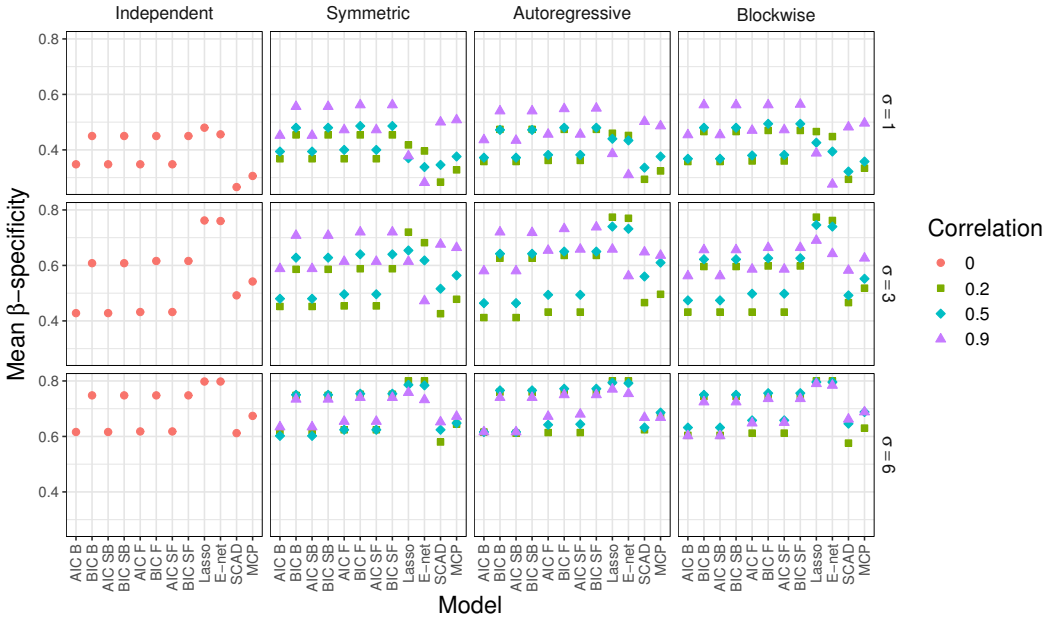


Figure 67: Average $\beta$-specificity for the non-linear simulations when $n = 200$ and $p = 10$. See Table 67 for the corresponding data.

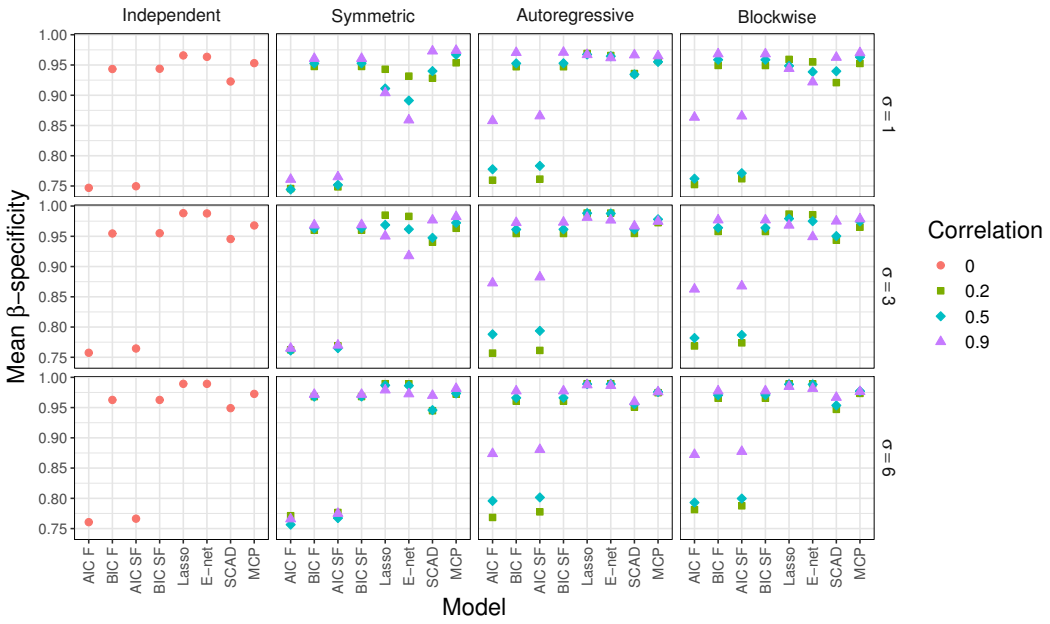


Figure 68: Average $\beta$-specificity for the non-linear simulations when $n = 200$ and $p = 100$. See Table 68 for the corresponding data.

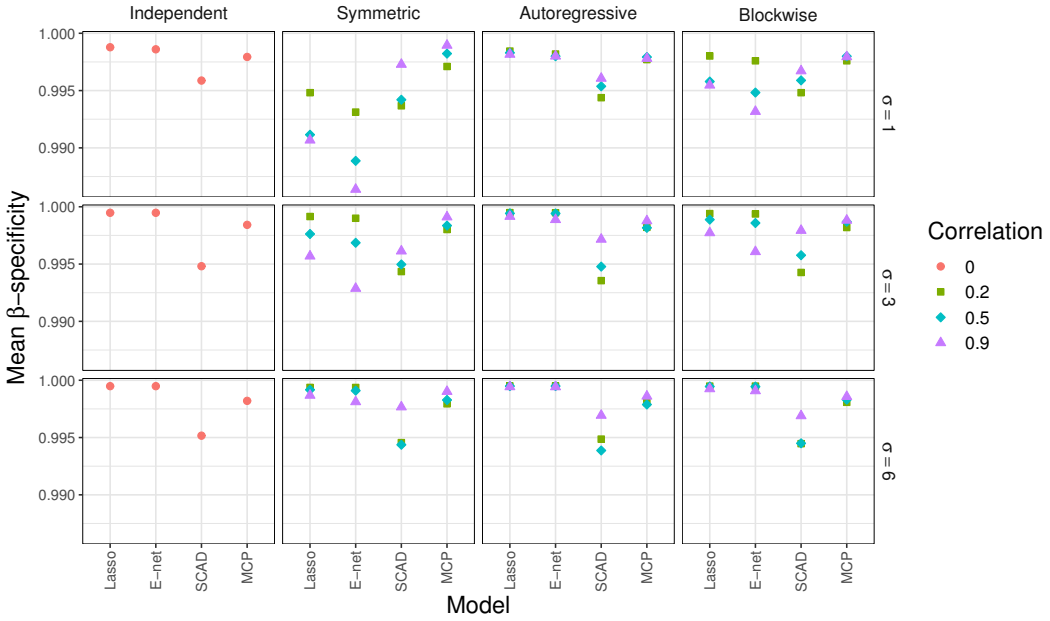


Figure 69: Average $\beta$-specificity for the non-linear simulations when $n = 200$ and $p = 2000$. See Table 69 for the corresponding data.

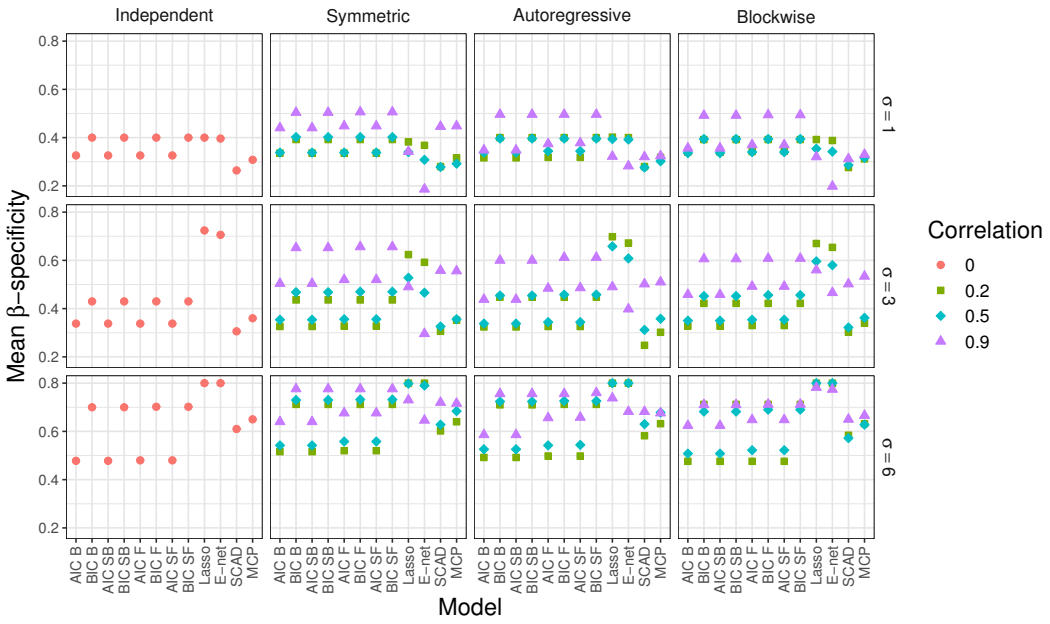


Figure 70: Average $\beta$-specificity for the non-linear simulations when $n = 1000$ and $p = 10$. See Table 70 for the corresponding data.

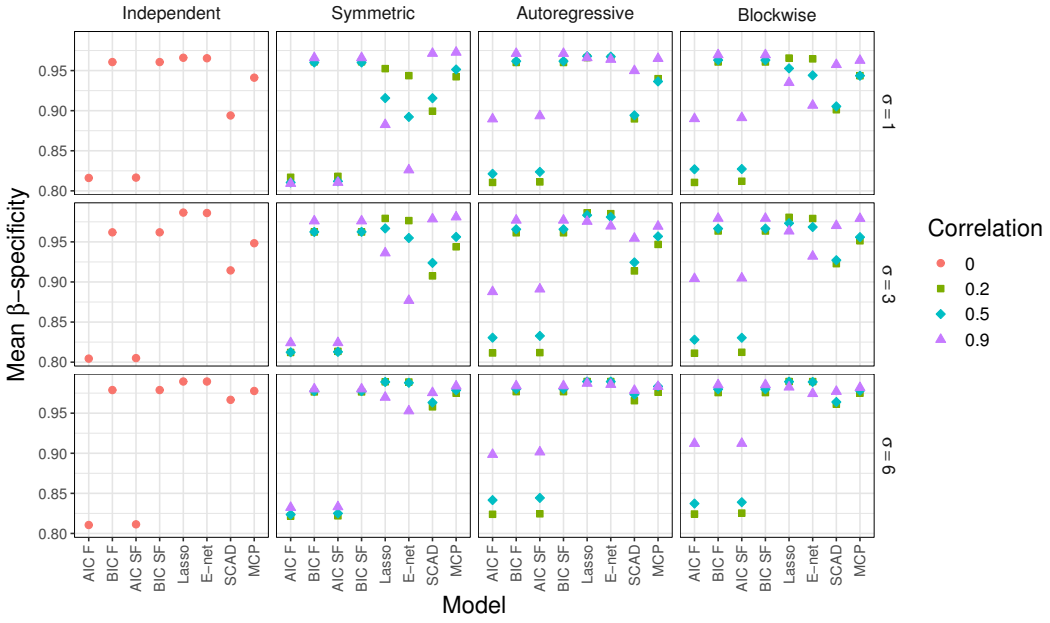


Figure 71: Average $\beta$-specificity for the non-linear simulations when $n = 1000$ and $p = 100$. See Table 71 for the corresponding data.

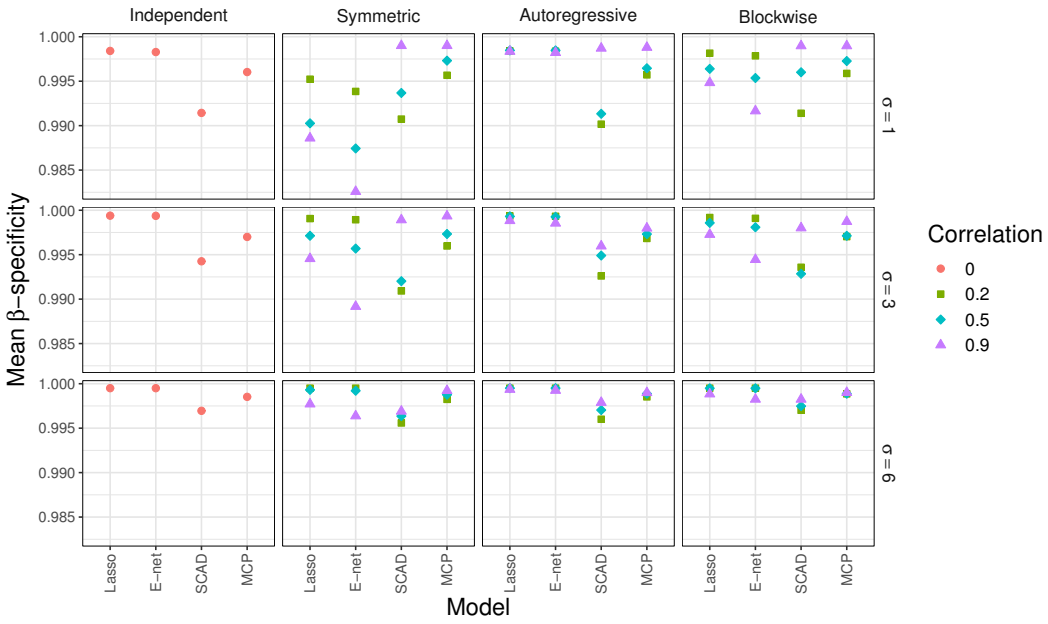


Figure 72: Average $\beta$-specificity for the non-linear simulations when $n = 1000$ and $p = 2000$. See Table 72 for the corresponding data.

# 4 Tables from the linear simulations

## 4.1 Tables for the training MSE of the linear simulations

Table 1: Mean and standard deviation of the training MSE for the linear simulations when $n = 50$ and $p = 10$. See Figure 1 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 | 0.77 | 0.17 |
| | AIC B | 0.81 | 0.18 | 0.81 | 0.18 | 0.82 | 0.17 | 0.81 | 0.17 | 0.81 | 0.17 | 0.81 | 0.18 | 0.81 | 0.18 | 0.81 | 0.17 | 0.81 | 0.18 | 0.81 | 0.17 |
| | BIC B | 0.85 | 0.18 | 0.85 | 0.18 | 0.85 | 0.18 | 0.86 | 0.18 | 0.85 | 0.18 | 0.86 | 0.19 | 0.85 | 0.18 | 0.85 | 0.18 | 0.85 | 0.18 | 0.86 | 0.19 |
| | AIC SB | 0.81 | 0.18 | 0.81 | 0.18 | 0.82 | 0.17 | 0.81 | 0.17 | 0.81 | 0.17 | 0.81 | 0.18 | 0.81 | 0.18 | 0.81 | 0.17 | 0.81 | 0.17 | 0.81 | 0.17 |
| | BIC SB | 0.85 | 0.18 | 0.85 | 0.18 | 0.85 | 0.18 | 0.86 | 0.18 | 0.85 | 0.18 | 0.86 | 0.19 | 0.85 | 0.18 | 0.85 | 0.18 | 0.85 | 0.18 | 0.86 | 0.19 |
| | AIC F | 0.81 | 0.18 | 0.82 | 0.18 | 0.82 | 0.18 | 0.82 | 0.18 | 0.81 | 0.17 | 0.82 | 0.18 | 0.88 | 0.27 | 0.81 | 0.17 | 0.82 | 0.18 | 0.84 | 0.22 |
| | BIC F | 0.86 | 0.18 | 0.86 | 0.19 | 0.85 | 0.18 | 0.86 | 0.19 | 0.86 | 0.17 | 0.86 | 0.19 | 1.06 | 0.40 | 0.85 | 0.18 | 0.86 | 0.19 | 0.93 | 0.30 |
| | AIC SF | 0.81 | 0.18 | 0.82 | 0.18 | 0.82 | 0.18 | 0.82 | 0.18 | 0.81 | 0.17 | 0.82 | 0.18 | 0.88 | 0.27 | 0.81 | 0.17 | 0.82 | 0.18 | 0.84 | 0.23 |
| | BIC SF | 0.86 | 0.18 | 0.86 | 0.19 | 0.85 | 0.18 | 0.86 | 0.19 | 0.86 | 0.17 | 0.86 | 0.19 | 1.06 | 0.39 | 0.85 | 0.18 | 0.86 | 0.19 | 0.93 | 0.30 |
| | Ridge | 1.04 | 0.21 | 1.06 | 0.22 | 1.18 | 0.24 | 1.51 | 0.31 | 1.05 | 0.21 | 1.12 | 0.23 | 1.45 | 0.28 | 1.05 | 0.23 | 1.14 | 0.22 | 1.45 | 0.27 |
| | Lasso | 1.09 | 0.25 | 1.08 | 0.25 | 1.07 | 0.25 | 1.12 | 0.29 | 1.08 | 0.24 | 1.06 | 0.25 | 1.10 | 0.28 | 1.08 | 0.24 | 1.07 | 0.25 | 1.08 | 0.26 |
| | E-net | 1.08 | 0.25 | 1.08 | 0.25 | 1.07 | 0.24 | 1.12 | 0.28 | 1.08 | 0.24 | 1.05 | 0.24 | 1.09 | 0.28 | 1.08 | 0.25 | 1.07 | 0.25 | 1.07 | 0.25 |
| | SCAD | 0.87 | 0.20 | 0.87 | 0.19 | 0.87 | 0.19 | 0.87 | 0.22 | 0.86 | 0.18 | 0.88 | 0.20 | 0.86 | 0.20 | 0.86 | 0.18 | 0.86 | 0.20 | 0.86 | 0.19 |
| | MCP | 0.87 | 0.19 | 0.86 | 0.19 | 0.87 | 0.20 | 0.87 | 0.25 | 0.86 | 0.18 | 0.88 | 0.19 | 0.85 | 0.19 | 0.86 | 0.18 | 0.86 | 0.20 | 0.87 | 0.19 |
| | XGBoost | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | RF | 1.25 | 0.22 | 1.17 | 0.21 | 0.94 | 0.21 | 0.46 | 0.11 | 1.18 | 0.20 | 0.99 | 0.16 | 0.50 | 0.14 | 1.17 | 0.20 | 1.00 | 0.19 | 0.51 | 0.10 |
| | SVM | 0.23 | 0.11 | 0.23 | 0.16 | 0.27 | 0.16 | 0.72 | 0.31 | 0.19 | 0.07 | 0.23 | 0.18 | 0.61 | 0.45 | 0.20 | 0.09 | 0.25 | 0.23 | 0.59 | 0.27 |
| 3 | OLS | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 | 6.93 | 1.49 |
| | AIC B | 7.30 | 1.60 | 7.32 | 1.61 | 7.33 | 1.63 | 7.35 | 1.62 | 7.31 | 1.61 | 7.32 | 1.57 | 7.32 | 1.58 | 7.33 | 1.59 | 7.31 | 1.58 | 7.31 | 1.61 |
| | BIC B | 7.67 | 1.66 | 7.66 | 1.69 | 7.62 | 1.63 | 7.75 | 1.64 | 7.68 | 1.59 | 7.66 | 1.67 | 7.65 | 1.64 | 7.67 | 1.66 | 7.63 | 1.64 | 7.74 | 1.72 |
| | AIC SB | 7.30 | 1.60 | 7.31 | 1.61 | 7.32 | 1.62 | 7.35 | 1.62 | 7.31 | 1.61 | 7.32 | 1.57 | 7.32 | 1.58 | 7.33 | 1.59 | 7.30 | 1.57 | 7.31 | 1.61 |
| | BIC SB | 7.67 | 1.66 | 7.66 | 1.70 | 7.62 | 1.63 | 7.75 | 1.64 | 7.68 | 1.59 | 7.65 | 1.65 | 7.65 | 1.64 | 7.67 | 1.66 | 7.63 | 1.64 | 7.73 | 1.71 |
| | AIC F | 7.33 | 1.60 | 7.34 | 1.61 | 7.35 | 1.61 | 7.41 | 1.61 | 7.37 | 1.61 | 7.35 | 1.60 | 7.62 | 1.96 | 7.37 | 1.60 | 7.36 | 1.58 | 7.44 | 1.67 |
| | BIC F | 7.74 | 1.64 | 7.69 | 1.72 | 7.68 | 1.63 | 7.95 | 1.88 | 7.72 | 1.61 | 7.72 | 1.68 | 9.40 | 3.27 | 7.68 | 1.68 | 7.73 | 1.64 | 8.11 | 2.07 |
| | AIC SF | 7.33 | 1.60 | 7.34 | 1.61 | 7.35 | 1.61 | 7.41 | 1.61 | 7.37 | 1.61 | 7.35 | 1.60 | 7.65 | 1.97 | 7.37 | 1.60 | 7.36 | 1.58 | 7.44 | 1.66 |
| | BIC SF | 7.74 | 1.64 | 7.69 | 1.72 | 7.69 | 1.64 | 7.95 | 1.88 | 7.72 | 1.61 | 7.72 | 1.68 | 9.40 | 3.27 | 7.68 | 1.68 | 7.73 | 1.64 | 8.11 | 2.07 |
| | Ridge | 9.37 | 1.86 | 9.62 | 2.02 | 10.49 | 2.24 | 13.53 | 2.55 | 9.49 | 2.02 | 10.22 | 2.12 | 12.99 | 2.53 | 9.51 | 1.90 | 10.24 | 2.15 | 13.02 | 2.66 |
| | Lasso | 9.83 | 2.22 | 9.72 | 2.35 | 9.64 | 2.30 | 9.83 | 2.35 | 9.80 | 2.28 | 9.61 | 2.21 | 9.66 | 2.35 | 9.77 | 2.30 | 9.55 | 2.18 | 9.70 | 2.27 |
| | E-net | 9.75 | 2.22 | 9.68 | 2.29 | 9.63 | 2.31 | 9.84 | 2.30 | 9.76 | 2.27 | 9.58 | 2.22 | 9.63 | 2.31 | 9.76 | 2.30 | 9.50 | 2.13 | 9.65 | 2.23 |
| | SCAD | 7.84 | 1.77 | 7.84 | 1.81 | 7.92 | 1.77 | 7.68 | 1.61 | 7.76 | 1.72 | 7.90 | 1.82 | 7.66 | 1.72 | 7.72 | 1.79 | 7.90 | 1.71 | 7.76 | 1.71 |
| | MCP | 7.81 | 1.75 | 7.80 | 1.82 | 7.91 | 1.74 | 7.72 | 1.66 | 7.73 | 1.73 | 7.89 | 1.83 | 7.70 | 1.77 | 7.73 | 1.78 | 7.92 | 1.73 | 7.76 | 1.71 |
| | XGBoost | 0.06 | 0.08 | 0.06 | 0.07 | 0.06 | 0.08 | 0.09 | 0.13 | 0.04 | 0.07 | 0.06 | 0.08 | 0.07 | 0.11 | 0.05 | 0.08 | 0.05 | 0.08 | 0.06 | 0.11 |
| | RF | 11.21 | 2.01 | 10.31 | 1.71 | 8.44 | 1.59 | 4.04 | 0.96 | 10.34 | 1.71 | 9.13 | 1.62 | 4.47 | 0.99 | 10.19 | 1.78 | 8.90 | 1.52 | 4.55 | 1.03 |
| | SVM | 2.05 | 1.03 | 1.88 | 1.17 | 2.32 | 1.24 | 6.27 | 2.65 | 1.76 | 0.91 | 2.46 | 2.65 | 5.17 | 2.41 | 1.91 | 1.83 | 2.09 | 1.01 | 5.42 | 2.43 |
| 6 | OLS | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 | 27.74 | 5.95 |
| | AIC B | 29.19 | 6.40 | 29.26 | 6.44 | 29.31 | 6.51 | 29.40 | 6.47 | 29.25 | 6.45 | 29.29 | 6.28 | 29.30 | 6.32 | 29.33 | 6.35 | 29.25 | 6.30 | 29.23 | 6.44 |
| | BIC B | 30.68 | 6.62 | 30.64 | 6.76 | 30.47 | 6.53 | 31.01 | 6.58 | 30.70 | 6.35 | 30.64 | 6.70 | 30.59 | 6.58 | 30.67 | 6.63 | 30.51 | 6.54 | 30.97 | 6.89 |
| | AIC SB | 29.19 | 6.40 | 29.25 | 6.43 | 29.29 | 6.48 | 29.40 | 6.47 | 29.25 | 6.45 | 29.29 | 6.28 | 29.29 | 6.32 | 29.33 | 6.35 | 29.21 | 6.27 | 29.23 | 6.44 |
| | BIC SB | 30.68 | 6.62 | 30.62 | 6.79 | 30.47 | 6.53 | 31.01 | 6.58 | 30.70 | 6.35 | 30.60 | 6.58 | 30.59 | 6.58 | 30.67 | 6.63 | 30.51 | 6.54 | 30.93 | 6.84 |
| | AIC F | 29.31 | 6.41 | 29.36 | 6.43 | 29.38 | 6.45 | 29.65 | 6.42 | 29.48 | 6.45 | 29.40 | 6.39 | 30.49 | 7.83 | 29.47 | 6.41 | 29.43 | 6.31 | 29.77 | 6.67 |
| | BIC F | 30.94 | 6.56 | 30.76 | 6.90 | 30.74 | 6.53 | 31.79 | 7.54 | 30.87 | 6.45 | 30.87 | 6.74 | 37.59 | 13.09 | 30.74 | 6.72 | 30.92 | 6.56 | 32.43 | 8.26 |
| | AIC SF | 29.31 | 6.41 | 29.36 | 6.43 | 29.38 | 6.45 | 29.65 | 6.42 | 29.48 | 6.44 | 29.41 | 6.39 | 30.60 | 7.87 | 29.47 | 6.41 | 29.44 | 6.31 | 29.77 | 6.66 |
| | BIC SF | 30.94 | 6.56 | 30.76 | 6.90 | 30.76 | 6.55 | 31.79 | 7.54 | 30.87 | 6.45 | 30.87 | 6.74 | 37.60 | 13.09 | 30.74 | 6.72 | 30.93 | 6.55 | 32.43 | 8.26 |
| | Ridge | 37.50 | 7.43 | 38.48 | 8.08 | 41.94 | 8.98 | 54.12 | 10.20 | 37.97 | 8.08 | 40.86 | 8.49 | 51.97 | 10.11 | 38.05 | 7.59 | 40.95 | 8.59 | 52.09 | 10.63 |
| | Lasso | 39.32 | 8.88 | 38.90 | 9.42 | 38.57 | 9.18 | 39.32 | 9.40 | 39.19 | 9.11 | 38.42 | 8.85 | 38.62 | 9.39 | 39.08 | 9.20 | 38.20 | 8.71 | 38.81 | 9.07 |
| | E-net | 39.02 | 8.89 | 38.73 | 9.18 | 38.50 | 9.24 | 39.37 | 9.20 | 39.05 | 9.07 | 38.32 | 8.87 | 38.54 | 9.25 | 39.04 | 9.19 | 38.01 | 8.52 | 38.59 | 8.91 |
| | SCAD | 31.35 | 7.08 | 31.35 | 7.23 | 31.66 | 7.07 | 30.71 | 6.45 | 31.06 | 6.90 | 31.60 | 7.29 | 30.66 | 6.89 | 30.90 | 7.18 | 31.59 | 6.83 | 31.05 | 6.84 |
| | MCP | 31.25 | 6.98 | 31.19 | 7.29 | 31.63 | 6.96 | 30.86 | 6.65 | 30.94 | 6.94 | 31.56 | 7.33 | 30.80 | 7.09 | 30.93 | 7.12 | 31.70 | 6.93 | 31.05 | 6.85 |
| | XGBoost | 0.24 | 0.32 | 0.29 | 0.30 | 0.21 | 0.31 | 0.45 | 0.58 | 0.18 | 0.25 | 0.21 | 0.33 | 0.28 | 0.46 | 0.18 | 0.27 | 0.22 | 0.31 | 0.30 | 0.50 |
| | RF | 44.87 | 8.00 | 41.30 | 6.87 | 33.76 | 6.37 | 16.17 | 3.85 | 41.34 | 6.80 | 36.47 | 6.46 | 17.89 | 3.97 | 40.79 | 7.13 | 35.60 | 6.13 | 18.20 | 4.12 |
| | SVM | 8.22 | 4.13 | 7.50 | 4.68 | 9.53 | 6.14 | 24.99 | 10.31 | 7.04 | 3.64 | 9.85 | 10.59 | 20.90 | 9.73 | 7.63 | 7.31 | 8.36 | 4.04 | 21.67 | 11.60 |

Table 2: Mean and standard deviation of the training MSE for the linear simulations when $n = 50$ and $p = 100$. See Figure 2 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 16.98 | 3.71 | 14.10 | 3.02 | 9.63 | 1.72 | 3.11 | 0.61 | 15.92 | 3.74 | 13.75 | 2.76 | 6.53 | 1.39 | 14.80 | 3.09 | 10.64 | 2.14 | 4.13 | 0.89 |
| | Lasso | 1.37 | 0.46 | 1.34 | 0.45 | 1.20 | 0.44 | 1.38 | 0.41 | 1.41 | 0.50 | 1.38 | 0.53 | 1.79 | 0.53 | 1.36 | 0.43 | 1.27 | 0.55 | 1.48 | 0.55 |
| | E-net | 1.38 | 0.48 | 1.36 | 0.47 | 1.20 | 0.47 | 1.37 | 0.39 | 1.42 | 0.55 | 1.41 | 0.56 | 1.80 | 0.53 | 1.38 | 0.46 | 1.29 | 0.58 | 1.49 | 0.55 |
| | SCAD | 0.84 | 0.29 | 0.88 | 0.25 | 0.94 | 0.25 | 1.25 | 0.39 | 0.90 | 0.28 | 0.93 | 0.27 | 1.41 | 0.44 | 0.90 | 0.29 | 0.94 | 0.26 | 1.23 | 0.43 |
| | MCP | 0.90 | 0.29 | 0.92 | 0.25 | 0.96 | 0.24 | 1.18 | 0.38 | 0.95 | 0.28 | 0.94 | 0.29 | 1.43 | 0.46 | 0.96 | 0.30 | 0.96 | 0.28 | 1.18 | 0.46 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 1.70 | 0.29 | 1.56 | 0.29 | 1.10 | 0.20 | 0.47 | 0.09 | 1.60 | 0.33 | 1.25 | 0.21 | 0.52 | 0.13 | 1.56 | 0.30 | 1.12 | 0.20 | 0.50 | 0.11 |
| | SVM | 0.54 | 0.91 | 0.46 | 0.53 | 0.47 | 0.61 | 0.87 | 0.53 | 0.70 | 1.36 | 0.41 | 0.45 | 0.25 | 0.24 | 0.42 | 0.71 | 0.41 | 0.40 | 0.67 | 0.55 |
| 3 | Ridge | 152.82 | 33.38 | 127.16 | 29.14 | 86.66 | 18.70 | 27.80 | 5.77 | 139.47 | 30.76 | 123.60 | 25.72 | 58.74 | 12.46 | 130.48 | 26.46 | 93.78 | 21.72 | 36.47 | 6.31 |
| | Lasso | 12.35 | 4.12 | 11.64 | 4.20 | 11.51 | 4.13 | 12.31 | 4.03 | 11.52 | 4.69 | 12.66 | 6.75 | 16.20 | 4.87 | 11.52 | 4.51 | 11.97 | 5.15 | 13.05 | 4.69 |
| | E-net | 12.40 | 4.33 | 11.79 | 4.28 | 11.71 | 4.24 | 12.24 | 3.99 | 11.80 | 4.99 | 13.10 | 7.43 | 16.28 | 4.73 | 11.69 | 4.70 | 12.28 | 5.57 | 13.17 | 4.74 |
| | SCAD | 7.59 | 2.60 | 7.91 | 2.37 | 8.74 | 2.22 | 11.14 | 3.41 | 7.88 | 2.40 | 8.13 | 2.38 | 12.79 | 4.04 | 7.90 | 2.56 | 8.62 | 2.33 | 10.80 | 3.56 |
| | MCP | 8.10 | 2.61 | 8.28 | 2.31 | 8.96 | 2.26 | 10.66 | 3.47 | 8.16 | 2.40 | 8.55 | 2.49 | 13.12 | 4.02 | 8.22 | 2.75 | 8.84 | 2.31 | 10.22 | 3.28 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 15.26 | 2.63 | 13.54 | 2.57 | 10.19 | 1.83 | 4.18 | 0.95 | 14.41 | 2.58 | 11.51 | 2.09 | 4.70 | 1.22 | 13.82 | 2.55 | 10.11 | 1.95 | 4.30 | 0.94 |
| | SVM | 4.50 | 6.06 | 4.57 | 5.63 | 4.87 | 6.13 | 7.30 | 4.15 | 5.76 | 11.52 | 3.28 | 3.07 | 2.14 | 1.64 | 4.59 | 6.70 | 4.64 | 6.94 | 5.45 | 4.15 |
| 6 | Ridge | 611.28 | 133.53 | 508.65 | 116.54 | 346.64 | 74.78 | 111.20 | 23.09 | 557.86 | 123.04 | 494.42 | 102.89 | 234.94 | 49.86 | 521.93 | 105.84 | 375.14 | 86.89 | 145.88 | 25.25 |
| | Lasso | 49.38 | 16.47 | 46.54 | 16.79 | 46.05 | 16.50 | 49.24 | 16.13 | 46.09 | 18.76 | 50.63 | 26.99 | 64.78 | 19.48 | 46.08 | 18.05 | 47.89 | 20.60 | 52.20 | 18.77 |
| | E-net | 49.60 | 17.30 | 47.18 | 17.12 | 46.85 | 16.97 | 48.97 | 15.95 | 47.19 | 19.95 | 52.39 | 29.72 | 65.11 | 18.92 | 46.77 | 18.81 | 49.11 | 22.27 | 52.69 | 18.97 |
| | SCAD | 30.37 | 10.42 | 31.64 | 9.47 | 34.94 | 8.88 | 44.55 | 13.66 | 31.53 | 9.61 | 32.52 | 9.51 | 51.15 | 16.15 | 31.62 | 10.25 | 34.49 | 9.33 | 43.19 | 14.24 |
| | MCP | 32.38 | 10.46 | 33.11 | 9.25 | 35.83 | 9.05 | 42.64 | 13.87 | 32.65 | 9.59 | 34.21 | 9.96 | 52.48 | 16.07 | 32.86 | 10.99 | 35.38 | 9.23 | 40.86 | 13.13 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 60.87 | 10.44 | 54.21 | 10.32 | 40.78 | 7.32 | 16.77 | 3.82 | 57.69 | 10.29 | 46.13 | 8.42 | 18.81 | 4.88 | 55.32 | 10.18 | 40.47 | 7.73 | 17.23 | 3.76 |
| | SVM | 18.70 | 25.14 | 17.62 | 20.26 | 20.01 | 25.63 | 28.93 | 15.98 | 21.28 | 33.19 | 13.15 | 12.11 | 8.76 | 7.26 | 16.49 | 22.80 | 17.19 | 21.10 | 22.57 | 16.59 |

Table 3: Mean and standard deviation of the training MSE for the linear simulations when $n = 50$ and $p = 2000$. See Figure 3 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 17.23 | 3.46 | 15.65 | 3.69 | 9.67 | 2.21 | 2.96 | 0.62 | 17.04 | 3.79 | 15.27 | 3.38 | 10.61 | 3.21 | 16.38 | 4.05 | 11.43 | 4.31 | 2.39 | 1.25 |
| | Lasso | 2.71 | 1.60 | 2.69 | 2.38 | 2.34 | 1.62 | 1.75 | 0.48 | 3.52 | 2.59 | 5.13 | 2.22 | 2.31 | 0.60 | 3.84 | 2.51 | 4.22 | 1.75 | 1.91 | 0.54 |
| | E-net | 3.38 | 2.29 | 3.07 | 2.63 | 2.60 | 1.68 | 1.70 | 0.46 | 4.20 | 2.86 | 5.63 | 2.20 | 2.41 | 0.63 | 4.58 | 2.71 | 4.63 | 1.73 | 1.92 | 0.55 |
| | SCAD | 0.83 | 0.30 | 0.82 | 0.26 | 0.94 | 0.37 | 1.47 | 0.44 | 0.86 | 0.41 | 1.45 | 1.19 | 1.48 | 0.52 | 0.91 | 0.34 | 0.95 | 0.61 | 1.52 | 0.45 |
| | MCP | 0.94 | 0.30 | 0.94 | 0.28 | 1.09 | 0.45 | 1.43 | 0.42 | 1.08 | 1.13 | 2.21 | 1.61 | 1.55 | 0.45 | 1.04 | 0.42 | 1.24 | 0.87 | 1.58 | 0.45 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 2.14 | 0.40 | 1.90 | 0.39 | 1.30 | 0.28 | 0.45 | 0.10 | 1.91 | 0.40 | 1.46 | 0.31 | 0.61 | 0.13 | 1.88 | 0.42 | 1.28 | 0.26 | 0.54 | 0.12 |
| | SVM | 4.56 | 3.73 | 2.45 | 2.87 | 1.29 | 1.35 | 0.89 | 0.54 | 4.58 | 3.69 | 3.95 | 3.45 | 1.36 | 1.97 | 2.73 | 3.08 | 1.07 | 1.52 | 0.22 | 0.21 |
| 3 | Ridge | 155.11 | 31.15 | 137.31 | 31.01 | 87.42 | 19.36 | 26.04 | 5.18 | 155.75 | 34.85 | 137.91 | 30.96 | 92.22 | 27.90 | 146.37 | 34.31 | 104.27 | 35.08 | 21.61 | 10.88 |
| | Lasso | 24.35 | 14.44 | 24.16 | 19.02 | 24.92 | 15.15 | 14.97 | 4.20 | 32.48 | 24.29 | 48.45 | 18.89 | 20.59 | 5.75 | 29.14 | 20.27 | 38.08 | 14.24 | 16.86 | 4.64 |
| | E-net | 30.45 | 20.58 | 27.98 | 21.68 | 27.04 | 15.38 | 14.78 | 3.95 | 38.72 | 27.41 | 53.16 | 19.89 | 21.01 | 6.51 | 35.98 | 21.93 | 41.61 | 13.92 | 16.97 | 4.85 |
| | SCAD | 7.44 | 2.74 | 7.49 | 2.48 | 8.13 | 4.71 | 13.05 | 4.07 | 7.49 | 2.76 | 11.59 | 9.25 | 13.93 | 4.23 | 7.39 | 2.90 | 8.80 | 5.48 | 14.12 | 3.79 |
| | MCP | 8.45 | 2.73 | 8.85 | 2.36 | 9.33 | 5.25 | 12.61 | 3.70 | 9.20 | 4.29 | 15.83 | 12.14 | 14.64 | 3.53 | 8.79 | 2.88 | 11.97 | 8.47 | 14.29 | 3.68 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 19.26 | 3.62 | 16.43 | 3.32 | 11.97 | 2.38 | 4.11 | 0.94 | 17.28 | 3.91 | 13.17 | 2.82 | 5.57 | 1.25 | 16.95 | 3.49 | 11.83 | 2.58 | 4.67 | 1.06 |
| | SVM | 42.13 | 33.63 | 17.95 | 21.15 | 13.24 | 15.02 | 7.71 | 4.36 | 44.52 | 34.25 | 34.41 | 30.21 | 11.86 | 15.46 | 30.65 | 29.90 | 9.01 | 14.85 | 1.75 | 0.85 |
| 6 | Ridge | 620.44 | 124.62 | 549.25 | 124.06 | 349.70 | 77.44 | 104.17 | 20.72 | 615.50 | 134.69 | 551.66 | 123.85 | 368.87 | 111.59 | 585.48 | 137.22 | 417.07 | 140.32 | 86.42 | 43.51 |
| | Lasso | 97.39 | 57.75 | 96.63 | 76.09 | 99.67 | 60.62 | 59.87 | 16.79 | 136.83 | 107.80 | 193.78 | 75.58 | 82.38 | 23.01 | 116.55 | 81.09 | 152.30 | 56.97 | 67.46 | 18.56 |
| | E-net | 121.80 | 82.32 | 111.94 | 86.72 | 108.17 | 61.53 | 59.12 | 15.80 | 160.64 | 114.39 | 212.65 | 79.54 | 84.02 | 26.03 | 143.93 | 87.70 | 166.45 | 55.69 | 67.88 | 19.42 |
| | SCAD | 29.74 | 10.96 | 29.97 | 9.91 | 32.51 | 18.84 | 52.19 | 16.28 | 29.26 | 10.97 | 46.37 | 36.99 | 55.71 | 16.92 | 29.57 | 11.59 | 35.21 | 21.92 | 56.46 | 15.15 |
| | MCP | 33.80 | 10.93 | 35.41 | 9.43 | 37.32 | 21.00 | 50.46 | 14.80 | 38.95 | 40.73 | 63.33 | 48.56 | 58.55 | 14.14 | 35.17 | 11.50 | 47.88 | 33.86 | 57.17 | 14.71 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 76.87 | 14.15 | 65.66 | 13.13 | 47.66 | 9.50 | 16.42 | 3.76 | 68.43 | 14.86 | 52.70 | 11.31 | 22.30 | 4.95 | 67.58 | 13.67 | 47.39 | 10.35 | 18.75 | 4.29 |
| | SVM | 168.49 | 137.29 | 81.76 | 100.97 | 51.02 | 58.93 | 31.87 | 19.60 | 149.20 | 125.77 | 126.61 | 112.50 | 48.41 | 69.21 | 123.76 | 125.31 | 34.76 | 49.83 | 7.00 | 3.41 |

Table 4: Mean and standard deviation of the training MSE for the linear simulations when $n = 200$ and $p = 10$. See Figure 4 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 | 0.95 | 0.09 |
| | AIC B | 0.96 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.96 | 0.09 | 0.96 | 0.09 | 0.96 | 0.09 | 0.97 | 0.09 | 0.96 | 0.09 |
| | BIC B | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.10 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 |
| | AIC SB | 0.96 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.96 | 0.09 | 0.96 | 0.09 | 0.96 | 0.09 | 0.97 | 0.09 | 0.96 | 0.09 |
| | BIC SB | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.10 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 |
| | AIC F | 0.96 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.96 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 |
| | BIC F | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.99 | 0.10 | 0.98 | 0.09 | 0.98 | 0.09 | 0.99 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 |
| | AIC SF | 0.96 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.96 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 |
| | BIC SF | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.99 | 0.10 | 0.98 | 0.09 | 0.98 | 0.09 | 0.99 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 |
| | Ridge | 1.12 | 0.11 | 1.15 | 0.10 | 1.22 | 0.11 | 1.45 | 0.13 | 1.14 | 0.10 | 1.21 | 0.11 | 1.40 | 0.12 | 1.14 | 0.11 | 1.21 | 0.10 | 1.43 | 0.12 |
| | Lasso | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.07 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.07 | 0.11 |
| | E-net | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.07 | 0.11 | 1.08 | 0.11 | 1.08 | 0.11 | 1.07 | 0.11 |
| | SCAD | 0.97 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.97 | 0.09 | 0.98 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.98 | 0.09 |
| | MCP | 0.97 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.98 | 0.09 | 0.97 | 0.09 | 0.97 | 0.09 | 0.98 | 0.09 |
| | XGBoost | 0.29 | 0.08 | 0.28 | 0.09 | 0.30 | 0.07 | 0.18 | 0.17 | 0.28 | 0.08 | 0.28 | 0.08 | 0.22 | 0.16 | 0.30 | 0.07 | 0.28 | 0.09 | 0.26 | 0.15 |
| | RF | 0.62 | 0.06 | 0.63 | 0.06 | 0.57 | 0.05 | 0.32 | 0.03 | 0.64 | 0.05 | 0.64 | 0.05 | 0.35 | 0.03 | 0.64 | 0.05 | 0.64 | 0.05 | 0.38 | 0.04 |
| | SVM | 0.38 | 0.20 | 0.37 | 0.19 | 0.45 | 0.17 | 0.79 | 0.15 | 0.39 | 0.22 | 0.38 | 0.15 | 0.66 | 0.10 | 0.35 | 0.16 | 0.37 | 0.10 | 0.71 | 0.12 |
| 3 | OLS | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 | 8.57 | 0.81 |
| | AIC B | 8.68 | 0.80 | 8.69 | 0.82 | 8.68 | 0.82 | 8.68 | 0.81 | 8.68 | 0.81 | 8.68 | 0.82 | 8.68 | 0.81 | 8.69 | 0.81 | 8.68 | 0.81 | 8.68 | 0.82 |
| | BIC B | 8.82 | 0.83 | 8.81 | 0.84 | 8.82 | 0.81 | 8.85 | 0.84 | 8.81 | 0.83 | 8.82 | 0.82 | 8.84 | 0.85 | 8.79 | 0.83 | 8.82 | 0.82 | 8.86 | 0.83 |
| | AIC SB | 8.68 | 0.80 | 8.69 | 0.82 | 8.68 | 0.82 | 8.68 | 0.81 | 8.68 | 0.81 | 8.68 | 0.82 | 8.68 | 0.81 | 8.69 | 0.81 | 8.68 | 0.81 | 8.68 | 0.82 |
| | BIC SB | 8.82 | 0.83 | 8.81 | 0.84 | 8.82 | 0.81 | 8.85 | 0.84 | 8.81 | 0.83 | 8.82 | 0.82 | 8.84 | 0.85 | 8.79 | 0.83 | 8.82 | 0.82 | 8.86 | 0.83 |
| | AIC F | 8.68 | 0.80 | 8.69 | 0.82 | 8.69 | 0.82 | 8.69 | 0.82 | 8.69 | 0.81 | 8.69 | 0.82 | 8.71 | 0.82 | 8.69 | 0.81 | 8.69 | 0.81 | 8.70 | 0.82 |
| | BIC F | 8.82 | 0.83 | 8.81 | 0.84 | 8.82 | 0.81 | 8.87 | 0.83 | 8.81 | 0.83 | 8.84 | 0.83 | 8.86 | 0.85 | 8.79 | 0.83 | 8.83 | 0.82 | 8.87 | 0.84 |
| | AIC SF | 8.68 | 0.80 | 8.69 | 0.82 | 8.69 | 0.82 | 8.69 | 0.82 | 8.69 | 0.81 | 8.69 | 0.82 | 8.71 | 0.82 | 8.69 | 0.81 | 8.69 | 0.81 | 8.71 | 0.82 |
| | BIC SF | 8.82 | 0.83 | 8.81 | 0.84 | 8.82 | 0.81 | 8.87 | 0.83 | 8.81 | 0.83 | 8.84 | 0.83 | 8.86 | 0.85 | 8.79 | 0.83 | 8.83 | 0.82 | 8.87 | 0.84 |
| | Ridge | 10.11 | 0.95 | 10.25 | 0.87 | 10.96 | 0.91 | 13.15 | 1.14 | 10.26 | 0.94 | 10.89 | 1.02 | 12.66 | 1.06 | 10.27 | 0.93 | 10.84 | 0.91 | 13.06 | 1.07 |
| | Lasso | 9.74 | 0.97 | 9.70 | 0.97 | 9.70 | 0.96 | 9.72 | 0.98 | 9.74 | 0.97 | 9.72 | 0.97 | 9.66 | 0.99 | 9.71 | 0.98 | 9.67 | 0.99 | 9.68 | 0.97 |
| | E-net | 9.75 | 0.99 | 9.70 | 0.97 | 9.69 | 0.97 | 9.70 | 0.97 | 9.74 | 0.99 | 9.72 | 0.98 | 9.66 | 0.98 | 9.71 | 0.97 | 9.67 | 0.99 | 9.66 | 0.97 |
| | SCAD | 8.75 | 0.80 | 8.77 | 0.83 | 8.78 | 0.80 | 8.78 | 0.84 | 8.79 | 0.80 | 8.77 | 0.81 | 8.77 | 0.85 | 8.76 | 0.82 | 8.77 | 0.80 | 8.81 | 0.85 |
| | MCP | 8.77 | 0.80 | 8.79 | 0.82 | 8.78 | 0.80 | 8.79 | 0.85 | 8.79 | 0.81 | 8.77 | 0.80 | 8.78 | 0.85 | 8.76 | 0.82 | 8.78 | 0.80 | 8.79 | 0.84 |
| | XGBoost | 2.66 | 0.62 | 2.62 | 0.72 | 2.64 | 0.74 | 1.80 | 1.62 | 2.61 | 0.68 | 2.65 | 0.71 | 2.00 | 1.45 | 2.61 | 0.63 | 2.51 | 0.84 | 2.03 | 1.41 |
| | RF | 5.59 | 0.51 | 5.64 | 0.45 | 5.09 | 0.42 | 2.89 | 0.28 | 5.67 | 0.54 | 5.81 | 0.51 | 3.24 | 0.35 | 5.67 | 0.43 | 5.80 | 0.49 | 3.47 | 0.39 |
| | SVM | 3.39 | 1.84 | 3.24 | 1.54 | 4.06 | 1.55 | 7.12 | 1.01 | 3.29 | 1.61 | 3.19 | 1.02 | 6.10 | 1.04 | 3.26 | 1.64 | 3.41 | 1.03 | 6.41 | 1.07 |
| 6 | OLS | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 | 34.30 | 3.22 |
| | AIC B | 34.70 | 3.21 | 34.76 | 3.28 | 34.74 | 3.28 | 34.73 | 3.26 | 34.73 | 3.25 | 34.71 | 3.28 | 34.71 | 3.25 | 34.74 | 3.25 | 34.70 | 3.26 | 34.71 | 3.29 |
| | BIC B | 35.27 | 3.31 | 35.26 | 3.35 | 35.29 | 3.26 | 35.40 | 3.35 | 35.25 | 3.31 | 35.30 | 3.28 | 35.36 | 3.40 | 35.14 | 3.31 | 35.27 | 3.28 | 35.42 | 3.33 |
| | AIC SB | 34.70 | 3.21 | 34.76 | 3.28 | 34.74 | 3.28 | 34.73 | 3.26 | 34.73 | 3.25 | 34.71 | 3.28 | 34.71 | 3.25 | 34.74 | 3.25 | 34.70 | 3.26 | 34.71 | 3.29 |
| | BIC SB | 35.27 | 3.31 | 35.26 | 3.35 | 35.29 | 3.26 | 35.40 | 3.35 | 35.25 | 3.31 | 35.30 | 3.28 | 35.36 | 3.40 | 35.14 | 3.31 | 35.27 | 3.28 | 35.42 | 3.33 |
| | AIC F | 34.71 | 3.22 | 34.76 | 3.28 | 34.75 | 3.28 | 34.77 | 3.27 | 34.74 | 3.25 | 34.76 | 3.27 | 34.83 | 3.29 | 34.75 | 3.25 | 34.75 | 3.23 | 34.82 | 3.27 |
| | BIC F | 35.27 | 3.31 | 35.26 | 3.35 | 35.29 | 3.26 | 35.49 | 3.32 | 35.25 | 3.31 | 35.34 | 3.32 | 35.44 | 3.38 | 35.17 | 3.33 | 35.30 | 3.29 | 35.50 | 3.38 |
| | AIC SF | 34.71 | 3.22 | 34.76 | 3.28 | 34.75 | 3.28 | 34.77 | 3.27 | 34.74 | 3.25 | 34.76 | 3.27 | 34.83 | 3.29 | 34.75 | 3.25 | 34.75 | 3.23 | 34.82 | 3.27 |
| | BIC SF | 35.27 | 3.31 | 35.26 | 3.35 | 35.29 | 3.26 | 35.49 | 3.32 | 35.25 | 3.31 | 35.34 | 3.32 | 35.45 | 3.40 | 35.17 | 3.33 | 35.30 | 3.29 | 35.50 | 3.38 |
| | Ridge | 40.44 | 3.81 | 41.01 | 3.48 | 43.83 | 3.63 | 52.60 | 4.57 | 41.06 | 3.78 | 43.57 | 4.09 | 50.65 | 4.23 | 41.08 | 3.72 | 43.35 | 3.64 | 52.23 | 4.26 |
| | Lasso | 38.96 | 3.89 | 38.81 | 3.87 | 38.79 | 3.85 | 38.89 | 3.93 | 38.96 | 3.89 | 38.86 | 3.89 | 38.66 | 3.97 | 38.82 | 3.92 | 38.68 | 3.96 | 38.72 | 3.88 |
| | E-net | 38.99 | 3.94 | 38.82 | 3.89 | 38.76 | 3.87 | 38.82 | 3.89 | 38.94 | 3.95 | 38.87 | 3.91 | 38.63 | 3.93 | 38.83 | 3.89 | 38.66 | 3.97 | 38.64 | 3.90 |
| | SCAD | 35.00 | 3.18 | 35.10 | 3.30 | 35.12 | 3.21 | 35.10 | 3.35 | 35.16 | 3.21 | 35.10 | 3.23 | 35.10 | 3.40 | 35.03 | 3.26 | 35.08 | 3.20 | 35.23 | 3.41 |
| | MCP | 35.07 | 3.21 | 35.14 | 3.28 | 35.11 | 3.21 | 35.15 | 3.40 | 35.17 | 3.26 | 35.10 | 3.21 | 35.11 | 3.41 | 35.04 | 3.27 | 35.10 | 3.21 | 35.15 | 3.38 |
| | XGBoost | 10.72 | 2.51 | 10.55 | 2.78 | 10.27 | 3.22 | 7.50 | 6.52 | 10.24 | 2.80 | 10.08 | 2.98 | 7.75 | 5.92 | 10.13 | 2.88 | 10.01 | 3.38 | 8.79 | 5.38 |
| | RF | 22.38 | 2.08 | 22.55 | 1.79 | 20.35 | 1.66 | 11.55 | 1.10 | 22.70 | 2.18 | 23.22 | 2.04 | 12.96 | 1.39 | 22.69 | 1.73 | 23.17 | 1.96 | 13.89 | 1.53 |
| | SVM | 13.54 | 7.36 | 12.97 | 6.14 | 16.26 | 6.20 | 28.47 | 4.00 | 13.15 | 6.46 | 12.78 | 4.08 | 24.75 | 4.67 | 13.05 | 6.56 | 13.65 | 4.10 | 25.58 | 4.09 |

Table 5: Mean and standard deviation of the training MSE for the linear simulations when $n = 200$ and $p = 100$. See Figure 5 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 | 0.50 | 0.07 |
| | AIC F | 0.66 | 0.10 | 0.66 | 0.10 | 0.67 | 0.10 | 0.67 | 0.10 | 0.66 | 0.10 | 0.70 | 0.11 | 0.81 | 0.12 | 0.67 | 0.10 | 0.68 | 0.10 | 0.80 | 0.12 |
| | BIC F | 0.90 | 0.11 | 0.90 | 0.11 | 0.91 | 0.11 | 0.92 | 0.12 | 0.90 | 0.11 | 0.92 | 0.11 | 0.96 | 0.11 | 0.91 | 0.11 | 0.93 | 0.11 | 0.95 | 0.10 |
| | AIC SF | 0.66 | 0.10 | 0.66 | 0.09 | 0.67 | 0.10 | 0.67 | 0.10 | 0.66 | 0.10 | 0.70 | 0.10 | 0.81 | 0.12 | 0.67 | 0.10 | 0.68 | 0.11 | 0.80 | 0.12 |
| | BIC SF | 0.90 | 0.11 | 0.90 | 0.11 | 0.91 | 0.11 | 0.92 | 0.12 | 0.90 | 0.11 | 0.92 | 0.11 | 0.96 | 0.11 | 0.91 | 0.11 | 0.93 | 0.11 | 0.95 | 0.10 |
| | Ridge | 0.74 | 0.11 | 0.78 | 0.11 | 0.91 | 0.14 | 1.33 | 0.20 | 0.77 | 0.11 | 0.86 | 0.12 | 1.19 | 0.15 | 0.78 | 0.11 | 0.89 | 0.12 | 1.31 | 0.20 |
| | Lasso | 1.14 | 0.14 | 1.12 | 0.14 | 1.11 | 0.13 | 1.11 | 0.14 | 1.14 | 0.14 | 1.15 | 0.15 | 1.10 | 0.14 | 1.14 | 0.15 | 1.12 | 0.13 | 1.11 | 0.13 |
| | E-net | 1.16 | 0.14 | 1.13 | 0.14 | 1.11 | 0.13 | 1.11 | 0.14 | 1.15 | 0.14 | 1.16 | 0.15 | 1.10 | 0.14 | 1.15 | 0.15 | 1.13 | 0.13 | 1.11 | 0.13 |
| | SCAD | 0.95 | 0.12 | 0.95 | 0.11 | 0.96 | 0.11 | 1.00 | 0.11 | 0.95 | 0.11 | 0.95 | 0.11 | 0.99 | 0.11 | 0.95 | 0.11 | 0.95 | 0.11 | 0.98 | 0.11 |
| | MCP | 0.97 | 0.11 | 0.96 | 0.11 | 0.97 | 0.11 | 1.00 | 0.11 | 0.96 | 0.11 | 0.96 | 0.11 | 1.00 | 0.11 | 0.97 | 0.11 | 0.96 | 0.11 | 0.99 | 0.10 |
| | XGBoost | 0.03 | 0.02 | 0.04 | 0.01 | 0.05 | 0.02 | 0.08 | 0.07 | 0.03 | 0.02 | 0.04 | 0.02 | 0.07 | 0.05 | 0.04 | 0.02 | 0.05 | 0.03 | 0.08 | 0.07 |
| | RF | 0.85 | 0.07 | 0.88 | 0.07 | 0.73 | 0.07 | 0.35 | 0.04 | 0.87 | 0.07 | 0.80 | 0.07 | 0.35 | 0.04 | 0.87 | 0.07 | 0.70 | 0.06 | 0.34 | 0.04 |
| | SVM | 0.21 | 0.05 | 0.21 | 0.06 | 0.23 | 0.06 | 0.62 | 0.19 | 0.21 | 0.04 | 0.18 | 0.03 | 0.20 | 0.04 | 0.21 | 0.04 | 0.21 | 0.06 | 0.46 | 0.17 |
| 3 | OLS | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 | 4.53 | 0.63 |
| | AIC F | 5.96 | 0.87 | 5.94 | 0.88 | 5.96 | 0.88 | 5.98 | 0.85 | 5.92 | 0.87 | 6.34 | 0.90 | 7.23 | 1.01 | 6.06 | 0.88 | 6.18 | 0.97 | 7.27 | 1.17 |
| | BIC F | 8.08 | 0.99 | 8.23 | 1.03 | 8.26 | 0.95 | 8.23 | 0.96 | 8.16 | 0.95 | 8.22 | 0.99 | 8.58 | 1.01 | 8.20 | 0.91 | 8.34 | 1.01 | 8.57 | 0.93 |
| | AIC SF | 5.96 | 0.86 | 5.94 | 0.91 | 6.00 | 0.87 | 5.99 | 0.84 | 5.96 | 0.86 | 6.36 | 0.93 | 7.26 | 0.97 | 6.07 | 0.87 | 6.19 | 0.96 | 7.29 | 1.15 |
| | BIC SF | 8.08 | 0.99 | 8.23 | 1.03 | 8.26 | 0.94 | 8.23 | 0.96 | 8.16 | 0.95 | 8.23 | 0.99 | 8.59 | 1.01 | 8.20 | 0.91 | 8.34 | 1.00 | 8.57 | 0.93 |
| | Ridge | 6.64 | 0.97 | 7.09 | 1.06 | 8.05 | 1.15 | 11.95 | 1.80 | 6.96 | 0.99 | 7.74 | 1.02 | 10.66 | 1.36 | 7.05 | 0.93 | 8.21 | 1.10 | 11.67 | 1.66 |
| | Lasso | 10.30 | 1.25 | 10.18 | 1.21 | 10.06 | 1.18 | 10.05 | 1.16 | 10.30 | 1.26 | 10.33 | 1.26 | 9.92 | 1.21 | 10.25 | 1.20 | 10.13 | 1.20 | 10.00 | 1.15 |
| | E-net | 10.40 | 1.29 | 10.22 | 1.21 | 10.06 | 1.19 | 10.06 | 1.13 | 10.35 | 1.32 | 10.37 | 1.29 | 9.91 | 1.20 | 10.32 | 1.25 | 10.13 | 1.21 | 10.04 | 1.19 |
| | SCAD | 8.55 | 1.04 | 8.60 | 0.98 | 8.68 | 0.91 | 8.90 | 1.03 | 8.57 | 0.98 | 8.51 | 0.96 | 8.90 | 0.95 | 8.55 | 0.93 | 8.58 | 0.93 | 8.89 | 0.96 |
| | MCP | 8.69 | 1.01 | 8.71 | 0.97 | 8.75 | 0.94 | 8.89 | 1.02 | 8.70 | 0.97 | 8.65 | 0.99 | 8.97 | 0.97 | 8.64 | 0.93 | 8.67 | 0.94 | 8.90 | 0.97 |
| | XGBoost | 0.32 | 0.13 | 0.35 | 0.15 | 0.45 | 0.26 | 0.71 | 0.69 | 0.31 | 0.15 | 0.35 | 0.20 | 0.55 | 0.42 | 0.30 | 0.18 | 0.41 | 0.22 | 0.56 | 0.57 |
| | RF | 7.62 | 0.63 | 7.84 | 0.61 | 6.46 | 0.60 | 3.13 | 0.35 | 7.75 | 0.62 | 7.24 | 0.61 | 3.18 | 0.39 | 7.90 | 0.66 | 6.47 | 0.53 | 3.01 | 0.28 |
| | SVM | 1.91 | 0.41 | 1.83 | 0.31 | 2.00 | 0.43 | 5.76 | 1.46 | 1.85 | 0.36 | 1.70 | 0.40 | 1.76 | 0.36 | 2.02 | 0.46 | 2.06 | 0.53 | 3.96 | 1.07 |
| 6 | OLS | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 | 18.14 | 2.50 |
| | AIC F | 23.83 | 3.48 | 23.76 | 3.54 | 23.86 | 3.54 | 23.93 | 3.38 | 23.68 | 3.48 | 25.34 | 3.59 | 28.92 | 4.06 | 24.25 | 3.50 | 24.71 | 3.89 | 29.08 | 4.67 |
| | BIC F | 32.30 | 3.97 | 32.93 | 4.11 | 33.04 | 3.79 | 32.92 | 3.83 | 32.64 | 3.79 | 32.89 | 3.97 | 34.33 | 4.04 | 32.79 | 3.63 | 33.34 | 4.02 | 34.26 | 3.71 |
| | AIC SF | 23.82 | 3.44 | 23.77 | 3.64 | 23.99 | 3.50 | 23.95 | 3.35 | 23.83 | 3.42 | 25.43 | 3.73 | 29.03 | 3.89 | 24.28 | 3.46 | 24.75 | 3.83 | 29.16 | 4.62 |
| | BIC SF | 32.33 | 3.95 | 32.94 | 4.10 | 33.05 | 3.77 | 32.92 | 3.83 | 32.64 | 3.79 | 32.90 | 3.96 | 34.35 | 4.05 | 32.79 | 3.64 | 33.35 | 4.02 | 34.26 | 3.71 |
| | Ridge | 26.57 | 3.86 | 28.36 | 4.25 | 32.21 | 4.62 | 47.81 | 7.18 | 27.84 | 3.96 | 30.96 | 4.10 | 42.65 | 5.45 | 28.18 | 3.73 | 32.84 | 4.41 | 46.66 | 6.64 |
| | Lasso | 41.22 | 5.00 | 40.72 | 4.83 | 40.25 | 4.71 | 40.19 | 4.63 | 41.19 | 5.05 | 41.30 | 5.04 | 39.70 | 4.84 | 41.01 | 4.79 | 40.54 | 4.81 | 39.99 | 4.61 |
| | E-net | 41.58 | 5.16 | 40.88 | 4.83 | 40.26 | 4.75 | 40.23 | 4.53 | 41.39 | 5.28 | 41.48 | 5.17 | 39.62 | 4.78 | 41.29 | 5.01 | 40.52 | 4.82 | 40.18 | 4.77 |
| | SCAD | 34.19 | 4.18 | 34.41 | 3.91 | 34.73 | 3.66 | 35.58 | 4.12 | 34.29 | 3.91 | 34.03 | 3.84 | 35.58 | 3.79 | 34.20 | 3.70 | 34.30 | 3.74 | 35.55 | 3.83 |
| | MCP | 34.77 | 4.05 | 34.83 | 3.87 | 35.02 | 3.77 | 35.54 | 4.09 | 34.80 | 3.90 | 34.60 | 3.95 | 35.88 | 3.87 | 34.55 | 3.71 | 34.70 | 3.78 | 35.62 | 3.88 |
| | XGBoost | 1.20 | 0.62 | 1.45 | 0.58 | 1.94 | 0.93 | 2.79 | 2.75 | 1.19 | 0.63 | 1.39 | 0.81 | 2.38 | 1.67 | 1.31 | 0.68 | 1.58 | 0.93 | 2.38 | 2.31 |
| | RF | 30.43 | 2.48 | 31.36 | 2.45 | 25.82 | 2.40 | 12.51 | 1.40 | 30.99 | 2.50 | 28.96 | 2.45 | 12.74 | 1.55 | 31.58 | 2.59 | 25.90 | 2.14 | 12.03 | 1.13 |
| | SVM | 7.63 | 1.64 | 7.31 | 1.26 | 8.01 | 1.73 | 23.11 | 6.48 | 7.38 | 1.43 | 6.81 | 1.61 | 7.04 | 1.42 | 8.08 | 1.85 | 8.26 | 2.11 | 16.28 | 5.51 |

Table 6: Mean and standard deviation of the training MSE for the linear simulations when $n = 200$ and $p = 2000$. See Figure 6 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 16.61 | 3.14 | 13.28 | 2.76 | 9.46 | 1.17 | 2.92 | 0.32 | 15.89 | 2.50 | 14.25 | 2.38 | 4.81 | 1.02 | 12.87 | 3.13 | 7.68 | 1.43 | 2.55 | 0.27 |
| | Lasso | 1.27 | 0.14 | 1.21 | 0.18 | 1.19 | 0.16 | 1.16 | 0.16 | 1.27 | 0.16 | 1.29 | 0.21 | 1.86 | 0.22 | 1.25 | 0.19 | 1.25 | 0.19 | 1.22 | 0.29 |
| | E-net | 1.30 | 0.15 | 1.22 | 0.19 | 1.20 | 0.17 | 1.17 | 0.16 | 1.30 | 0.17 | 1.32 | 0.22 | 1.88 | 0.23 | 1.28 | 0.21 | 1.26 | 0.20 | 1.23 | 0.29 |
| | SCAD | 0.90 | 0.14 | 0.92 | 0.14 | 0.98 | 0.11 | 1.11 | 0.25 | 0.91 | 0.14 | 0.90 | 0.16 | 1.21 | 0.34 | 0.90 | 0.13 | 0.96 | 0.14 | 1.13 | 0.28 |
| | MCP | 0.96 | 0.11 | 0.96 | 0.12 | 0.98 | 0.11 | 1.03 | 0.13 | 0.94 | 0.12 | 0.93 | 0.14 | 1.09 | 0.31 | 0.94 | 0.13 | 0.96 | 0.13 | 1.04 | 0.19 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| | RF | 1.14 | 0.10 | 1.15 | 0.11 | 0.89 | 0.09 | 0.38 | 0.04 | 1.17 | 0.11 | 0.96 | 0.09 | 0.37 | 0.04 | 1.10 | 0.11 | 0.81 | 0.08 | 0.35 | 0.03 |
| | SVM | 0.86 | 1.33 | 0.65 | 0.68 | 0.57 | 0.51 | 0.83 | 0.34 | 0.85 | 1.21 | 0.74 | 1.02 | 0.28 | 0.08 | 0.52 | 0.31 | 0.30 | 0.08 | 0.16 | 0.03 |
| 3 | Ridge | 149.45 | 28.28 | 122.74 | 21.78 | 86.14 | 10.91 | 26.16 | 3.00 | 144.11 | 22.82 | 126.59 | 22.42 | 44.09 | 9.15 | 115.88 | 26.48 | 69.61 | 14.02 | 23.39 | 2.88 |
| | Lasso | 11.44 | 1.26 | 11.01 | 1.49 | 10.50 | 1.52 | 10.35 | 1.37 | 11.44 | 1.51 | 11.58 | 1.72 | 16.67 | 2.00 | 11.40 | 1.43 | 11.26 | 1.63 | 10.90 | 2.44 |
| | E-net | 11.72 | 1.39 | 11.11 | 1.58 | 10.55 | 1.62 | 10.42 | 1.36 | 11.72 | 1.62 | 11.84 | 1.87 | 16.86 | 2.05 | 11.62 | 1.59 | 11.34 | 1.71 | 11.05 | 2.39 |
| | SCAD | 8.10 | 1.28 | 8.30 | 1.15 | 8.77 | 0.89 | 10.07 | 2.21 | 8.21 | 1.34 | 7.96 | 1.28 | 10.83 | 3.09 | 8.11 | 1.23 | 8.62 | 1.13 | 10.28 | 2.67 |
| | MCP | 8.61 | 1.03 | 8.59 | 1.04 | 8.80 | 0.98 | 9.39 | 1.38 | 8.53 | 1.11 | 8.43 | 1.12 | 9.75 | 2.61 | 8.46 | 1.08 | 8.67 | 1.08 | 9.72 | 2.14 |
| | XGBoost | 0.00 | 0.00 | 0.01 | 0.00 | 0.02 | 0.01 | 0.15 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.01 | 0.01 | 0.08 | 0.05 |
| | RF | 10.28 | 0.89 | 10.37 | 0.75 | 7.95 | 0.78 | 3.41 | 0.37 | 10.50 | 1.02 | 8.63 | 0.82 | 3.26 | 0.39 | 9.91 | 0.86 | 7.32 | 0.69 | 3.18 | 0.33 |
| | SVM | 7.86 | 11.99 | 6.38 | 8.36 | 5.20 | 4.55 | 6.66 | 2.53 | 8.28 | 12.54 | 6.05 | 8.98 | 2.56 | 0.79 | 5.02 | 5.23 | 2.90 | 0.81 | 1.48 | 0.74 |
| 6 | Ridge | 597.82 | 113.12 | 490.95 | 87.14 | 344.57 | 43.64 | 104.64 | 12.00 | 575.16 | 92.27 | 506.35 | 89.69 | 176.35 | 36.62 | 463.51 | 105.92 | 278.45 | 56.06 | 93.58 | 11.53 |
| | Lasso | 45.78 | 5.06 | 44.03 | 5.95 | 41.98 | 6.08 | 41.41 | 5.47 | 45.44 | 6.21 | 46.33 | 6.89 | 66.69 | 8.00 | 45.62 | 5.73 | 45.04 | 6.51 | 43.60 | 9.75 |
| | E-net | 46.87 | 5.56 | 44.46 | 6.33 | 42.20 | 6.48 | 41.69 | 5.45 | 46.52 | 6.79 | 47.35 | 7.47 | 67.43 | 8.21 | 46.47 | 6.37 | 45.38 | 6.83 | 44.21 | 9.57 |
| | SCAD | 32.40 | 5.12 | 33.21 | 4.61 | 35.10 | 3.55 | 40.28 | 8.85 | 32.60 | 5.25 | 31.86 | 5.12 | 43.32 | 12.36 | 32.43 | 4.94 | 34.46 | 4.50 | 41.14 | 10.68 |
| | MCP | 34.43 | 4.11 | 34.34 | 4.14 | 35.21 | 3.91 | 37.57 | 5.51 | 33.95 | 4.51 | 33.71 | 4.48 | 39.01 | 10.46 | 33.82 | 4.31 | 34.66 | 4.34 | 38.88 | 8.54 |
| | XGBoost | 0.02 | 0.01 | 0.03 | 0.01 | 0.08 | 0.04 | 0.63 | 0.57 | 0.02 | 0.01 | 0.02 | 0.01 | 0.03 | 0.02 | 0.02 | 0.01 | 0.04 | 0.03 | 0.29 | 0.22 |
| | RF | 41.06 | 3.58 | 41.51 | 2.98 | 31.84 | 3.14 | 13.67 | 1.50 | 41.88 | 3.81 | 34.50 | 3.22 | 13.03 | 1.55 | 39.62 | 3.47 | 29.28 | 2.76 | 12.71 | 1.31 |
| | SVM | 31.78 | 48.08 | 25.20 | 33.41 | 21.21 | 18.47 | 27.38 | 10.80 | 26.42 | 25.49 | 27.93 | 47.38 | 10.23 | 3.16 | 18.08 | 6.67 | 11.61 | 3.26 | 5.92 | 2.97 |

Table 7: Mean and standard deviation of the training MSE for the linear simulations when $n = 1000$ and $p = 10$. See Figure 7 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 |
| | AIC B | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | BIC B | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | AIC SB | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 0.99 | 0.04 | 0.99 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | BIC SB | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | AIC F | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | BIC F | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | AIC SF | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | BIC SF | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | Ridge | 1.11 | 0.05 | 1.13 | 0.05 | 1.19 | 0.05 | 1.41 | 0.05 | 1.13 | 0.05 | 1.18 | 0.05 | 1.38 | 0.05 | 1.12 | 0.05 | 1.18 | 0.05 | 1.39 | 0.05 |
| | Lasso | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 |
| | E-net | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 | 1.04 | 0.05 |
| | SCAD | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | MCP | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 | 1.00 | 0.04 |
| | XGBoost | 0.74 | 0.04 | 0.74 | 0.03 | 0.74 | 0.04 | 0.73 | 0.21 | 0.73 | 0.04 | 0.74 | 0.03 | 0.77 | 0.08 | 0.73 | 0.04 | 0.74 | 0.03 | 0.79 | 0.03 |
| | RF | 0.35 | 0.01 | 0.35 | 0.01 | 0.33 | 0.01 | 0.24 | 0.01 | 0.35 | 0.01 | 0.37 | 0.01 | 0.28 | 0.01 | 0.35 | 0.01 | 0.37 | 0.02 | 0.29 | 0.01 |
| | SVM | 0.45 | 0.03 | 0.49 | 0.04 | 0.68 | 0.11 | 0.91 | 0.05 | 0.47 | 0.03 | 0.58 | 0.10 | 0.85 | 0.06 | 0.48 | 0.03 | 0.63 | 0.10 | 0.85 | 0.06 |
| 3 | OLS | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 | 8.93 | 0.39 |
| | AIC B | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 |
| | BIC B | 8.99 | 0.40 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.98 | 0.39 | 8.98 | 0.39 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 |
| | AIC SB | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 |
| | BIC SB | 8.99 | 0.40 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.98 | 0.39 | 8.98 | 0.39 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 |
| | AIC F | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 |
| | BIC F | 8.99 | 0.40 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.98 | 0.39 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 |
| | AIC SF | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 | 8.96 | 0.39 |
| | BIC SF | 8.99 | 0.40 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.98 | 0.39 | 8.98 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 | 8.99 | 0.39 |
| | Ridge | 9.97 | 0.43 | 10.14 | 0.42 | 10.76 | 0.45 | 12.74 | 0.51 | 10.14 | 0.42 | 10.66 | 0.43 | 12.39 | 0.52 | 10.13 | 0.42 | 10.65 | 0.44 | 12.49 | 0.50 |
| | Lasso | 9.39 | 0.42 | 9.39 | 0.42 | 9.38 | 0.42 | 9.38 | 0.42 | 9.38 | 0.41 | 9.38 | 0.41 | 9.36 | 0.42 | 9.38 | 0.41 | 9.38 | 0.41 | 9.36 | 0.42 |
| | E-net | 9.39 | 0.42 | 9.39 | 0.42 | 9.38 | 0.42 | 9.38 | 0.42 | 9.38 | 0.42 | 9.39 | 0.41 | 9.36 | 0.42 | 9.39 | 0.41 | 9.38 | 0.42 | 9.36 | 0.41 |
| | SCAD | 8.98 | 0.39 | 8.97 | 0.39 | 8.97 | 0.39 | 8.97 | 0.39 | 8.97 | 0.39 | 8.97 | 0.40 | 8.97 | 0.39 | 8.98 | 0.39 | 8.98 | 0.40 | 8.97 | 0.39 |
| | MCP | 8.98 | 0.39 | 8.97 | 0.39 | 8.97 | 0.39 | 8.97 | 0.39 | 8.97 | 0.39 | 8.97 | 0.40 | 8.97 | 0.39 | 8.98 | 0.39 | 8.98 | 0.40 | 8.98 | 0.39 |
| | XGBoost | 6.62 | 0.33 | 6.64 | 0.33 | 6.64 | 0.30 | 6.28 | 2.18 | 6.64 | 0.35 | 6.63 | 0.32 | 6.51 | 1.88 | 6.64 | 0.31 | 6.65 | 0.33 | 7.06 | 0.34 |
| | RF | 3.14 | 0.12 | 3.20 | 0.12 | 3.00 | 0.12 | 2.14 | 0.10 | 3.18 | 0.13 | 3.35 | 0.13 | 2.50 | 0.11 | 3.17 | 0.14 | 3.37 | 0.14 | 2.64 | 0.12 |
| | SVM | 4.04 | 0.26 | 4.45 | 0.42 | 5.95 | 0.80 | 8.19 | 0.43 | 4.19 | 0.27 | 5.15 | 0.78 | 7.66 | 0.54 | 4.32 | 0.35 | 5.68 | 0.87 | 7.66 | 0.46 |
| 6 | OLS | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 | 35.73 | 1.56 |
| | AIC B | 35.83 | 1.56 | 35.83 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.83 | 1.57 | 35.82 | 1.56 | 35.83 | 1.57 |
| | BIC B | 35.95 | 1.60 | 35.93 | 1.58 | 35.94 | 1.56 | 35.95 | 1.58 | 35.94 | 1.57 | 35.93 | 1.56 | 35.93 | 1.57 | 35.95 | 1.57 | 35.95 | 1.57 | 35.94 | 1.57 |
| | AIC SB | 35.83 | 1.56 | 35.83 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.82 | 1.56 | 35.83 | 1.57 | 35.82 | 1.56 | 35.83 | 1.57 |
| | BIC SB | 35.95 | 1.60 | 35.93 | 1.58 | 35.94 | 1.56 | 35.95 | 1.58 | 35.94 | 1.57 | 35.93 | 1.56 | 35.93 | 1.57 | 35.95 | 1.57 | 35.95 | 1.57 | 35.94 | 1.57 |
| | AIC F | 35.83 | 1.56 | 35.83 | 1.56 | 35.83 | 1.56 | 35.82 | 1.56 | 35.83 | 1.56 | 35.84 | 1.56 | 35.85 | 1.56 | 35.83 | 1.57 | 35.83 | 1.57 | 35.84 | 1.56 |
| | BIC F | 35.95 | 1.60 | 35.93 | 1.58 | 35.95 | 1.56 | 35.95 | 1.58 | 35.94 | 1.57 | 35.93 | 1.56 | 35.94 | 1.58 | 35.95 | 1.57 | 35.95 | 1.57 | 35.94 | 1.57 |
| | AIC SF | 35.83 | 1.56 | 35.83 | 1.56 | 35.83 | 1.56 | 35.82 | 1.56 | 35.83 | 1.56 | 35.84 | 1.56 | 35.85 | 1.56 | 35.83 | 1.57 | 35.83 | 1.57 | 35.84 | 1.56 |
| | BIC SF | 35.95 | 1.60 | 35.93 | 1.58 | 35.95 | 1.56 | 35.95 | 1.58 | 35.94 | 1.57 | 35.93 | 1.56 | 35.94 | 1.58 | 35.95 | 1.57 | 35.95 | 1.57 | 35.94 | 1.57 |
| | Ridge | 39.89 | 1.73 | 40.57 | 1.68 | 43.03 | 1.79 | 50.97 | 2.04 | 40.54 | 1.69 | 42.64 | 1.72 | 49.55 | 2.09 | 40.53 | 1.68 | 42.61 | 1.74 | 49.95 | 2.01 |
| | Lasso | 37.57 | 1.67 | 37.54 | 1.66 | 37.53 | 1.67 | 37.53 | 1.68 | 37.51 | 1.66 | 37.54 | 1.65 | 37.45 | 1.66 | 37.54 | 1.65 | 37.52 | 1.65 | 37.44 | 1.67 |
| | E-net | 37.57 | 1.67 | 37.54 | 1.66 | 37.53 | 1.68 | 37.54 | 1.68 | 37.51 | 1.67 | 37.55 | 1.65 | 37.45 | 1.67 | 37.54 | 1.66 | 37.53 | 1.66 | 37.43 | 1.66 |
| | SCAD | 35.91 | 1.57 | 35.90 | 1.57 | 35.89 | 1.57 | 35.89 | 1.58 | 35.89 | 1.58 | 35.89 | 1.58 | 35.89 | 1.56 | 35.91 | 1.57 | 35.90 | 1.59 | 35.90 | 1.57 |
| | MCP | 35.91 | 1.56 | 35.89 | 1.56 | 35.90 | 1.58 | 35.89 | 1.58 | 35.89 | 1.57 | 35.89 | 1.59 | 35.88 | 1.56 | 35.91 | 1.57 | 35.90 | 1.59 | 35.90 | 1.57 |
| | XGBoost | 26.48 | 1.34 | 26.56 | 1.33 | 26.55 | 1.21 | 25.45 | 8.34 | 26.56 | 1.38 | 26.50 | 1.36 | 26.82 | 6.10 | 26.56 | 1.24 | 26.59 | 1.33 | 27.96 | 3.00 |
| | RF | 12.54 | 0.50 | 12.80 | 0.47 | 12.01 | 0.50 | 8.54 | 0.41 | 12.73 | 0.54 | 13.41 | 0.53 | 10.02 | 0.44 | 12.69 | 0.55 | 13.49 | 0.55 | 10.55 | 0.48 |
| | SVM | 16.16 | 1.04 | 17.81 | 1.68 | 23.79 | 3.20 | 32.74 | 1.72 | 16.77 | 1.06 | 20.59 | 3.10 | 30.65 | 2.15 | 17.29 | 1.38 | 22.72 | 3.48 | 30.66 | 1.84 |

Table 8: Mean and standard deviation of the training MSE for the linear simulations when $n = 1000$ and $p = 100$. See Figure 8 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 | 0.90 | 0.05 |
| | AIC F | 0.94 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.95 | 0.05 | 0.96 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.96 | 0.05 |
| | BIC F | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 1.00 | 0.05 |
| | AIC SF | 0.94 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.95 | 0.05 | 0.96 | 0.05 | 0.94 | 0.05 | 0.94 | 0.05 | 0.96 | 0.05 |
| | BIC SF | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 1.00 | 0.05 |
| | Ridge | 1.02 | 0.05 | 1.05 | 0.05 | 1.12 | 0.05 | 1.37 | 0.07 | 1.04 | 0.05 | 1.09 | 0.06 | 1.30 | 0.06 | 1.04 | 0.05 | 1.12 | 0.06 | 1.35 | 0.06 |
| | Lasso | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.04 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.04 | 0.05 |
| | E-net | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.04 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.04 | 0.05 |
| | SCAD | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 1.00 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 |
| | MCP | 0.99 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 1.00 | 0.05 | 1.00 | 0.05 | 1.00 | 0.05 | 0.99 | 0.05 | 0.99 | 0.05 | 1.00 | 0.05 | 0.99 | 0.05 |
| | XGBoost | 0.51 | 0.03 | 0.52 | 0.03 | 0.56 | 0.03 | 0.58 | 0.26 | 0.51 | 0.03 | 0.53 | 0.03 | 0.48 | 0.29 | 0.52 | 0.03 | 0.55 | 0.03 | 0.42 | 0.33 |
| | RF | 0.43 | 0.02 | 0.45 | 0.02 | 0.41 | 0.02 | 0.25 | 0.01 | 0.44 | 0.02 | 0.46 | 0.02 | 0.28 | 0.01 | 0.44 | 0.02 | 0.40 | 0.02 | 0.25 | 0.01 |
| | SVM | 0.15 | 0.01 | 0.15 | 0.01 | 0.15 | 0.01 | 0.65 | 0.04 | 0.15 | 0.01 | 0.13 | 0.01 | 0.19 | 0.01 | 0.15 | 0.01 | 0.15 | 0.01 | 0.42 | 0.03 |
| 3 | OLS | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 | 8.11 | 0.41 |
| | AIC F | 8.47 | 0.43 | 8.48 | 0.43 | 8.47 | 0.43 | 8.47 | 0.44 | 8.47 | 0.44 | 8.52 | 0.45 | 8.69 | 0.46 | 8.47 | 0.43 | 8.51 | 0.43 | 8.66 | 0.45 |
| | BIC F | 8.91 | 0.45 | 8.93 | 0.44 | 8.92 | 0.44 | 8.92 | 0.43 | 8.91 | 0.45 | 8.93 | 0.44 | 8.95 | 0.43 | 8.90 | 0.43 | 8.93 | 0.44 | 8.95 | 0.43 |
| | AIC SF | 8.47 | 0.43 | 8.48 | 0.42 | 8.47 | 0.43 | 8.47 | 0.44 | 8.47 | 0.44 | 8.52 | 0.45 | 8.69 | 0.47 | 8.47 | 0.43 | 8.52 | 0.43 | 8.66 | 0.45 |
| | BIC SF | 8.91 | 0.45 | 8.93 | 0.44 | 8.92 | 0.44 | 8.92 | 0.43 | 8.91 | 0.45 | 8.93 | 0.44 | 8.95 | 0.43 | 8.91 | 0.43 | 8.93 | 0.44 | 8.95 | 0.43 |
| | Ridge | 9.16 | 0.48 | 9.39 | 0.46 | 10.09 | 0.44 | 12.30 | 0.62 | 9.34 | 0.47 | 9.88 | 0.51 | 11.73 | 0.55 | 9.38 | 0.44 | 10.03 | 0.48 | 12.16 | 0.55 |
| | Lasso | 9.44 | 0.47 | 9.44 | 0.47 | 9.43 | 0.48 | 9.40 | 0.48 | 9.45 | 0.48 | 9.47 | 0.48 | 9.42 | 0.49 | 9.44 | 0.48 | 9.43 | 0.48 | 9.39 | 0.48 |
| | E-net | 9.45 | 0.48 | 9.46 | 0.47 | 9.43 | 0.48 | 9.40 | 0.48 | 9.46 | 0.49 | 9.49 | 0.48 | 9.43 | 0.49 | 9.45 | 0.48 | 9.45 | 0.48 | 9.40 | 0.47 |
| | SCAD | 8.94 | 0.45 | 8.95 | 0.44 | 8.96 | 0.44 | 8.97 | 0.43 | 8.94 | 0.45 | 8.95 | 0.43 | 8.93 | 0.43 | 8.94 | 0.44 | 8.95 | 0.44 | 8.94 | 0.44 |
| | MCP | 8.95 | 0.44 | 8.96 | 0.44 | 8.96 | 0.44 | 8.97 | 0.43 | 8.96 | 0.44 | 8.96 | 0.43 | 8.94 | 0.43 | 8.95 | 0.45 | 8.95 | 0.44 | 8.95 | 0.44 |
| | XGBoost | 4.60 | 0.23 | 4.72 | 0.28 | 5.08 | 0.27 | 5.27 | 2.33 | 4.64 | 0.27 | 4.80 | 0.25 | 4.35 | 2.60 | 4.69 | 0.26 | 4.93 | 0.27 | 4.18 | 2.88 |
| | RF | 3.89 | 0.16 | 4.00 | 0.15 | 3.69 | 0.15 | 2.26 | 0.10 | 3.95 | 0.18 | 4.17 | 0.17 | 2.55 | 0.12 | 3.96 | 0.15 | 3.63 | 0.13 | 2.23 | 0.09 |
| | SVM | 1.39 | 0.06 | 1.35 | 0.06 | 1.34 | 0.11 | 5.84 | 0.41 | 1.32 | 0.06 | 1.20 | 0.05 | 1.67 | 0.13 | 1.34 | 0.07 | 1.30 | 0.08 | 3.75 | 0.30 |
| 6 | OLS | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 | 32.45 | 1.66 |
| | AIC F | 33.87 | 1.72 | 33.91 | 1.70 | 33.87 | 1.73 | 33.86 | 1.75 | 33.89 | 1.76 | 34.07 | 1.79 | 34.75 | 1.86 | 33.88 | 1.74 | 34.05 | 1.70 | 34.65 | 1.82 |
| | BIC F | 35.65 | 1.79 | 35.71 | 1.75 | 35.67 | 1.76 | 35.70 | 1.74 | 35.65 | 1.79 | 35.72 | 1.74 | 35.80 | 1.72 | 35.62 | 1.74 | 35.71 | 1.78 | 35.81 | 1.74 |
| | AIC SF | 33.87 | 1.72 | 33.92 | 1.70 | 33.88 | 1.74 | 33.87 | 1.75 | 33.89 | 1.76 | 34.09 | 1.79 | 34.75 | 1.86 | 33.89 | 1.74 | 34.06 | 1.70 | 34.66 | 1.81 |
| | BIC SF | 35.65 | 1.79 | 35.71 | 1.75 | 35.67 | 1.76 | 35.70 | 1.74 | 35.65 | 1.79 | 35.72 | 1.74 | 35.80 | 1.72 | 35.62 | 1.74 | 35.71 | 1.78 | 35.81 | 1.74 |
| | Ridge | 36.64 | 1.91 | 37.58 | 1.84 | 40.37 | 1.78 | 49.19 | 2.46 | 37.36 | 1.87 | 39.50 | 2.02 | 46.91 | 2.21 | 37.51 | 1.76 | 40.12 | 1.92 | 48.65 | 2.20 |
| | Lasso | 37.74 | 1.90 | 37.75 | 1.88 | 37.72 | 1.90 | 37.60 | 1.91 | 37.79 | 1.93 | 37.89 | 1.91 | 37.70 | 1.96 | 37.74 | 1.91 | 37.74 | 1.90 | 37.56 | 1.90 |
| | E-net | 37.82 | 1.92 | 37.82 | 1.88 | 37.74 | 1.92 | 37.60 | 1.92 | 37.85 | 1.95 | 37.96 | 1.93 | 37.70 | 1.97 | 37.79 | 1.93 | 37.79 | 1.91 | 37.60 | 1.90 |
| | SCAD | 35.76 | 1.80 | 35.79 | 1.77 | 35.83 | 1.75 | 35.88 | 1.71 | 35.76 | 1.80 | 35.81 | 1.73 | 35.73 | 1.72 | 35.78 | 1.77 | 35.79 | 1.77 | 35.78 | 1.74 |
| | MCP | 35.80 | 1.77 | 35.83 | 1.76 | 35.84 | 1.76 | 35.88 | 1.72 | 35.82 | 1.76 | 35.85 | 1.70 | 35.76 | 1.72 | 35.79 | 1.78 | 35.82 | 1.76 | 35.80 | 1.76 |
| | XGBoost | 18.39 | 0.92 | 18.87 | 1.10 | 20.32 | 1.10 | 21.07 | 9.31 | 18.54 | 1.08 | 19.18 | 0.99 | 18.46 | 9.67 | 18.76 | 1.03 | 19.70 | 1.07 | 16.19 | 11.69 |
| | RF | 15.56 | 0.64 | 15.98 | 0.59 | 14.74 | 0.58 | 9.03 | 0.41 | 15.81 | 0.73 | 16.68 | 0.70 | 10.18 | 0.48 | 15.84 | 0.60 | 14.51 | 0.53 | 8.91 | 0.37 |
| | SVM | 5.57 | 0.25 | 5.41 | 0.24 | 5.37 | 0.43 | 23.34 | 1.62 | 5.29 | 0.24 | 4.80 | 0.22 | 6.67 | 0.53 | 5.37 | 0.27 | 5.19 | 0.33 | 14.98 | 1.21 |

Table 9: Mean and standard deviation of the training MSE for the linear simulations when $n = 1000$ and $p = 2000$. See Figure 9 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 11.51 | 0.94 | 10.43 | 0.76 | 8.23 | 0.62 | 2.79 | 0.13 | 11.24 | 0.97 | 9.91 | 0.70 | 5.40 | 0.23 | 10.43 | 0.65 | 7.92 | 0.45 | 2.76 | 0.14 |
| | Lasso | 1.07 | 0.05 | 1.07 | 0.06 | 1.06 | 0.06 | 1.07 | 0.05 | 1.07 | 0.06 | 1.08 | 0.06 | 1.10 | 0.07 | 1.07 | 0.05 | 1.08 | 0.06 | 1.07 | 0.06 |
| | E-net | 1.08 | 0.06 | 1.07 | 0.06 | 1.06 | 0.06 | 1.07 | 0.05 | 1.08 | 0.06 | 1.09 | 0.06 | 1.10 | 0.07 | 1.08 | 0.05 | 1.08 | 0.06 | 1.07 | 0.06 |
| | SCAD | 1.00 | 0.05 | 1.00 | 0.05 | 1.01 | 0.05 | 1.04 | 0.08 | 1.00 | 0.05 | 1.00 | 0.05 | 1.05 | 0.09 | 1.00 | 0.05 | 1.01 | 0.05 | 1.03 | 0.05 |
| | MCP | 1.00 | 0.05 | 1.00 | 0.05 | 1.00 | 0.05 | 1.03 | 0.04 | 1.00 | 0.05 | 1.00 | 0.05 | 1.04 | 0.05 | 1.00 | 0.05 | 1.00 | 0.05 | 1.03 | 0.05 |
| | XGBoost | 0.24 | 0.01 | 0.27 | 0.01 | 0.33 | 0.02 | 0.45 | 0.21 | 0.25 | 0.01 | 0.27 | 0.01 | 0.01 | 0.06 | 0.26 | 0.01 | 0.31 | 0.02 | 0.02 | 0.09 |
| | RF | 0.54 | 0.02 | 0.56 | 0.02 | 0.50 | 0.02 | 0.28 | 0.01 | 0.54 | 0.02 | 0.57 | 0.02 | 0.28 | 0.01 | 0.55 | 0.02 | 0.50 | 0.02 | 0.27 | 0.01 |
| | SVM | 0.42 | 0.05 | 0.38 | 0.06 | 0.36 | 0.05 | 0.67 | 0.08 | 0.39 | 0.05 | 0.34 | 0.04 | 0.15 | 0.01 | 0.37 | 0.05 | 0.29 | 0.03 | 1.02 | 0.32 |
| 3 | Ridge | 103.60 | 8.48 | 94.37 | 6.77 | 74.04 | 4.85 | 24.97 | 1.21 | 101.17 | 8.14 | 89.35 | 6.30 | 48.73 | 2.19 | 92.71 | 6.31 | 71.54 | 4.28 | 24.75 | 1.25 |
| | Lasso | 9.66 | 0.49 | 9.62 | 0.50 | 9.54 | 0.51 | 9.64 | 0.47 | 9.65 | 0.50 | 9.73 | 0.51 | 9.94 | 0.62 | 9.65 | 0.51 | 9.68 | 0.49 | 9.61 | 0.50 |
| | E-net | 9.72 | 0.50 | 9.65 | 0.51 | 9.54 | 0.51 | 9.69 | 0.47 | 9.72 | 0.52 | 9.80 | 0.53 | 9.97 | 0.63 | 9.70 | 0.51 | 9.72 | 0.51 | 9.66 | 0.49 |
| | SCAD | 8.98 | 0.41 | 8.99 | 0.40 | 9.11 | 0.42 | 9.45 | 1.10 | 8.99 | 0.41 | 9.03 | 0.41 | 9.43 | 0.85 | 8.99 | 0.41 | 9.11 | 0.42 | 9.32 | 0.77 |
| | MCP | 8.97 | 0.41 | 8.97 | 0.40 | 8.97 | 0.41 | 9.26 | 0.41 | 8.97 | 0.41 | 8.97 | 0.41 | 9.33 | 0.42 | 8.96 | 0.41 | 8.97 | 0.41 | 9.26 | 0.42 |
| | XGBoost | 2.18 | 0.12 | 2.38 | 0.11 | 3.00 | 0.15 | 4.08 | 1.93 | 2.22 | 0.12 | 2.39 | 0.12 | 0.09 | 0.52 | 2.30 | 0.13 | 2.71 | 0.29 | 0.04 | 0.39 |
| | RF | 4.82 | 0.17 | 5.07 | 0.20 | 4.49 | 0.18 | 2.48 | 0.10 | 4.87 | 0.18 | 5.12 | 0.19 | 2.56 | 0.13 | 4.94 | 0.19 | 4.45 | 0.15 | 2.37 | 0.10 |
| | SVM | 3.81 | 0.46 | 3.48 | 0.42 | 3.19 | 0.37 | 6.00 | 0.63 | 3.56 | 0.45 | 3.05 | 0.39 | 1.35 | 0.12 | 3.22 | 0.41 | 2.52 | 0.25 | 9.13 | 2.88 |
| 6 | Ridge | 414.41 | 33.94 | 377.48 | 27.07 | 296.15 | 19.39 | 99.88 | 4.83 | 405.48 | 31.22 | 357.42 | 25.20 | 194.92 | 8.77 | 370.85 | 25.25 | 286.16 | 17.10 | 99.00 | 5.00 |
| | Lasso | 38.62 | 1.97 | 38.46 | 1.99 | 38.17 | 2.03 | 38.57 | 1.87 | 38.65 | 2.04 | 38.92 | 2.05 | 39.75 | 2.47 | 38.60 | 2.02 | 38.72 | 1.97 | 38.46 | 1.98 |
| | E-net | 38.87 | 1.99 | 38.61 | 2.03 | 38.18 | 2.03 | 38.75 | 1.88 | 38.88 | 2.06 | 39.21 | 2.11 | 39.90 | 2.53 | 38.82 | 2.06 | 38.90 | 2.04 | 38.62 | 1.98 |
| | SCAD | 35.93 | 1.63 | 35.97 | 1.62 | 36.45 | 1.69 | 37.79 | 4.40 | 35.96 | 1.62 | 36.12 | 1.65 | 37.74 | 3.42 | 35.95 | 1.62 | 36.45 | 1.66 | 37.29 | 3.08 |
| | MCP | 35.86 | 1.63 | 35.86 | 1.62 | 35.89 | 1.62 | 37.05 | 1.63 | 35.86 | 1.63 | 35.88 | 1.64 | 37.33 | 1.69 | 35.85 | 1.62 | 35.88 | 1.63 | 37.04 | 1.67 |
| | XGBoost | 8.71 | 0.46 | 9.53 | 0.44 | 12.01 | 0.59 | 16.90 | 7.19 | 8.91 | 0.46 | 9.54 | 0.48 | 0.25 | 1.75 | 9.20 | 0.51 | 10.92 | 0.55 | 0.00 | 0.00 |
| | RF | 19.27 | 0.69 | 20.27 | 0.82 | 17.96 | 0.70 | 9.93 | 0.40 | 19.45 | 0.72 | 20.47 | 0.77 | 10.24 | 0.51 | 19.77 | 0.78 | 17.79 | 0.60 | 9.49 | 0.42 |
| | SVM | 15.24 | 1.86 | 13.92 | 1.68 | 12.77 | 1.48 | 24.00 | 2.51 | 14.25 | 1.81 | 12.18 | 1.56 | 5.39 | 0.47 | 12.89 | 1.63 | 10.07 | 1.00 | 36.55 | 11.75 |

## 4.2 Tables for the testing MSE of the linear simulations

Table 10: Mean and standard deviation of the testing MSE for the linear simulations when $n = 50$ and $p = 10$. See Figure 10 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 | 1.28 | 0.25 |
| | AIC B | 1.22 | 0.25 | 1.21 | 0.25 | 1.23 | 0.26 | 1.22 | 0.25 | 1.22 | 0.26 | 1.21 | 0.25 | 1.23 | 0.25 | 1.22 | 0.26 | 1.22 | 0.25 | 1.22 | 0.26 |
| | BIC B | 1.16 | 0.24 | 1.19 | 0.24 | 1.21 | 0.27 | 1.18 | 0.27 | 1.18 | 0.28 | 1.17 | 0.24 | 1.20 | 0.25 | 1.20 | 0.28 | 1.19 | 0.25 | 1.17 | 0.26 |
| | AIC SB | 1.22 | 0.25 | 1.21 | 0.25 | 1.23 | 0.26 | 1.22 | 0.25 | 1.22 | 0.26 | 1.21 | 0.25 | 1.23 | 0.25 | 1.22 | 0.26 | 1.22 | 0.25 | 1.22 | 0.26 |
| | BIC SB | 1.16 | 0.24 | 1.19 | 0.24 | 1.21 | 0.27 | 1.18 | 0.27 | 1.18 | 0.28 | 1.17 | 0.24 | 1.20 | 0.25 | 1.20 | 0.28 | 1.19 | 0.25 | 1.17 | 0.26 |
| | AIC F | 1.21 | 0.25 | 1.21 | 0.25 | 1.23 | 0.26 | 1.21 | 0.25 | 1.22 | 0.27 | 1.20 | 0.25 | 1.27 | 0.30 | 1.22 | 0.26 | 1.22 | 0.25 | 1.23 | 0.31 |
| | BIC F | 1.16 | 0.25 | 1.18 | 0.24 | 1.21 | 0.27 | 1.19 | 0.27 | 1.18 | 0.27 | 1.16 | 0.23 | 1.35 | 0.38 | 1.20 | 0.28 | 1.19 | 0.25 | 1.26 | 0.39 |
| | AIC SF | 1.21 | 0.25 | 1.21 | 0.25 | 1.23 | 0.26 | 1.21 | 0.25 | 1.22 | 0.27 | 1.20 | 0.25 | 1.27 | 0.30 | 1.22 | 0.26 | 1.22 | 0.25 | 1.23 | 0.31 |
| | BIC SF | 1.16 | 0.25 | 1.18 | 0.24 | 1.21 | 0.27 | 1.19 | 0.27 | 1.18 | 0.27 | 1.16 | 0.23 | 1.35 | 0.38 | 1.20 | 0.28 | 1.19 | 0.25 | 1.26 | 0.40 |
| | Ridge | 1.59 | 0.35 | 1.61 | 0.41 | 1.72 | 0.50 | 1.93 | 0.42 | 1.59 | 0.37 | 1.71 | 0.40 | 1.85 | 0.52 | 1.60 | 0.38 | 1.72 | 0.46 | 1.91 | 0.48 |
| | Lasso | 1.38 | 0.33 | 1.39 | 0.36 | 1.38 | 0.39 | 1.44 | 0.36 | 1.40 | 0.33 | 1.39 | 0.33 | 1.40 | 0.44 | 1.37 | 0.36 | 1.40 | 0.38 | 1.40 | 0.40 |
| | E-net | 1.38 | 0.33 | 1.40 | 0.36 | 1.39 | 0.39 | 1.44 | 0.35 | 1.40 | 0.33 | 1.40 | 0.32 | 1.41 | 0.44 | 1.38 | 0.37 | 1.41 | 0.39 | 1.41 | 0.40 |
| | SCAD | 1.20 | 0.24 | 1.20 | 0.26 | 1.21 | 0.26 | 1.22 | 0.31 | 1.20 | 0.26 | 1.19 | 0.24 | 1.20 | 0.27 | 1.21 | 0.27 | 1.20 | 0.26 | 1.17 | 0.25 |
| | MCP | 1.20 | 0.25 | 1.19 | 0.26 | 1.21 | 0.26 | 1.21 | 0.30 | 1.21 | 0.27 | 1.19 | 0.24 | 1.20 | 0.27 | 1.21 | 0.27 | 1.20 | 0.25 | 1.18 | 0.26 |
| | XGBoost | 3.77 | 1.23 | 3.73 | 1.04 | 3.68 | 1.07 | 2.84 | 0.77 | 3.68 | 0.97 | 3.80 | 1.14 | 2.95 | 0.73 | 3.86 | 1.08 | 3.74 | 1.17 | 2.86 | 0.73 |
| | RF | 6.90 | 1.76 | 6.50 | 1.66 | 5.17 | 1.34 | 2.66 | 0.65 | 6.78 | 1.75 | 5.80 | 1.32 | 2.78 | 0.63 | 6.73 | 1.53 | 5.85 | 1.47 | 2.91 | 0.66 |
| | SVM | 5.77 | 1.71 | 5.41 | 1.72 | 4.33 | 1.69 | 3.00 | 1.43 | 5.62 | 1.83 | 4.99 | 1.54 | 3.43 | 1.36 | 5.30 | 1.45 | 4.79 | 1.53 | 3.20 | 1.08 |
| 3 | OLS | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 | 11.48 | 2.26 |
| | AIC B | 10.96 | 2.24 | 10.99 | 2.37 | 10.96 | 2.30 | 10.96 | 2.27 | 10.91 | 2.30 | 11.16 | 2.49 | 11.09 | 2.28 | 10.97 | 2.25 | 11.05 | 2.39 | 11.10 | 2.29 |
| | BIC B | 10.47 | 2.19 | 10.56 | 2.33 | 10.81 | 2.45 | 10.68 | 2.26 | 10.59 | 2.36 | 10.95 | 2.43 | 10.76 | 2.19 | 10.62 | 2.30 | 10.92 | 2.39 | 10.69 | 2.15 |
| | AIC SB | 10.96 | 2.24 | 10.98 | 2.36 | 10.96 | 2.31 | 10.96 | 2.27 | 10.91 | 2.30 | 11.16 | 2.49 | 11.07 | 2.25 | 10.97 | 2.25 | 11.07 | 2.38 | 11.10 | 2.29 |
| | BIC SB | 10.47 | 2.19 | 10.56 | 2.33 | 10.81 | 2.45 | 10.68 | 2.26 | 10.59 | 2.36 | 10.92 | 2.42 | 10.76 | 2.19 | 10.62 | 2.30 | 10.92 | 2.39 | 10.70 | 2.17 |
| | AIC F | 10.88 | 2.22 | 10.92 | 2.34 | 10.94 | 2.31 | 10.90 | 2.26 | 10.83 | 2.34 | 11.07 | 2.45 | 11.15 | 2.63 | 10.88 | 2.24 | 11.00 | 2.33 | 11.00 | 2.31 |
| | BIC F | 10.43 | 2.27 | 10.49 | 2.25 | 10.75 | 2.47 | 10.81 | 2.63 | 10.61 | 2.35 | 10.90 | 2.41 | 12.52 | 3.69 | 10.62 | 2.30 | 10.82 | 2.31 | 11.17 | 2.98 |
| | AIC SF | 10.88 | 2.22 | 10.92 | 2.34 | 10.94 | 2.31 | 10.90 | 2.26 | 10.81 | 2.31 | 11.07 | 2.46 | 11.15 | 2.68 | 10.88 | 2.24 | 11.02 | 2.36 | 11.01 | 2.31 |
| | BIC SF | 10.43 | 2.27 | 10.49 | 2.25 | 10.73 | 2.44 | 10.81 | 2.63 | 10.61 | 2.35 | 10.90 | 2.41 | 12.52 | 3.69 | 10.62 | 2.30 | 10.81 | 2.30 | 11.17 | 2.98 |
| | Ridge | 14.28 | 3.13 | 14.76 | 3.73 | 15.83 | 4.41 | 16.52 | 3.86 | 14.53 | 3.95 | 15.46 | 3.63 | 16.69 | 4.26 | 14.76 | 3.81 | 15.83 | 3.86 | 16.58 | 4.47 |
| | Lasso | 12.45 | 2.93 | 12.43 | 2.98 | 12.60 | 3.77 | 12.33 | 3.19 | 12.80 | 3.49 | 12.88 | 3.21 | 12.48 | 3.71 | 12.67 | 3.50 | 12.74 | 3.02 | 12.63 | 3.64 |
| | E-net | 12.45 | 2.94 | 12.48 | 2.95 | 12.70 | 3.89 | 12.40 | 3.21 | 12.84 | 3.51 | 12.95 | 3.27 | 12.55 | 3.72 | 12.74 | 3.48 | 12.83 | 3.06 | 12.67 | 3.64 |
| | SCAD | 10.78 | 2.20 | 10.65 | 2.23 | 10.94 | 2.32 | 10.83 | 2.28 | 10.81 | 2.35 | 10.97 | 2.36 | 10.95 | 2.27 | 10.87 | 2.33 | 11.02 | 2.15 | 10.77 | 2.54 |
| | MCP | 10.78 | 2.26 | 10.79 | 2.28 | 10.95 | 2.39 | 10.80 | 2.32 | 10.81 | 2.39 | 10.98 | 2.35 | 10.95 | 2.29 | 10.83 | 2.33 | 11.04 | 2.16 | 10.79 | 2.58 |
| | XGBoost | 33.98 | 10.78 | 32.77 | 7.22 | 35.35 | 9.76 | 24.49 | 6.47 | 34.84 | 10.04 | 33.36 | 8.71 | 26.31 | 7.49 | 33.34 | 9.91 | 34.35 | 9.96 | 26.26 | 5.93 |
| | RF | 62.03 | 15.76 | 58.75 | 13.48 | 47.81 | 11.28 | 22.82 | 5.39 | 62.44 | 15.73 | 52.84 | 12.10 | 24.71 | 6.27 | 61.25 | 17.22 | 52.87 | 13.17 | 25.48 | 6.02 |
| | SVM | 51.93 | 15.39 | 49.28 | 14.49 | 39.69 | 13.86 | 26.89 | 13.84 | 49.16 | 15.22 | 45.65 | 13.83 | 29.18 | 11.98 | 49.59 | 15.44 | 41.73 | 14.36 | 29.15 | 11.83 |
| 6 | OLS | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 | 45.93 | 9.03 |
| | AIC B | 43.85 | 8.96 | 43.95 | 9.48 | 43.82 | 9.22 | 43.84 | 9.07 | 43.65 | 9.20 | 44.63 | 9.96 | 44.35 | 9.13 | 43.87 | 8.99 | 44.19 | 9.55 | 44.39 | 9.15 |
| | BIC B | 41.89 | 8.76 | 42.23 | 9.31 | 43.26 | 9.81 | 42.74 | 9.03 | 42.35 | 9.46 | 43.82 | 9.74 | 43.05 | 8.76 | 42.49 | 9.20 | 43.66 | 9.56 | 42.75 | 8.60 |
| | AIC SB | 43.85 | 8.96 | 43.93 | 9.44 | 43.83 | 9.23 | 43.84 | 9.07 | 43.65 | 9.20 | 44.63 | 9.96 | 44.29 | 9.00 | 43.87 | 8.99 | 44.27 | 9.50 | 44.39 | 9.15 |
| | BIC SB | 41.89 | 8.76 | 42.25 | 9.30 | 43.26 | 9.81 | 42.74 | 9.03 | 42.35 | 9.46 | 43.67 | 9.69 | 43.05 | 8.76 | 42.49 | 9.20 | 43.66 | 9.56 | 42.80 | 8.67 |
| | AIC F | 43.53 | 8.89 | 43.69 | 9.35 | 43.76 | 9.24 | 43.58 | 9.04 | 43.31 | 9.37 | 44.28 | 9.82 | 44.62 | 10.52 | 43.53 | 8.95 | 43.99 | 9.33 | 44.00 | 9.25 |
| | BIC F | 41.72 | 9.09 | 41.98 | 9.00 | 43.00 | 9.87 | 43.25 | 10.50 | 42.43 | 9.41 | 43.60 | 9.63 | 50.08 | 14.76 | 42.46 | 9.20 | 43.30 | 9.25 | 44.70 | 11.92 |
| | AIC SF | 43.53 | 8.89 | 43.69 | 9.35 | 43.76 | 9.24 | 43.58 | 9.04 | 43.26 | 9.24 | 44.29 | 9.83 | 44.59 | 10.71 | 43.53 | 8.95 | 44.09 | 9.42 | 44.03 | 9.23 |
| | BIC SF | 41.72 | 9.09 | 41.98 | 9.00 | 42.93 | 9.78 | 43.25 | 10.50 | 42.43 | 9.41 | 43.60 | 9.63 | 50.08 | 14.76 | 42.46 | 9.20 | 43.25 | 9.18 | 44.70 | 11.92 |
| | Ridge | 57.10 | 12.52 | 59.04 | 14.93 | 63.31 | 17.65 | 66.07 | 15.44 | 58.14 | 15.81 | 61.86 | 14.53 | 66.75 | 17.06 | 59.05 | 15.22 | 63.33 | 15.43 | 66.31 | 17.89 |
| | Lasso | 49.81 | 11.71 | 49.71 | 11.93 | 50.42 | 15.09 | 49.32 | 12.76 | 51.21 | 13.98 | 51.53 | 12.83 | 49.91 | 14.84 | 50.70 | 13.98 | 50.96 | 12.09 | 50.52 | 14.55 |
| | E-net | 49.78 | 11.75 | 49.91 | 11.82 | 50.79 | 15.58 | 49.60 | 12.82 | 51.38 | 14.04 | 51.78 | 13.08 | 50.20 | 14.89 | 50.95 | 13.91 | 51.30 | 12.26 | 50.70 | 14.58 |
| | SCAD | 43.13 | 8.80 | 42.60 | 8.91 | 43.78 | 9.28 | 43.31 | 9.13 | 43.26 | 9.40 | 43.88 | 9.43 | 43.79 | 9.06 | 43.49 | 9.32 | 44.06 | 8.60 | 43.07 | 10.14 |
| | MCP | 43.11 | 9.06 | 43.16 | 9.11 | 43.81 | 9.56 | 43.21 | 9.29 | 43.23 | 9.54 | 43.93 | 9.38 | 43.78 | 9.17 | 43.31 | 9.32 | 44.16 | 8.66 | 43.18 | 10.33 |
| | XGBoost | 135.14 | 42.27 | 130.40 | 31.97 | 140.36 | 39.19 | 98.96 | 27.35 | 139.77 | 39.97 | 135.79 | 36.04 | 106.84 | 29.00 | 137.05 | 43.08 | 137.13 | 40.92 | 105.88 | 25.90 |
| | RF | 248.10 | 63.21 | 234.96 | 53.56 | 191.50 | 45.02 | 91.31 | 21.77 | 249.60 | 63.00 | 211.29 | 48.38 | 98.71 | 24.80 | 245.15 | 68.82 | 211.40 | 52.49 | 101.87 | 24.11 |
| | SVM | 207.71 | 61.55 | 197.11 | 57.98 | 159.04 | 55.73 | 107.77 | 55.70 | 196.65 | 60.89 | 182.60 | 55.31 | 116.76 | 48.12 | 198.36 | 61.76 | 166.94 | 57.46 | 116.65 | 48.17 |

Table 11: Mean and standard deviation of the testing MSE for the linear simulations when $n = 50$ and $p = 100$. See Figure 11 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 18.51 | 3.90 | 15.63 | 3.59 | 10.83 | 2.32 | 3.43 | 0.87 | 17.49 | 3.48 | 14.57 | 2.86 | 7.83 | 1.69 | 16.27 | 3.51 | 11.94 | 2.74 | 4.71 | 0.94 |
| | Lasso | 1.92 | 0.65 | 1.89 | 0.62 | 1.77 | 0.46 | 1.87 | 0.57 | 2.02 | 0.74 | 2.06 | 0.68 | 2.16 | 0.66 | 1.82 | 0.53 | 1.92 | 0.71 | 1.83 | 0.50 |
| | E-net | 2.01 | 0.71 | 1.98 | 0.68 | 1.85 | 0.49 | 1.90 | 0.55 | 2.14 | 0.80 | 2.20 | 0.73 | 2.22 | 0.69 | 1.92 | 0.58 | 2.04 | 0.75 | 1.88 | 0.50 |
| | SCAD | 1.30 | 0.31 | 1.24 | 0.27 | 1.22 | 0.29 | 1.60 | 0.62 | 1.33 | 0.35 | 1.28 | 0.29 | 1.77 | 0.56 | 1.26 | 0.28 | 1.25 | 0.28 | 1.60 | 0.51 |
| | MCP | 1.29 | 0.31 | 1.23 | 0.27 | 1.23 | 0.27 | 1.58 | 0.62 | 1.33 | 0.35 | 1.28 | 0.30 | 1.77 | 0.51 | 1.26 | 0.29 | 1.28 | 0.32 | 1.55 | 0.52 |
| | XGBoost | 6.74 | 2.46 | 6.76 | 1.98 | 6.29 | 1.61 | 3.20 | 0.76 | 7.25 | 2.44 | 6.70 | 1.84 | 3.35 | 0.89 | 6.79 | 2.55 | 6.15 | 1.65 | 3.14 | 0.80 |
| | RF | 11.11 | 3.11 | 9.82 | 2.21 | 7.30 | 1.67 | 2.95 | 0.65 | 10.62 | 2.69 | 7.78 | 1.89 | 3.19 | 1.00 | 9.49 | 2.48 | 6.86 | 1.52 | 2.93 | 0.74 |
| | SVM | 15.26 | 3.20 | 12.86 | 2.73 | 9.14 | 1.97 | 3.84 | 1.37 | 14.69 | 2.89 | 11.91 | 2.28 | 6.32 | 1.63 | 13.25 | 3.00 | 9.85 | 2.05 | 5.32 | 1.63 |
| 3 | Ridge | 166.58 | 35.12 | 146.49 | 29.65 | 100.52 | 21.75 | 31.74 | 8.08 | 156.80 | 33.54 | 130.27 | 25.90 | 70.46 | 15.25 | 154.31 | 37.41 | 113.86 | 29.99 | 41.15 | 8.65 |
| | Lasso | 17.31 | 5.86 | 17.67 | 4.92 | 17.37 | 5.17 | 16.77 | 4.56 | 17.25 | 6.83 | 19.15 | 8.23 | 19.61 | 6.05 | 16.89 | 5.78 | 17.43 | 6.11 | 16.92 | 4.39 |
| | E-net | 18.12 | 6.35 | 18.58 | 5.17 | 18.34 | 5.48 | 17.22 | 4.76 | 18.31 | 8.02 | 20.67 | 9.37 | 20.14 | 6.39 | 17.95 | 6.23 | 18.54 | 6.80 | 17.39 | 4.40 |
| | SCAD | 11.72 | 2.76 | 11.51 | 2.70 | 11.18 | 2.59 | 14.86 | 5.24 | 11.49 | 2.57 | 11.56 | 2.63 | 16.15 | 5.04 | 11.62 | 2.85 | 11.04 | 2.23 | 14.61 | 5.16 |
| | MCP | 11.57 | 2.76 | 11.38 | 2.68 | 11.30 | 2.82 | 14.86 | 5.67 | 11.43 | 2.75 | 11.49 | 2.72 | 16.23 | 4.97 | 11.83 | 3.15 | 11.12 | 2.35 | 14.40 | 5.60 |
| | XGBoost | 60.79 | 22.15 | 61.23 | 19.91 | 59.02 | 16.41 | 30.04 | 7.65 | 64.66 | 22.84 | 58.64 | 17.35 | 29.40 | 8.20 | 65.29 | 24.72 | 54.70 | 14.36 | 30.14 | 7.51 |
| | RF | 99.91 | 28.06 | 90.95 | 21.92 | 67.66 | 14.67 | 27.40 | 6.60 | 94.63 | 25.22 | 68.99 | 16.25 | 28.45 | 8.93 | 91.36 | 24.31 | 65.25 | 16.79 | 27.45 | 6.03 |
| | SVM | 137.17 | 29.08 | 119.12 | 22.96 | 85.63 | 17.58 | 35.49 | 12.53 | 132.14 | 29.74 | 107.00 | 21.71 | 56.73 | 14.52 | 126.79 | 29.55 | 93.70 | 22.88 | 48.56 | 13.77 |
| 6 | Ridge | 666.34 | 140.48 | 585.98 | 118.58 | 402.09 | 86.99 | 126.97 | 32.31 | 627.21 | 134.14 | 521.08 | 103.61 | 281.85 | 61.00 | 617.24 | 149.63 | 455.45 | 119.98 | 164.62 | 34.62 |
| | Lasso | 69.24 | 23.45 | 70.66 | 19.70 | 69.49 | 20.69 | 67.07 | 18.26 | 69.00 | 27.33 | 76.61 | 32.91 | 78.42 | 24.21 | 67.58 | 23.12 | 69.74 | 24.45 | 67.66 | 17.57 |
| | E-net | 72.48 | 25.40 | 74.31 | 20.69 | 73.37 | 21.93 | 68.88 | 19.05 | 73.22 | 32.08 | 82.68 | 37.49 | 80.55 | 25.58 | 71.78 | 24.93 | 74.15 | 27.19 | 69.58 | 17.60 |
| | SCAD | 46.89 | 11.04 | 46.03 | 10.80 | 44.70 | 10.34 | 59.44 | 20.96 | 45.96 | 10.28 | 46.22 | 10.53 | 64.60 | 20.15 | 46.47 | 11.40 | 44.15 | 8.94 | 58.44 | 20.66 |
| | MCP | 46.29 | 11.03 | 45.51 | 10.72 | 45.18 | 11.30 | 59.44 | 22.66 | 45.73 | 11.00 | 45.95 | 10.89 | 64.93 | 19.89 | 47.33 | 12.59 | 44.50 | 9.39 | 57.58 | 22.39 |
| | XGBoost | 245.25 | 97.07 | 248.21 | 81.12 | 238.05 | 61.65 | 121.91 | 30.26 | 262.52 | 93.47 | 232.99 | 70.12 | 119.33 | 32.43 | 265.31 | 101.58 | 218.01 | 59.65 | 120.72 | 28.45 |
| | RF | 398.68 | 111.80 | 364.36 | 88.11 | 271.02 | 59.26 | 109.62 | 26.27 | 377.42 | 99.99 | 275.74 | 64.80 | 113.58 | 35.70 | 365.86 | 97.51 | 261.06 | 67.10 | 109.81 | 23.97 |
| | SVM | 549.06 | 116.25 | 476.33 | 90.43 | 342.46 | 70.89 | 141.92 | 50.27 | 528.25 | 118.21 | 428.04 | 86.09 | 227.35 | 59.29 | 506.23 | 118.23 | 373.93 | 91.39 | 193.51 | 54.17 |

Table 12: Mean and standard deviation of the testing MSE for the linear simulations when $n = 50$ and $p = 2000$. See Figure 12 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 18.26 | 4.09 | 16.45 | 3.62 | 11.07 | 2.61 | 3.24 | 0.83 | 17.70 | 3.71 | 15.45 | 2.64 | 12.86 | 2.74 | 17.19 | 3.53 | 15.28 | 3.46 | 5.26 | 1.64 |
| | Lasso | 3.93 | 2.62 | 4.29 | 3.55 | 4.05 | 2.20 | 2.56 | 0.74 | 5.04 | 3.76 | 6.20 | 2.28 | 2.68 | 0.74 | 5.38 | 3.74 | 5.67 | 2.40 | 2.26 | 0.57 |
| | E-net | 4.94 | 3.33 | 4.94 | 3.75 | 4.56 | 2.32 | 2.63 | 0.75 | 5.97 | 3.97 | 6.79 | 2.27 | 2.84 | 0.79 | 6.32 | 3.87 | 6.11 | 2.40 | 2.39 | 0.61 |
| | SCAD | 1.32 | 0.32 | 1.33 | 0.28 | 1.36 | 0.72 | 2.13 | 0.77 | 1.35 | 0.36 | 2.69 | 2.02 | 1.94 | 0.44 | 1.38 | 0.56 | 1.64 | 1.13 | 1.96 | 0.56 |
| | MCP | 1.31 | 0.27 | 1.33 | 0.29 | 1.47 | 0.92 | 2.01 | 0.73 | 1.49 | 1.42 | 3.11 | 2.11 | 1.94 | 0.42 | 1.41 | 0.56 | 2.14 | 2.22 | 2.00 | 0.50 |
| | XGBoost | 13.07 | 4.31 | 11.25 | 3.27 | 9.00 | 2.21 | 3.45 | 0.80 | 12.15 | 3.90 | 9.36 | 2.26 | 4.01 | 1.26 | 11.23 | 3.36 | 8.77 | 2.42 | 3.54 | 0.91 |
| | RF | 15.12 | 3.90 | 12.37 | 2.89 | 9.19 | 2.08 | 3.07 | 0.69 | 13.18 | 3.65 | 9.76 | 2.01 | 4.25 | 1.42 | 12.53 | 3.15 | 9.23 | 2.37 | 3.40 | 0.86 |
| | SVM | 18.21 | 4.09 | 15.34 | 3.07 | 10.81 | 2.45 | 4.04 | 1.54 | 17.59 | 3.69 | 15.31 | 2.66 | 12.28 | 2.62 | 16.72 | 3.48 | 14.30 | 3.21 | 7.52 | 1.74 |
| 3 | Ridge | 164.35 | 36.81 | 150.51 | 32.67 | 97.78 | 23.37 | 28.75 | 7.20 | 159.29 | 32.76 | 138.96 | 23.87 | 116.54 | 25.33 | 154.77 | 32.38 | 134.34 | 28.18 | 47.45 | 14.78 |
| | Lasso | 35.41 | 23.54 | 39.56 | 31.53 | 36.76 | 18.69 | 22.65 | 7.29 | 46.96 | 36.21 | 57.89 | 21.14 | 24.45 | 7.53 | 40.63 | 26.95 | 48.49 | 17.55 | 20.31 | 4.58 |
| | E-net | 44.50 | 29.99 | 45.86 | 33.20 | 41.16 | 19.31 | 23.33 | 7.02 | 55.23 | 39.39 | 62.92 | 22.16 | 25.84 | 7.87 | 49.11 | 28.88 | 52.55 | 17.53 | 21.39 | 4.62 |
| | SCAD | 11.87 | 2.86 | 11.83 | 3.01 | 11.76 | 4.85 | 18.98 | 7.47 | 12.02 | 3.26 | 23.02 | 17.75 | 17.31 | 3.32 | 12.46 | 6.68 | 14.02 | 9.41 | 18.62 | 4.86 |
| | MCP | 11.81 | 2.45 | 12.02 | 3.17 | 13.14 | 8.51 | 19.18 | 7.39 | 12.55 | 5.32 | 25.93 | 19.00 | 17.21 | 3.36 | 12.14 | 3.50 | 17.08 | 13.36 | 19.18 | 5.37 |
| | XGBoost | 117.95 | 37.64 | 101.44 | 28.63 | 79.55 | 18.57 | 30.29 | 7.55 | 109.00 | 30.53 | 81.55 | 18.59 | 37.71 | 12.68 | 98.03 | 23.80 | 77.15 | 20.33 | 31.76 | 7.92 |
| | RF | 135.80 | 34.62 | 112.34 | 27.49 | 81.23 | 15.94 | 27.61 | 6.93 | 119.64 | 31.55 | 87.90 | 20.24 | 38.83 | 13.27 | 112.97 | 29.21 | 79.94 | 20.82 | 30.55 | 7.88 |
| | SVM | 163.59 | 36.25 | 139.97 | 27.07 | 97.76 | 21.06 | 36.16 | 14.44 | 158.19 | 32.83 | 137.72 | 23.81 | 112.21 | 24.66 | 151.22 | 31.29 | 125.19 | 25.12 | 68.14 | 15.74 |
| 6 | Ridge | 657.41 | 147.23 | 602.03 | 130.67 | 391.11 | 93.49 | 114.98 | 28.81 | 635.49 | 129.34 | 555.83 | 95.49 | 466.18 | 101.34 | 619.07 | 129.52 | 537.36 | 112.74 | 189.79 | 59.14 |
| | Lasso | 141.66 | 94.14 | 158.24 | 126.14 | 147.04 | 74.76 | 90.58 | 29.17 | 191.58 | 142.86 | 231.54 | 84.58 | 97.80 | 30.12 | 162.51 | 107.79 | 193.95 | 70.18 | 81.23 | 18.30 |
| | E-net | 178.00 | 119.95 | 183.44 | 132.80 | 164.64 | 77.22 | 93.33 | 28.07 | 222.48 | 149.93 | 251.66 | 88.64 | 103.37 | 31.48 | 196.43 | 115.53 | 210.21 | 70.10 | 85.55 | 18.46 |
| | SCAD | 47.50 | 11.43 | 47.32 | 12.04 | 47.03 | 19.41 | 75.91 | 29.87 | 47.31 | 12.16 | 92.09 | 71.01 | 69.25 | 13.26 | 49.83 | 26.73 | 56.09 | 37.62 | 74.47 | 19.45 |
| | MCP | 47.24 | 9.79 | 48.09 | 12.66 | 52.55 | 34.03 | 76.73 | 29.56 | 52.76 | 45.99 | 103.71 | 76.00 | 68.85 | 13.43 | 48.56 | 14.01 | 68.31 | 53.44 | 76.72 | 21.48 |
| | XGBoost | 469.79 | 153.10 | 410.24 | 124.20 | 321.26 | 76.75 | 120.60 | 32.85 | 427.40 | 130.84 | 323.66 | 75.19 | 149.85 | 51.63 | 401.51 | 100.54 | 307.25 | 84.34 | 125.67 | 32.82 |
| | RF | 544.40 | 138.21 | 449.51 | 110.71 | 323.89 | 63.22 | 110.63 | 27.86 | 475.33 | 125.96 | 351.50 | 80.88 | 155.18 | 52.79 | 451.61 | 116.15 | 319.99 | 83.11 | 122.12 | 31.12 |
| | SVM | 655.31 | 147.70 | 562.14 | 109.84 | 390.52 | 84.30 | 144.29 | 57.22 | 631.61 | 128.77 | 551.01 | 97.28 | 448.94 | 97.82 | 604.68 | 124.27 | 501.74 | 101.37 | 272.56 | 62.96 |

Table 13: Mean and standard deviation of the testing MSE for the linear simulations when $n = 200$ and $p = 10$. See Figure 13 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 | 1.05 | 0.11 |
| | AIC B | 1.04 | 0.11 | 1.04 | 0.11 | 1.03 | 0.11 | 1.04 | 0.11 | 1.03 | 0.10 | 1.04 | 0.11 | 1.04 | 0.11 | 1.04 | 0.11 | 1.03 | 0.11 | 1.04 | 0.11 |
| | BIC B | 1.02 | 0.10 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 | 1.02 | 0.11 | 1.02 | 0.10 | 1.03 | 0.11 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 |
| | AIC SB | 1.04 | 0.11 | 1.04 | 0.11 | 1.03 | 0.11 | 1.04 | 0.11 | 1.03 | 0.10 | 1.04 | 0.11 | 1.04 | 0.11 | 1.04 | 0.11 | 1.03 | 0.11 | 1.04 | 0.11 |
| | BIC SB | 1.02 | 0.10 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 | 1.02 | 0.11 | 1.02 | 0.10 | 1.03 | 0.11 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 |
| | AIC F | 1.04 | 0.11 | 1.03 | 0.11 | 1.03 | 0.11 | 1.04 | 0.11 | 1.03 | 0.10 | 1.04 | 0.10 | 1.03 | 0.11 | 1.04 | 0.11 | 1.03 | 0.11 | 1.03 | 0.11 |
| | BIC F | 1.02 | 0.10 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 | 1.02 | 0.11 | 1.02 | 0.10 | 1.03 | 0.11 | 1.02 | 0.10 | 1.02 | 0.10 | 1.03 | 0.11 |
| | AIC SF | 1.04 | 0.11 | 1.03 | 0.11 | 1.03 | 0.11 | 1.04 | 0.11 | 1.03 | 0.10 | 1.04 | 0.10 | 1.03 | 0.11 | 1.04 | 0.11 | 1.03 | 0.11 | 1.03 | 0.11 |
| | BIC SF | 1.02 | 0.10 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 | 1.02 | 0.11 | 1.02 | 0.10 | 1.03 | 0.11 | 1.02 | 0.10 | 1.02 | 0.10 | 1.03 | 0.11 |
| | Ridge | 1.21 | 0.14 | 1.25 | 0.15 | 1.31 | 0.17 | 1.54 | 0.17 | 1.23 | 0.14 | 1.31 | 0.16 | 1.48 | 0.17 | 1.25 | 0.14 | 1.30 | 0.16 | 1.52 | 0.16 |
| | Lasso | 1.12 | 0.13 | 1.11 | 0.13 | 1.11 | 0.14 | 1.12 | 0.13 | 1.11 | 0.12 | 1.12 | 0.13 | 1.12 | 0.13 | 1.11 | 0.12 | 1.11 | 0.14 | 1.12 | 0.13 |
| | E-net | 1.12 | 0.13 | 1.12 | 0.13 | 1.11 | 0.14 | 1.12 | 0.13 | 1.11 | 0.12 | 1.13 | 0.13 | 1.12 | 0.13 | 1.11 | 0.13 | 1.11 | 0.14 | 1.13 | 0.13 |
| | SCAD | 1.02 | 0.10 | 1.02 | 0.10 | 1.02 | 0.11 | 1.03 | 0.11 | 1.02 | 0.10 | 1.02 | 0.10 | 1.04 | 0.11 | 1.02 | 0.10 | 1.02 | 0.11 | 1.04 | 0.11 |
| | MCP | 1.02 | 0.11 | 1.02 | 0.11 | 1.02 | 0.11 | 1.03 | 0.11 | 1.02 | 0.10 | 1.02 | 0.11 | 1.04 | 0.10 | 1.02 | 0.10 | 1.02 | 0.11 | 1.04 | 0.11 |
| | XGBoost | 1.74 | 0.24 | 1.81 | 0.24 | 1.77 | 0.28 | 1.71 | 0.24 | 1.76 | 0.26 | 1.77 | 0.25 | 1.76 | 0.28 | 1.75 | 0.22 | 1.77 | 0.23 | 1.73 | 0.24 |
| | RF | 3.51 | 0.53 | 3.65 | 0.52 | 3.18 | 0.41 | 1.81 | 0.19 | 3.52 | 0.51 | 3.62 | 0.47 | 2.02 | 0.24 | 3.61 | 0.53 | 3.64 | 0.51 | 2.14 | 0.22 |
| | SVM | 3.31 | 0.56 | 3.07 | 0.53 | 2.34 | 0.50 | 1.60 | 0.41 | 3.10 | 0.49 | 2.72 | 0.48 | 1.77 | 0.42 | 3.03 | 0.51 | 2.43 | 0.49 | 1.67 | 0.26 |
| 3 | OLS | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 | 9.43 | 0.98 |
| | AIC B | 9.33 | 0.97 | 9.32 | 0.98 | 9.31 | 0.96 | 9.35 | 0.98 | 9.30 | 0.96 | 9.30 | 0.97 | 9.31 | 0.98 | 9.30 | 0.96 | 9.31 | 0.95 | 9.33 | 0.97 |
| | BIC B | 9.19 | 0.94 | 9.21 | 0.96 | 9.17 | 0.95 | 9.26 | 0.96 | 9.20 | 0.92 | 9.20 | 0.93 | 9.29 | 0.92 | 9.21 | 0.95 | 9.18 | 0.92 | 9.26 | 0.96 |
| | AIC SB | 9.33 | 0.97 | 9.32 | 0.98 | 9.31 | 0.96 | 9.35 | 0.98 | 9.30 | 0.96 | 9.30 | 0.97 | 9.31 | 0.98 | 9.30 | 0.96 | 9.31 | 0.95 | 9.33 | 0.97 |
| | BIC SB | 9.19 | 0.94 | 9.21 | 0.96 | 9.17 | 0.95 | 9.26 | 0.96 | 9.20 | 0.92 | 9.20 | 0.93 | 9.29 | 0.92 | 9.21 | 0.95 | 9.18 | 0.92 | 9.26 | 0.96 |
| | AIC F | 9.33 | 0.97 | 9.32 | 0.98 | 9.30 | 0.96 | 9.33 | 0.98 | 9.29 | 0.96 | 9.30 | 0.97 | 9.29 | 0.97 | 9.29 | 0.96 | 9.30 | 0.95 | 9.30 | 0.96 |
| | BIC F | 9.19 | 0.94 | 9.21 | 0.96 | 9.17 | 0.95 | 9.25 | 0.95 | 9.20 | 0.92 | 9.19 | 0.94 | 9.28 | 0.91 | 9.20 | 0.95 | 9.17 | 0.92 | 9.25 | 0.98 |
| | AIC SF | 9.33 | 0.97 | 9.32 | 0.98 | 9.30 | 0.96 | 9.33 | 0.98 | 9.29 | 0.96 | 9.30 | 0.97 | 9.29 | 0.97 | 9.29 | 0.96 | 9.30 | 0.95 | 9.30 | 0.96 |
| | BIC SF | 9.19 | 0.94 | 9.21 | 0.96 | 9.17 | 0.95 | 9.25 | 0.95 | 9.20 | 0.92 | 9.19 | 0.94 | 9.27 | 0.91 | 9.20 | 0.95 | 9.17 | 0.92 | 9.25 | 0.98 |
| | Ridge | 10.91 | 1.25 | 11.23 | 1.26 | 11.85 | 1.50 | 13.72 | 1.65 | 11.13 | 1.31 | 11.77 | 1.55 | 13.21 | 1.60 | 11.12 | 1.34 | 11.77 | 1.38 | 13.66 | 1.84 |
| | Lasso | 10.09 | 1.18 | 10.17 | 1.14 | 10.06 | 1.13 | 10.07 | 1.19 | 10.10 | 1.15 | 10.06 | 1.24 | 10.07 | 1.22 | 10.01 | 1.24 | 9.98 | 1.09 | 9.99 | 1.31 |
| | E-net | 10.10 | 1.18 | 10.19 | 1.14 | 10.08 | 1.14 | 10.06 | 1.20 | 10.10 | 1.15 | 10.08 | 1.25 | 10.08 | 1.22 | 10.02 | 1.23 | 10.00 | 1.09 | 10.01 | 1.32 |
| | SCAD | 9.22 | 0.94 | 9.21 | 0.97 | 9.20 | 0.95 | 9.33 | 1.00 | 9.18 | 0.93 | 9.20 | 0.93 | 9.35 | 0.94 | 9.19 | 0.92 | 9.19 | 0.94 | 9.33 | 0.98 |
| | MCP | 9.22 | 0.95 | 9.22 | 0.98 | 9.20 | 0.95 | 9.33 | 1.00 | 9.18 | 0.93 | 9.20 | 0.93 | 9.37 | 0.94 | 9.20 | 0.93 | 9.19 | 0.94 | 9.34 | 0.98 |
| | XGBoost | 15.58 | 2.00 | 16.16 | 2.44 | 16.15 | 2.00 | 15.29 | 2.42 | 16.02 | 2.12 | 16.04 | 2.25 | 15.54 | 2.34 | 15.87 | 2.19 | 15.88 | 2.00 | 15.44 | 2.07 |
| | RF | 31.64 | 4.75 | 32.85 | 4.75 | 28.97 | 4.01 | 16.25 | 2.26 | 32.44 | 4.66 | 32.31 | 4.55 | 17.87 | 2.13 | 32.17 | 5.06 | 31.90 | 3.85 | 19.16 | 2.41 |
| | SVM | 29.78 | 5.08 | 27.23 | 5.11 | 21.54 | 4.34 | 14.17 | 3.81 | 28.19 | 4.64 | 23.99 | 3.91 | 15.92 | 3.71 | 27.32 | 5.18 | 21.34 | 3.50 | 15.54 | 3.21 |
| 6 | OLS | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 | 37.70 | 3.91 |
| | AIC B | 37.31 | 3.90 | 37.29 | 3.91 | 37.22 | 3.85 | 37.39 | 3.92 | 37.21 | 3.86 | 37.22 | 3.88 | 37.25 | 3.91 | 37.19 | 3.83 | 37.22 | 3.80 | 37.30 | 3.88 |
| | BIC B | 36.75 | 3.76 | 36.84 | 3.84 | 36.67 | 3.78 | 37.06 | 3.85 | 36.78 | 3.68 | 36.79 | 3.71 | 37.15 | 3.67 | 36.82 | 3.82 | 36.72 | 3.70 | 37.03 | 3.86 |
| | AIC SB | 37.31 | 3.90 | 37.29 | 3.91 | 37.22 | 3.85 | 37.39 | 3.92 | 37.21 | 3.86 | 37.22 | 3.88 | 37.25 | 3.91 | 37.19 | 3.83 | 37.22 | 3.80 | 37.30 | 3.88 |
| | BIC SB | 36.75 | 3.76 | 36.84 | 3.84 | 36.67 | 3.78 | 37.06 | 3.85 | 36.78 | 3.68 | 36.79 | 3.71 | 37.15 | 3.67 | 36.82 | 3.82 | 36.72 | 3.70 | 37.03 | 3.86 |
| | AIC F | 37.30 | 3.88 | 37.29 | 3.91 | 37.22 | 3.85 | 37.32 | 3.93 | 37.18 | 3.82 | 37.21 | 3.87 | 37.15 | 3.89 | 37.18 | 3.82 | 37.20 | 3.78 | 37.21 | 3.84 |
| | BIC F | 36.75 | 3.76 | 36.84 | 3.84 | 36.67 | 3.78 | 37.01 | 3.80 | 36.78 | 3.68 | 36.75 | 3.75 | 37.10 | 3.66 | 36.82 | 3.81 | 36.68 | 3.70 | 37.01 | 3.90 |
| | AIC SF | 37.30 | 3.88 | 37.29 | 3.91 | 37.22 | 3.85 | 37.32 | 3.93 | 37.18 | 3.82 | 37.21 | 3.87 | 37.15 | 3.89 | 37.18 | 3.82 | 37.20 | 3.78 | 37.20 | 3.84 |
| | BIC SF | 36.75 | 3.76 | 36.84 | 3.84 | 36.67 | 3.78 | 37.01 | 3.80 | 36.78 | 3.68 | 36.75 | 3.75 | 37.09 | 3.64 | 36.82 | 3.81 | 36.68 | 3.70 | 37.01 | 3.90 |
| | Ridge | 43.63 | 4.99 | 44.93 | 5.03 | 47.39 | 6.01 | 54.89 | 6.61 | 44.53 | 5.23 | 47.08 | 6.22 | 52.84 | 6.42 | 44.47 | 5.36 | 47.08 | 5.54 | 54.62 | 7.36 |
| | Lasso | 40.35 | 4.71 | 40.68 | 4.55 | 40.26 | 4.54 | 40.28 | 4.74 | 40.40 | 4.62 | 40.22 | 4.97 | 40.28 | 4.88 | 40.03 | 4.96 | 39.91 | 4.35 | 39.97 | 5.25 |
| | E-net | 40.41 | 4.72 | 40.75 | 4.55 | 40.32 | 4.57 | 40.26 | 4.79 | 40.42 | 4.59 | 40.31 | 5.00 | 40.33 | 4.87 | 40.10 | 4.92 | 40.00 | 4.37 | 40.03 | 5.27 |
| | SCAD | 36.86 | 3.78 | 36.86 | 3.87 | 36.78 | 3.78 | 37.31 | 3.99 | 36.71 | 3.74 | 36.80 | 3.73 | 37.40 | 3.75 | 36.78 | 3.69 | 36.75 | 3.75 | 37.34 | 3.93 |
| | MCP | 36.88 | 3.81 | 36.89 | 3.93 | 36.81 | 3.81 | 37.31 | 4.01 | 36.73 | 3.73 | 36.81 | 3.74 | 37.48 | 3.77 | 36.79 | 3.74 | 36.75 | 3.74 | 37.34 | 3.91 |
| | XGBoost | 62.13 | 7.92 | 64.48 | 9.29 | 65.16 | 9.26 | 60.70 | 8.03 | 64.10 | 8.41 | 64.53 | 8.87 | 62.70 | 9.49 | 63.99 | 9.03 | 63.65 | 7.75 | 61.81 | 8.13 |
| | RF | 126.58 | 18.92 | 131.48 | 19.00 | 115.91 | 16.03 | 65.01 | 9.07 | 129.72 | 18.65 | 129.29 | 18.29 | 71.50 | 8.58 | 128.72 | 20.24 | 127.61 | 15.45 | 76.65 | 9.62 |
| | SVM | 119.13 | 20.32 | 108.91 | 20.46 | 86.15 | 17.37 | 56.81 | 15.64 | 112.76 | 18.58 | 95.97 | 15.63 | 63.83 | 14.76 | 109.26 | 20.71 | 85.38 | 13.99 | 62.11 | 12.87 |

Table 14: Mean and standard deviation of the testing MSE for the linear simulations when $n = 200$ and $p = 100$. See Figure 14 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 | 2.05 | 0.28 |
| | AIC F | 1.50 | 0.23 | 1.49 | 0.21 | 1.47 | 0.22 | 1.49 | 0.23 | 1.51 | 0.23 | 1.42 | 0.20 | 1.25 | 0.20 | 1.46 | 0.21 | 1.47 | 0.20 | 1.26 | 0.20 |
| | BIC F | 1.11 | 0.14 | 1.11 | 0.14 | 1.10 | 0.14 | 1.11 | 0.14 | 1.11 | 0.13 | 1.10 | 0.12 | 1.08 | 0.15 | 1.10 | 0.13 | 1.08 | 0.12 | 1.06 | 0.12 |
| | AIC SF | 1.51 | 0.23 | 1.50 | 0.21 | 1.47 | 0.23 | 1.50 | 0.23 | 1.52 | 0.23 | 1.42 | 0.20 | 1.25 | 0.20 | 1.46 | 0.21 | 1.49 | 0.22 | 1.27 | 0.23 |
| | BIC SF | 1.11 | 0.13 | 1.11 | 0.14 | 1.10 | 0.14 | 1.11 | 0.14 | 1.11 | 0.13 | 1.10 | 0.12 | 1.08 | 0.15 | 1.10 | 0.13 | 1.08 | 0.12 | 1.06 | 0.12 |
| | Ridge | 2.23 | 0.38 | 2.27 | 0.35 | 2.25 | 0.35 | 1.91 | 0.22 | 2.29 | 0.37 | 2.32 | 0.33 | 1.96 | 0.24 | 2.27 | 0.36 | 2.24 | 0.32 | 1.94 | 0.24 |
| | Lasso | 1.21 | 0.16 | 1.18 | 0.12 | 1.18 | 0.15 | 1.18 | 0.13 | 1.21 | 0.17 | 1.23 | 0.15 | 1.23 | 0.15 | 1.20 | 0.14 | 1.18 | 0.15 | 1.21 | 0.16 |
| | E-net | 1.22 | 0.17 | 1.20 | 0.13 | 1.19 | 0.15 | 1.20 | 0.13 | 1.23 | 0.17 | 1.25 | 0.15 | 1.25 | 0.15 | 1.22 | 0.14 | 1.20 | 0.15 | 1.22 | 0.16 |
| | SCAD | 1.03 | 0.12 | 1.04 | 0.11 | 1.03 | 0.11 | 1.05 | 0.12 | 1.05 | 0.11 | 1.04 | 0.11 | 1.06 | 0.11 | 1.04 | 0.11 | 1.04 | 0.12 | 1.06 | 0.11 |
| | MCP | 1.03 | 0.12 | 1.04 | 0.11 | 1.04 | 0.12 | 1.05 | 0.12 | 1.04 | 0.11 | 1.04 | 0.11 | 1.06 | 0.11 | 1.03 | 0.11 | 1.04 | 0.12 | 1.06 | 0.12 |
| | XGBoost | 2.26 | 0.33 | 2.25 | 0.33 | 2.33 | 0.33 | 2.05 | 0.25 | 2.24 | 0.32 | 2.30 | 0.34 | 2.23 | 0.26 | 2.23 | 0.31 | 2.28 | 0.34 | 2.08 | 0.28 |
| | RF | 5.48 | 0.77 | 5.66 | 0.75 | 4.65 | 0.53 | 2.21 | 0.25 | 5.63 | 0.81 | 5.21 | 0.56 | 2.21 | 0.25 | 5.57 | 0.80 | 4.45 | 0.58 | 2.09 | 0.23 |
| | SVM | 8.39 | 0.84 | 7.54 | 0.82 | 5.18 | 0.64 | 2.32 | 0.34 | 8.19 | 0.99 | 7.05 | 0.64 | 3.92 | 0.48 | 7.76 | 0.90 | 6.09 | 0.69 | 3.21 | 0.45 |
| 3 | OLS | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 | 18.46 | 2.55 |
| | AIC F | 13.48 | 2.06 | 13.53 | 1.78 | 13.50 | 2.14 | 13.51 | 1.92 | 13.56 | 2.06 | 12.69 | 1.65 | 11.26 | 1.61 | 13.32 | 1.90 | 12.94 | 1.90 | 11.23 | 1.75 |
| | BIC F | 10.01 | 1.22 | 9.84 | 1.25 | 9.88 | 1.21 | 10.07 | 1.24 | 9.97 | 1.13 | 9.86 | 1.10 | 9.72 | 1.32 | 9.87 | 1.16 | 9.74 | 1.10 | 9.67 | 1.15 |
| | AIC SF | 13.56 | 2.04 | 13.56 | 1.73 | 13.54 | 2.11 | 13.55 | 1.96 | 13.59 | 2.06 | 12.68 | 1.64 | 11.25 | 1.70 | 13.40 | 1.98 | 13.00 | 1.93 | 11.20 | 1.69 |
| | BIC SF | 10.00 | 1.21 | 9.84 | 1.24 | 9.88 | 1.21 | 10.08 | 1.25 | 9.98 | 1.13 | 9.87 | 1.10 | 9.72 | 1.33 | 9.88 | 1.17 | 9.74 | 1.11 | 9.67 | 1.15 |
| | Ridge | 20.09 | 3.38 | 20.56 | 3.56 | 20.27 | 2.80 | 16.79 | 2.15 | 20.53 | 3.12 | 20.70 | 3.32 | 17.67 | 2.17 | 19.91 | 3.20 | 20.68 | 3.36 | 17.35 | 2.13 |
| | Lasso | 10.87 | 1.47 | 10.70 | 1.27 | 10.91 | 1.43 | 10.65 | 1.41 | 10.83 | 1.46 | 11.05 | 1.33 | 11.11 | 1.35 | 10.72 | 1.33 | 10.73 | 1.36 | 10.96 | 1.47 |
| | E-net | 11.02 | 1.51 | 10.83 | 1.31 | 11.02 | 1.41 | 10.74 | 1.42 | 10.94 | 1.49 | 11.20 | 1.37 | 11.20 | 1.34 | 10.85 | 1.35 | 10.84 | 1.40 | 11.08 | 1.48 |
| | SCAD | 9.30 | 1.06 | 9.31 | 1.02 | 9.33 | 1.05 | 9.60 | 1.14 | 9.33 | 0.97 | 9.36 | 1.04 | 9.52 | 1.05 | 9.29 | 0.99 | 9.35 | 1.03 | 9.49 | 1.08 |
| | MCP | 9.27 | 1.05 | 9.30 | 1.02 | 9.31 | 1.04 | 9.59 | 1.13 | 9.31 | 0.97 | 9.34 | 1.02 | 9.56 | 1.07 | 9.27 | 0.99 | 9.32 | 1.05 | 9.49 | 1.08 |
| | XGBoost | 20.30 | 3.04 | 20.51 | 2.81 | 21.01 | 2.95 | 18.51 | 2.56 | 20.31 | 2.91 | 20.81 | 3.37 | 19.81 | 2.34 | 20.50 | 3.49 | 20.58 | 3.12 | 18.56 | 2.46 |
| | RF | 49.29 | 6.97 | 50.03 | 6.71 | 42.19 | 4.73 | 19.64 | 2.36 | 49.84 | 7.85 | 46.91 | 5.75 | 19.85 | 2.37 | 50.11 | 7.19 | 41.09 | 5.37 | 18.97 | 2.13 |
| | SVM | 75.55 | 7.59 | 65.95 | 7.59 | 46.92 | 5.58 | 20.73 | 2.96 | 72.85 | 9.51 | 63.65 | 6.84 | 35.29 | 4.32 | 70.26 | 8.28 | 56.81 | 6.45 | 29.01 | 3.91 |
| 6 | OLS | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 | 73.85 | 10.20 |
| | AIC F | 53.93 | 8.26 | 54.10 | 7.14 | 54.00 | 8.55 | 54.05 | 7.68 | 54.24 | 8.23 | 50.77 | 6.60 | 45.04 | 6.44 | 53.27 | 7.61 | 51.78 | 7.59 | 44.91 | 6.99 |
| | BIC F | 40.05 | 4.89 | 39.37 | 4.98 | 39.53 | 4.85 | 40.29 | 4.97 | 39.88 | 4.51 | 39.43 | 4.40 | 38.86 | 5.28 | 39.50 | 4.64 | 38.95 | 4.39 | 38.68 | 4.60 |
| | AIC SF | 54.26 | 8.17 | 54.23 | 6.93 | 54.14 | 8.43 | 54.21 | 7.84 | 54.36 | 8.24 | 50.72 | 6.57 | 44.99 | 6.80 | 53.61 | 7.93 | 51.99 | 7.73 | 44.80 | 6.75 |
| | BIC SF | 40.00 | 4.83 | 39.36 | 4.97 | 39.51 | 4.85 | 40.31 | 5.00 | 39.90 | 4.50 | 39.46 | 4.39 | 38.89 | 5.30 | 39.50 | 4.67 | 38.97 | 4.46 | 38.68 | 4.60 |
| | Ridge | 80.38 | 13.51 | 82.26 | 14.25 | 81.09 | 11.18 | 67.17 | 8.61 | 82.13 | 12.49 | 82.79 | 13.27 | 70.69 | 8.69 | 79.64 | 12.80 | 82.72 | 13.44 | 69.39 | 8.50 |
| | Lasso | 43.50 | 5.87 | 42.82 | 5.08 | 43.65 | 5.70 | 42.61 | 5.64 | 43.32 | 5.86 | 44.21 | 5.34 | 44.44 | 5.41 | 42.88 | 5.31 | 42.92 | 5.44 | 43.84 | 5.87 |
| | E-net | 44.08 | 6.04 | 43.31 | 5.25 | 44.09 | 5.64 | 42.96 | 5.67 | 43.76 | 5.98 | 44.81 | 5.47 | 44.79 | 5.37 | 43.41 | 5.39 | 43.37 | 5.61 | 44.33 | 5.91 |
| | SCAD | 37.18 | 4.23 | 37.24 | 4.07 | 37.30 | 4.19 | 38.40 | 4.55 | 37.34 | 3.88 | 37.45 | 4.17 | 38.09 | 4.19 | 37.15 | 3.97 | 37.38 | 4.10 | 37.95 | 4.32 |
| | MCP | 37.07 | 4.21 | 37.20 | 4.09 | 37.23 | 4.15 | 38.38 | 4.54 | 37.23 | 3.87 | 37.35 | 4.09 | 38.25 | 4.27 | 37.09 | 3.95 | 37.27 | 4.20 | 37.96 | 4.31 |
| | XGBoost | 81.50 | 11.91 | 81.88 | 10.71 | 83.66 | 11.57 | 73.85 | 10.38 | 81.59 | 12.06 | 83.32 | 11.49 | 79.39 | 9.53 | 81.52 | 13.48 | 82.41 | 12.54 | 74.43 | 10.21 |
| | RF | 197.24 | 27.79 | 200.16 | 26.69 | 168.74 | 18.86 | 78.56 | 9.45 | 199.18 | 31.30 | 187.66 | 23.04 | 79.45 | 9.49 | 200.43 | 28.80 | 164.34 | 21.50 | 75.85 | 8.45 |
| | SVM | 302.19 | 30.36 | 263.81 | 30.37 | 187.68 | 22.31 | 82.96 | 11.89 | 291.40 | 38.02 | 254.60 | 27.34 | 141.17 | 17.27 | 281.04 | 33.10 | 227.25 | 25.80 | 116.19 | 15.89 |

Table 15: Mean and standard deviation of the testing MSE for the linear simulations when $n = 200$ and $p = 2000$. See Figure 15 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 18.24 | 1.78 | 15.37 | 1.72 | 10.03 | 1.14 | 2.95 | 0.34 | 17.08 | 1.69 | 15.13 | 1.50 | 9.21 | 1.15 | 16.55 | 1.94 | 10.99 | 1.39 | 3.41 | 0.40 |
| | Lasso | 1.36 | 0.16 | 1.36 | 0.20 | 1.35 | 0.18 | 1.31 | 0.17 | 1.36 | 0.17 | 1.44 | 0.18 | 1.91 | 0.23 | 1.38 | 0.21 | 1.41 | 0.18 | 1.48 | 0.26 |
| | E-net | 1.41 | 0.17 | 1.40 | 0.21 | 1.39 | 0.19 | 1.34 | 0.18 | 1.41 | 0.18 | 1.50 | 0.20 | 1.94 | 0.24 | 1.43 | 0.23 | 1.46 | 0.19 | 1.51 | 0.27 |
| | SCAD | 1.08 | 0.11 | 1.07 | 0.12 | 1.08 | 0.11 | 1.17 | 0.30 | 1.08 | 0.11 | 1.09 | 0.12 | 1.43 | 0.39 | 1.08 | 0.11 | 1.10 | 0.13 | 1.25 | 0.36 |
| | MCP | 1.06 | 0.11 | 1.06 | 0.11 | 1.07 | 0.12 | 1.08 | 0.14 | 1.07 | 0.11 | 1.07 | 0.11 | 1.28 | 0.35 | 1.06 | 0.11 | 1.08 | 0.12 | 1.13 | 0.25 |
| | XGBoost | 2.86 | 0.42 | 2.92 | 0.46 | 3.22 | 0.56 | 2.54 | 0.32 | 2.96 | 0.46 | 3.34 | 0.57 | 2.46 | 0.29 | 3.02 | 0.58 | 3.23 | 0.60 | 2.51 | 0.32 |
| | RF | 7.80 | 1.21 | 7.80 | 1.02 | 6.01 | 0.74 | 2.56 | 0.32 | 7.91 | 1.05 | 6.41 | 0.81 | 2.41 | 0.32 | 7.70 | 1.05 | 5.49 | 0.70 | 2.39 | 0.27 |
| | SVM | 17.61 | 1.69 | 14.70 | 1.50 | 9.67 | 1.07 | 3.03 | 0.50 | 16.49 | 1.64 | 14.45 | 1.39 | 9.73 | 1.15 | 15.73 | 1.65 | 10.77 | 1.14 | 4.54 | 0.54 |
| 3 | Ridge | 164.19 | 15.99 | 137.35 | 13.97 | 88.81 | 9.56 | 26.52 | 2.98 | 153.91 | 14.22 | 136.63 | 13.51 | 83.56 | 9.80 | 147.09 | 15.34 | 100.31 | 11.60 | 30.21 | 3.33 |
| | Lasso | 12.26 | 1.45 | 12.07 | 1.55 | 11.97 | 1.51 | 12.02 | 1.58 | 12.31 | 1.53 | 12.92 | 1.60 | 17.23 | 2.16 | 12.48 | 1.80 | 12.63 | 1.61 | 12.98 | 2.05 |
| | E-net | 12.67 | 1.57 | 12.43 | 1.65 | 12.33 | 1.59 | 12.29 | 1.61 | 12.74 | 1.66 | 13.48 | 1.71 | 17.55 | 2.18 | 12.90 | 1.92 | 13.05 | 1.71 | 13.31 | 2.13 |
| | SCAD | 9.71 | 1.02 | 9.68 | 1.01 | 9.76 | 1.03 | 10.86 | 2.96 | 9.76 | 0.99 | 9.80 | 1.03 | 12.91 | 3.67 | 9.82 | 1.10 | 9.84 | 1.08 | 11.24 | 3.18 |
| | MCP | 9.51 | 0.97 | 9.52 | 0.95 | 9.60 | 1.02 | 9.89 | 1.67 | 9.61 | 0.97 | 9.61 | 1.01 | 11.58 | 3.11 | 9.66 | 1.02 | 9.67 | 1.08 | 10.51 | 2.70 |
| | XGBoost | 25.69 | 3.90 | 26.96 | 5.37 | 28.35 | 5.28 | 22.88 | 2.49 | 26.77 | 4.41 | 30.29 | 5.09 | 22.52 | 2.55 | 27.44 | 4.72 | 29.13 | 4.40 | 21.98 | 2.74 |
| | RF | 70.19 | 10.91 | 69.60 | 9.68 | 52.80 | 6.29 | 22.99 | 2.40 | 70.83 | 10.21 | 57.90 | 7.36 | 21.57 | 2.68 | 68.14 | 8.93 | 49.46 | 6.04 | 20.88 | 2.45 |
| | SVM | 158.45 | 15.21 | 129.86 | 11.43 | 85.01 | 9.37 | 27.14 | 4.26 | 148.54 | 13.88 | 130.69 | 12.51 | 87.63 | 9.18 | 139.80 | 12.99 | 98.33 | 9.93 | 39.83 | 4.25 |
| 6 | Ridge | 656.77 | 63.95 | 549.41 | 55.90 | 355.23 | 38.25 | 106.09 | 11.90 | 614.56 | 57.65 | 546.52 | 54.05 | 334.26 | 39.19 | 588.38 | 61.37 | 401.23 | 46.40 | 120.84 | 13.30 |
| | Lasso | 49.05 | 5.79 | 48.26 | 6.19 | 47.88 | 6.04 | 48.10 | 6.33 | 48.92 | 6.01 | 51.69 | 6.38 | 68.92 | 8.64 | 49.92 | 7.20 | 50.53 | 6.42 | 51.92 | 8.18 |
| | E-net | 50.68 | 6.27 | 49.72 | 6.61 | 49.33 | 6.38 | 49.17 | 6.44 | 50.62 | 6.46 | 53.91 | 6.82 | 70.20 | 8.73 | 51.59 | 7.68 | 52.19 | 6.83 | 53.25 | 8.51 |
| | SCAD | 38.84 | 4.09 | 38.73 | 4.03 | 39.03 | 4.11 | 43.43 | 11.82 | 38.85 | 3.85 | 39.19 | 4.12 | 51.64 | 14.67 | 39.30 | 4.40 | 39.36 | 4.30 | 44.96 | 12.71 |
| | MCP | 38.04 | 3.89 | 38.07 | 3.81 | 38.41 | 4.07 | 39.57 | 6.70 | 38.27 | 3.79 | 38.44 | 4.06 | 46.32 | 12.46 | 38.63 | 4.10 | 38.70 | 4.33 | 42.04 | 10.80 |
| | XGBoost | 102.38 | 14.70 | 107.83 | 20.20 | 113.79 | 21.45 | 90.81 | 9.34 | 106.42 | 17.13 | 122.32 | 20.64 | 89.52 | 10.49 | 109.21 | 18.04 | 117.61 | 19.04 | 88.38 | 11.54 |
| | RF | 280.84 | 43.37 | 278.41 | 38.51 | 211.28 | 25.28 | 91.89 | 9.60 | 283.70 | 40.27 | 231.76 | 29.52 | 86.35 | 10.76 | 272.60 | 35.67 | 197.82 | 24.23 | 83.58 | 9.82 |
| | SVM | 633.86 | 60.83 | 519.38 | 45.68 | 340.05 | 37.47 | 108.60 | 17.11 | 592.76 | 56.91 | 523.03 | 50.00 | 350.50 | 36.72 | 558.84 | 51.50 | 393.34 | 39.70 | 159.33 | 16.98 |

Table 16: Mean and standard deviation of the testing MSE for the linear simulations when $n = 1000$ and $p = 10$. See Figure 16 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | AIC B | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | BIC B | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | AIC SB | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | BIC SB | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | AIC F | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | BIC F | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | AIC SF | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | BIC SF | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | Ridge | 1.14 | 0.06 | 1.15 | 0.06 | 1.22 | 0.06 | 1.44 | 0.08 | 1.15 | 0.06 | 1.21 | 0.07 | 1.40 | 0.06 | 1.15 | 0.06 | 1.20 | 0.06 | 1.41 | 0.07 |
| | Lasso | 1.06 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 |
| | E-net | 1.06 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.06 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 | 1.05 | 0.05 |
| | SCAD | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | MCP | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | XGBoost | 1.22 | 0.07 | 1.23 | 0.06 | 1.22 | 0.06 | 1.22 | 0.06 | 1.22 | 0.06 | 1.22 | 0.05 | 1.21 | 0.06 | 1.22 | 0.06 | 1.21 | 0.06 | 1.21 | 0.06 |
| | RF | 2.03 | 0.15 | 2.05 | 0.15 | 1.93 | 0.11 | 1.37 | 0.06 | 2.04 | 0.14 | 2.17 | 0.13 | 1.61 | 0.08 | 2.03 | 0.15 | 2.16 | 0.14 | 1.68 | 0.08 |
| | SVM | 1.85 | 0.14 | 1.78 | 0.12 | 1.55 | 0.11 | 1.16 | 0.08 | 1.81 | 0.12 | 1.66 | 0.12 | 1.26 | 0.09 | 1.78 | 0.12 | 1.61 | 0.10 | 1.23 | 0.08 |
| 3 | OLS | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 | 9.13 | 0.40 |
| | AIC B | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.39 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.39 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 |
| | BIC B | 9.07 | 0.40 | 9.08 | 0.40 | 9.07 | 0.40 | 9.07 | 0.39 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 |
| | AIC SB | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.39 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.39 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 |
| | BIC SB | 9.07 | 0.40 | 9.08 | 0.40 | 9.07 | 0.40 | 9.07 | 0.39 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 |
| | AIC F | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.39 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 | 9.09 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 |
| | BIC F | 9.07 | 0.40 | 9.08 | 0.40 | 9.07 | 0.40 | 9.07 | 0.39 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 |
| | AIC SF | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.39 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 | 9.09 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 | 9.10 | 0.40 |
| | BIC SF | 9.07 | 0.40 | 9.08 | 0.40 | 9.07 | 0.40 | 9.07 | 0.39 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 | 9.07 | 0.40 |
| | Ridge | 10.24 | 0.50 | 10.38 | 0.50 | 10.93 | 0.58 | 12.85 | 0.64 | 10.34 | 0.52 | 10.85 | 0.58 | 12.68 | 0.58 | 10.29 | 0.52 | 10.82 | 0.61 | 12.63 | 0.66 |
| | Lasso | 9.51 | 0.45 | 9.48 | 0.44 | 9.47 | 0.45 | 9.47 | 0.45 | 9.48 | 0.46 | 9.47 | 0.44 | 9.50 | 0.43 | 9.46 | 0.47 | 9.44 | 0.45 | 9.46 | 0.45 |
| | E-net | 9.51 | 0.45 | 9.48 | 0.44 | 9.47 | 0.45 | 9.47 | 0.45 | 9.47 | 0.46 | 9.48 | 0.45 | 9.50 | 0.44 | 9.46 | 0.47 | 9.45 | 0.46 | 9.46 | 0.44 |
| | SCAD | 9.07 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.39 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 |
| | MCP | 9.07 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 | 9.08 | 0.40 |
| | XGBoost | 11.00 | 0.59 | 10.94 | 0.50 | 10.91 | 0.52 | 11.03 | 0.69 | 10.98 | 0.55 | 10.94 | 0.55 | 11.07 | 0.71 | 10.97 | 0.57 | 10.93 | 0.53 | 10.87 | 0.50 |
| | RF | 18.28 | 1.33 | 18.29 | 1.11 | 17.19 | 1.02 | 12.36 | 0.59 | 18.25 | 1.36 | 19.44 | 1.14 | 14.55 | 0.69 | 18.33 | 1.24 | 19.33 | 1.17 | 15.06 | 0.67 |
| | SVM | 16.69 | 1.28 | 16.02 | 1.07 | 13.84 | 0.88 | 10.42 | 0.75 | 16.22 | 1.11 | 14.93 | 1.04 | 11.24 | 0.76 | 16.04 | 0.95 | 14.39 | 0.91 | 11.08 | 0.67 |
| 6 | OLS | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 | 36.50 | 1.59 |
| | AIC B | 36.41 | 1.60 | 36.40 | 1.59 | 36.40 | 1.57 | 36.41 | 1.60 | 36.40 | 1.60 | 36.41 | 1.57 | 36.39 | 1.62 | 36.41 | 1.58 | 36.41 | 1.61 | 36.39 | 1.60 |
| | BIC B | 36.28 | 1.60 | 36.30 | 1.60 | 36.28 | 1.59 | 36.26 | 1.58 | 36.30 | 1.60 | 36.29 | 1.59 | 36.29 | 1.61 | 36.29 | 1.60 | 36.28 | 1.60 | 36.28 | 1.59 |
| | AIC SB | 36.41 | 1.60 | 36.40 | 1.59 | 36.40 | 1.57 | 36.41 | 1.60 | 36.40 | 1.60 | 36.41 | 1.57 | 36.39 | 1.62 | 36.41 | 1.58 | 36.41 | 1.61 | 36.39 | 1.60 |
| | BIC SB | 36.28 | 1.60 | 36.30 | 1.60 | 36.28 | 1.59 | 36.26 | 1.58 | 36.30 | 1.60 | 36.29 | 1.59 | 36.29 | 1.61 | 36.29 | 1.60 | 36.28 | 1.60 | 36.28 | 1.59 |
| | AIC F | 36.41 | 1.60 | 36.40 | 1.59 | 36.40 | 1.58 | 36.41 | 1.60 | 36.40 | 1.60 | 36.39 | 1.58 | 36.37 | 1.60 | 36.41 | 1.58 | 36.40 | 1.61 | 36.39 | 1.61 |
| | BIC F | 36.28 | 1.60 | 36.30 | 1.60 | 36.27 | 1.59 | 36.26 | 1.58 | 36.30 | 1.60 | 36.29 | 1.59 | 36.28 | 1.62 | 36.29 | 1.60 | 36.28 | 1.60 | 36.28 | 1.59 |
| | AIC SF | 36.41 | 1.60 | 36.40 | 1.59 | 36.40 | 1.58 | 36.41 | 1.60 | 36.40 | 1.60 | 36.39 | 1.58 | 36.37 | 1.60 | 36.41 | 1.58 | 36.40 | 1.61 | 36.39 | 1.61 |
| | BIC SF | 36.28 | 1.60 | 36.30 | 1.60 | 36.27 | 1.59 | 36.26 | 1.58 | 36.30 | 1.60 | 36.29 | 1.59 | 36.28 | 1.62 | 36.29 | 1.60 | 36.28 | 1.60 | 36.28 | 1.59 |
| | Ridge | 40.95 | 2.01 | 41.53 | 2.02 | 43.71 | 2.31 | 51.41 | 2.54 | 41.35 | 2.08 | 43.42 | 2.32 | 50.71 | 2.31 | 41.16 | 2.09 | 43.29 | 2.44 | 50.53 | 2.65 |
| | Lasso | 38.04 | 1.82 | 37.90 | 1.76 | 37.87 | 1.81 | 37.86 | 1.79 | 37.90 | 1.84 | 37.90 | 1.78 | 37.99 | 1.73 | 37.85 | 1.88 | 37.78 | 1.82 | 37.83 | 1.78 |
| | E-net | 38.04 | 1.81 | 37.91 | 1.76 | 37.87 | 1.82 | 37.88 | 1.79 | 37.90 | 1.83 | 37.91 | 1.79 | 38.01 | 1.74 | 37.86 | 1.89 | 37.81 | 1.84 | 37.84 | 1.76 |
| | SCAD | 36.29 | 1.58 | 36.32 | 1.59 | 36.33 | 1.59 | 36.33 | 1.59 | 36.32 | 1.61 | 36.32 | 1.58 | 36.32 | 1.61 | 36.31 | 1.59 | 36.32 | 1.58 | 36.33 | 1.62 |
| | MCP | 36.30 | 1.58 | 36.32 | 1.59 | 36.32 | 1.59 | 36.33 | 1.59 | 36.32 | 1.61 | 36.32 | 1.58 | 36.32 | 1.61 | 36.31 | 1.59 | 36.32 | 1.58 | 36.33 | 1.62 |
| | XGBoost | 44.01 | 2.36 | 43.77 | 2.01 | 43.65 | 2.07 | 44.17 | 2.82 | 43.91 | 2.19 | 43.78 | 2.25 | 44.12 | 2.58 | 43.87 | 2.29 | 43.71 | 2.14 | 43.52 | 2.05 |
| | RF | 73.13 | 5.32 | 73.15 | 4.43 | 68.75 | 4.08 | 49.43 | 2.36 | 73.01 | 5.46 | 77.77 | 4.55 | 58.20 | 2.78 | 73.33 | 4.97 | 77.34 | 4.71 | 60.24 | 2.69 |
| | SVM | 66.76 | 5.12 | 64.09 | 4.27 | 55.37 | 3.53 | 41.67 | 3.02 | 64.87 | 4.45 | 59.74 | 4.16 | 44.95 | 3.05 | 64.14 | 3.79 | 57.57 | 3.65 | 44.34 | 2.68 |

Table 17: Mean and standard deviation of the testing MSE for the linear simulations when $n = 1000$ and $p = 100$. See Figure 17 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 | 1.11 | 0.05 |
| | AIC F | 1.07 | 0.05 | 1.07 | 0.05 | 1.07 | 0.05 | 1.07 | 0.05 | 1.07 | 0.05 | 1.06 | 0.05 | 1.04 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.04 | 0.05 |
| | BIC F | 1.01 | 0.05 | 1.01 | 0.04 | 1.01 | 0.05 | 1.01 | 0.05 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.05 | 1.02 | 0.05 | 1.01 | 0.04 | 1.01 | 0.05 |
| | AIC SF | 1.07 | 0.05 | 1.07 | 0.05 | 1.07 | 0.05 | 1.07 | 0.05 | 1.07 | 0.05 | 1.06 | 0.05 | 1.04 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.04 | 0.05 |
| | BIC SF | 1.01 | 0.05 | 1.01 | 0.04 | 1.01 | 0.05 | 1.01 | 0.05 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.05 | 1.02 | 0.05 | 1.01 | 0.04 | 1.01 | 0.05 |
| | Ridge | 1.23 | 0.06 | 1.25 | 0.07 | 1.33 | 0.08 | 1.51 | 0.09 | 1.25 | 0.06 | 1.32 | 0.08 | 1.46 | 0.08 | 1.27 | 0.07 | 1.33 | 0.07 | 1.50 | 0.08 |
| | Lasso | 1.05 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.07 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 |
| | E-net | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.07 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 | 1.06 | 0.05 |
| | SCAD | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.05 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | MCP | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.05 | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 |
| | XGBoost | 1.32 | 0.07 | 1.32 | 0.07 | 1.32 | 0.07 | 1.32 | 0.08 | 1.33 | 0.08 | 1.33 | 0.07 | 1.36 | 0.08 | 1.33 | 0.07 | 1.31 | 0.06 | 1.34 | 0.09 |
| | RF | 2.76 | 0.21 | 2.84 | 0.19 | 2.65 | 0.18 | 1.63 | 0.09 | 2.80 | 0.21 | 2.99 | 0.20 | 1.82 | 0.08 | 2.84 | 0.21 | 2.59 | 0.14 | 1.57 | 0.08 |
| | SVM | 2.42 | 0.15 | 2.42 | 0.17 | 1.95 | 0.14 | 1.43 | 0.09 | 2.44 | 0.14 | 2.53 | 0.15 | 2.23 | 0.13 | 2.56 | 0.14 | 2.48 | 0.15 | 1.81 | 0.12 |
| 3 | OLS | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 | 10.00 | 0.45 |
| | AIC F | 9.59 | 0.46 | 9.59 | 0.42 | 9.61 | 0.45 | 9.59 | 0.46 | 9.58 | 0.45 | 9.54 | 0.45 | 9.37 | 0.45 | 9.59 | 0.44 | 9.53 | 0.46 | 9.38 | 0.46 |
| | BIC F | 9.11 | 0.41 | 9.10 | 0.42 | 9.12 | 0.41 | 9.11 | 0.41 | 9.11 | 0.41 | 9.10 | 0.41 | 9.09 | 0.41 | 9.13 | 0.41 | 9.10 | 0.41 | 9.08 | 0.41 |
| | AIC SF | 9.59 | 0.46 | 9.59 | 0.42 | 9.60 | 0.45 | 9.58 | 0.45 | 9.58 | 0.45 | 9.53 | 0.45 | 9.37 | 0.45 | 9.58 | 0.44 | 9.53 | 0.46 | 9.38 | 0.46 |
| | BIC SF | 9.11 | 0.41 | 9.10 | 0.42 | 9.12 | 0.41 | 9.11 | 0.41 | 9.11 | 0.41 | 9.10 | 0.41 | 9.09 | 0.41 | 9.13 | 0.41 | 9.10 | 0.41 | 9.08 | 0.41 |
| | Ridge | 11.07 | 0.54 | 11.28 | 0.56 | 12.00 | 0.71 | 13.67 | 0.66 | 11.29 | 0.54 | 11.86 | 0.67 | 13.13 | 0.71 | 11.29 | 0.68 | 11.96 | 0.71 | 13.56 | 0.73 |
| | Lasso | 9.49 | 0.45 | 9.50 | 0.46 | 9.52 | 0.48 | 9.54 | 0.42 | 9.51 | 0.44 | 9.57 | 0.45 | 9.59 | 0.44 | 9.52 | 0.48 | 9.53 | 0.50 | 9.53 | 0.44 |
| | E-net | 9.52 | 0.46 | 9.53 | 0.46 | 9.54 | 0.49 | 9.56 | 0.42 | 9.53 | 0.45 | 9.59 | 0.46 | 9.62 | 0.44 | 9.54 | 0.49 | 9.56 | 0.50 | 9.55 | 0.44 |
| | SCAD | 9.05 | 0.40 | 9.05 | 0.40 | 9.05 | 0.40 | 9.06 | 0.40 | 9.05 | 0.41 | 9.05 | 0.40 | 9.09 | 0.41 | 9.06 | 0.41 | 9.05 | 0.39 | 9.08 | 0.41 |
| | MCP | 9.05 | 0.40 | 9.05 | 0.40 | 9.06 | 0.40 | 9.06 | 0.40 | 9.05 | 0.41 | 9.05 | 0.39 | 9.09 | 0.41 | 9.06 | 0.41 | 9.05 | 0.39 | 9.08 | 0.41 |
| | XGBoost | 11.85 | 0.64 | 11.87 | 0.61 | 11.89 | 0.61 | 11.96 | 0.74 | 11.89 | 0.62 | 11.92 | 0.64 | 12.28 | 0.75 | 11.83 | 0.62 | 11.80 | 0.59 | 12.09 | 0.64 |
| | RF | 24.80 | 1.93 | 25.38 | 1.78 | 23.66 | 1.45 | 14.79 | 0.69 | 25.37 | 1.82 | 26.91 | 1.85 | 16.32 | 0.77 | 25.14 | 1.94 | 23.47 | 1.39 | 14.26 | 0.64 |
| | SVM | 21.78 | 1.35 | 21.74 | 1.54 | 17.65 | 1.28 | 12.96 | 0.77 | 22.00 | 1.14 | 22.72 | 1.38 | 20.11 | 1.13 | 22.84 | 1.49 | 22.27 | 1.44 | 16.41 | 0.91 |
| 6 | OLS | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 | 40.01 | 1.82 |
| | AIC F | 38.35 | 1.82 | 38.35 | 1.69 | 38.42 | 1.79 | 38.34 | 1.82 | 38.32 | 1.82 | 38.15 | 1.80 | 37.49 | 1.82 | 38.34 | 1.75 | 38.11 | 1.83 | 37.52 | 1.83 |
| | BIC F | 36.46 | 1.63 | 36.41 | 1.69 | 36.47 | 1.63 | 36.43 | 1.62 | 36.46 | 1.64 | 36.41 | 1.62 | 36.36 | 1.64 | 36.51 | 1.64 | 36.39 | 1.64 | 36.31 | 1.64 |
| | AIC SF | 38.35 | 1.82 | 38.35 | 1.69 | 38.41 | 1.79 | 38.33 | 1.82 | 38.32 | 1.82 | 38.14 | 1.79 | 37.49 | 1.81 | 38.33 | 1.75 | 38.11 | 1.82 | 37.51 | 1.83 |
| | BIC SF | 36.46 | 1.63 | 36.41 | 1.69 | 36.47 | 1.63 | 36.43 | 1.62 | 36.46 | 1.64 | 36.41 | 1.62 | 36.36 | 1.64 | 36.50 | 1.64 | 36.39 | 1.64 | 36.31 | 1.64 |
| | Ridge | 44.28 | 2.16 | 45.14 | 2.23 | 48.00 | 2.84 | 54.66 | 2.64 | 45.17 | 2.18 | 47.43 | 2.67 | 52.52 | 2.85 | 45.17 | 2.71 | 47.83 | 2.83 | 54.24 | 2.93 |
| | Lasso | 37.97 | 1.79 | 38.00 | 1.83 | 38.06 | 1.93 | 38.16 | 1.66 | 38.04 | 1.77 | 38.27 | 1.81 | 38.38 | 1.77 | 38.10 | 1.94 | 38.12 | 1.99 | 38.13 | 1.76 |
| | E-net | 38.07 | 1.84 | 38.11 | 1.85 | 38.15 | 1.95 | 38.24 | 1.68 | 38.14 | 1.78 | 38.38 | 1.82 | 38.46 | 1.77 | 38.17 | 1.96 | 38.23 | 1.99 | 38.21 | 1.76 |
| | SCAD | 36.21 | 1.59 | 36.22 | 1.60 | 36.21 | 1.59 | 36.26 | 1.61 | 36.20 | 1.64 | 36.22 | 1.58 | 36.34 | 1.65 | 36.23 | 1.62 | 36.21 | 1.58 | 36.30 | 1.64 |
| | MCP | 36.21 | 1.60 | 36.22 | 1.61 | 36.22 | 1.59 | 36.24 | 1.59 | 36.20 | 1.64 | 36.22 | 1.58 | 36.35 | 1.66 | 36.24 | 1.63 | 36.20 | 1.57 | 36.32 | 1.62 |
| | XGBoost | 47.39 | 2.56 | 47.50 | 2.42 | 47.56 | 2.45 | 47.85 | 2.96 | 47.58 | 2.48 | 47.68 | 2.58 | 48.83 | 2.97 | 47.32 | 2.48 | 47.18 | 2.36 | 48.47 | 2.81 |
| | RF | 99.19 | 7.73 | 101.52 | 7.11 | 94.67 | 5.82 | 59.16 | 2.74 | 101.49 | 7.30 | 107.66 | 7.45 | 65.28 | 3.08 | 100.55 | 7.76 | 93.89 | 5.55 | 57.07 | 2.58 |
| | SVM | 87.11 | 5.38 | 86.96 | 6.15 | 70.61 | 5.12 | 51.82 | 3.09 | 88.02 | 4.57 | 90.87 | 5.51 | 80.44 | 4.52 | 91.34 | 5.95 | 89.09 | 5.76 | 65.65 | 3.63 |

Table 18: Mean and standard deviation of the testing MSE for the linear simulations when $n = 1000$ and $p = 2000$. See Figure 18 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 16.02 | 0.72 | 13.43 | 0.71 | 9.13 | 0.46 | 2.81 | 0.13 | 15.24 | 0.73 | 13.09 | 0.67 | 6.76 | 0.32 | 13.72 | 0.64 | 9.35 | 0.44 | 2.96 | 0.13 |
| | Lasso | 1.08 | 0.05 | 1.09 | 0.05 | 1.08 | 0.05 | 1.09 | 0.06 | 1.08 | 0.05 | 1.09 | 0.05 | 1.17 | 0.06 | 1.09 | 0.06 | 1.08 | 0.05 | 1.10 | 0.05 |
| | E-net | 1.09 | 0.05 | 1.09 | 0.05 | 1.09 | 0.05 | 1.10 | 0.06 | 1.09 | 0.05 | 1.10 | 0.05 | 1.18 | 0.06 | 1.09 | 0.06 | 1.09 | 0.05 | 1.11 | 0.06 |
| | SCAD | 1.01 | 0.04 | 1.01 | 0.04 | 1.03 | 0.05 | 1.05 | 0.10 | 1.01 | 0.04 | 1.01 | 0.04 | 1.06 | 0.10 | 1.01 | 0.04 | 1.02 | 0.05 | 1.04 | 0.04 |
| | MCP | 1.01 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.04 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.05 | 0.04 | 1.01 | 0.04 | 1.01 | 0.04 | 1.04 | 0.04 |
| | XGBoost | 1.42 | 0.08 | 1.44 | 0.07 | 1.45 | 0.08 | 1.48 | 0.08 | 1.42 | 0.07 | 1.46 | 0.08 | 1.70 | 0.10 | 1.42 | 0.08 | 1.44 | 0.09 | 1.56 | 0.08 |
| | RF | 3.62 | 0.26 | 3.86 | 0.27 | 3.40 | 0.22 | 1.89 | 0.10 | 3.64 | 0.24 | 3.89 | 0.25 | 1.92 | 0.10 | 3.69 | 0.28 | 3.35 | 0.20 | 1.79 | 0.08 |
| | SVM | 14.80 | 0.66 | 12.24 | 0.60 | 7.98 | 0.39 | 2.56 | 0.14 | 13.98 | 0.61 | 11.79 | 0.57 | 5.46 | 0.25 | 12.59 | 0.58 | 8.82 | 0.40 | 3.71 | 0.18 |
| 3 | Ridge | 144.14 | 6.47 | 120.54 | 5.17 | 82.87 | 4.01 | 25.16 | 1.14 | 137.01 | 6.46 | 117.91 | 6.16 | 60.80 | 3.01 | 124.21 | 6.22 | 85.45 | 3.89 | 26.35 | 1.29 |
| | Lasso | 9.75 | 0.46 | 9.72 | 0.47 | 9.72 | 0.48 | 9.85 | 0.47 | 9.74 | 0.45 | 9.86 | 0.49 | 10.51 | 0.56 | 9.76 | 0.49 | 9.84 | 0.50 | 9.87 | 0.48 |
| | E-net | 9.81 | 0.46 | 9.78 | 0.47 | 9.77 | 0.48 | 9.94 | 0.47 | 9.82 | 0.47 | 9.95 | 0.50 | 10.65 | 0.56 | 9.82 | 0.50 | 9.91 | 0.51 | 9.95 | 0.49 |
| | SCAD | 9.07 | 0.37 | 9.08 | 0.40 | 9.24 | 0.44 | 9.54 | 1.17 | 9.08 | 0.39 | 9.11 | 0.38 | 9.54 | 0.86 | 9.09 | 0.39 | 9.24 | 0.45 | 9.39 | 0.82 |
| | MCP | 9.05 | 0.37 | 9.05 | 0.39 | 9.07 | 0.39 | 9.35 | 0.40 | 9.05 | 0.39 | 9.05 | 0.38 | 9.42 | 0.38 | 9.06 | 0.38 | 9.07 | 0.39 | 9.32 | 0.39 |
| | XGBoost | 12.77 | 0.68 | 12.82 | 0.68 | 13.06 | 0.73 | 13.25 | 0.65 | 12.78 | 0.54 | 13.19 | 0.72 | 15.22 | 0.88 | 12.87 | 0.71 | 13.07 | 0.74 | 13.86 | 0.67 |
| | RF | 32.62 | 2.32 | 33.79 | 2.41 | 30.43 | 1.97 | 16.83 | 0.82 | 32.76 | 2.23 | 35.04 | 2.26 | 17.35 | 0.88 | 33.63 | 2.42 | 30.35 | 1.77 | 15.90 | 0.74 |
| | SVM | 133.24 | 5.90 | 109.90 | 4.45 | 72.46 | 3.28 | 22.81 | 1.06 | 125.71 | 5.40 | 106.06 | 5.17 | 49.15 | 2.38 | 114.38 | 5.38 | 80.51 | 3.58 | 32.75 | 1.54 |
| 6 | Ridge | 576.56 | 25.87 | 482.14 | 20.69 | 331.47 | 16.05 | 100.64 | 4.58 | 548.28 | 25.71 | 471.63 | 24.65 | 243.21 | 12.05 | 496.84 | 24.88 | 341.80 | 15.58 | 105.42 | 5.15 |
| | Lasso | 38.98 | 1.82 | 38.89 | 1.88 | 38.87 | 1.91 | 39.38 | 1.86 | 39.00 | 1.81 | 39.44 | 1.95 | 42.06 | 2.23 | 39.03 | 1.96 | 39.34 | 1.99 | 39.48 | 1.93 |
| | E-net | 39.24 | 1.84 | 39.13 | 1.90 | 39.09 | 1.94 | 39.74 | 1.90 | 39.26 | 1.83 | 39.81 | 1.98 | 42.60 | 2.24 | 39.29 | 2.00 | 39.63 | 2.04 | 39.80 | 1.95 |
| | SCAD | 36.27 | 1.49 | 36.32 | 1.58 | 36.95 | 1.76 | 38.16 | 4.69 | 36.31 | 1.58 | 36.45 | 1.53 | 38.16 | 3.44 | 36.35 | 1.54 | 36.96 | 1.82 | 37.55 | 3.27 |
| | MCP | 36.19 | 1.49 | 36.19 | 1.55 | 36.30 | 1.56 | 37.39 | 1.62 | 36.21 | 1.55 | 36.19 | 1.51 | 37.69 | 1.53 | 36.23 | 1.51 | 36.26 | 1.55 | 37.29 | 1.57 |
| | XGBoost | 51.08 | 2.73 | 51.24 | 2.72 | 52.21 | 2.96 | 52.85 | 2.67 | 51.44 | 2.71 | 52.78 | 2.88 | 60.95 | 3.75 | 51.48 | 2.83 | 52.20 | 2.85 | 55.40 | 2.96 |
| | RF | 130.46 | 9.29 | 135.14 | 9.66 | 121.75 | 7.87 | 67.30 | 3.26 | 130.90 | 8.92 | 140.14 | 9.02 | 69.44 | 3.53 | 134.46 | 9.61 | 121.42 | 7.05 | 63.58 | 2.97 |
| | SVM | 532.95 | 23.61 | 439.60 | 17.79 | 289.85 | 13.10 | 91.22 | 4.25 | 502.81 | 21.47 | 424.26 | 20.66 | 196.59 | 9.51 | 457.51 | 21.50 | 322.04 | 14.34 | 131.03 | 6.13 |

## 4.3 Tables for the $\beta$-sensitivity of the linear simulations

Table 19: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 50$ and $p = 10$. See Figure 19 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | AIC B | 0.998 | 0.0200 | 0.990 | 0.0438 | 0.978 | 0.0629 | 0.892 | 0.1002 | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.876 | 0.1016 | 0.992 | 0.0394 | 0.972 | 0.0697 | 0.886 | 0.0995 |
| | BIC B | 0.990 | 0.0438 | 0.974 | 0.0676 | 0.956 | 0.0833 | 0.854 | 0.0937 | 0.986 | 0.0513 | 0.962 | 0.0789 | 0.840 | 0.0899 | 0.986 | 0.0513 | 0.952 | 0.0858 | 0.848 | 0.0858 |
| | AIC SB | 0.998 | 0.0200 | 0.990 | 0.0438 | 0.978 | 0.0629 | 0.892 | 0.1002 | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.874 | 0.1011 | 0.992 | 0.0394 | 0.972 | 0.0697 | 0.886 | 0.0995 |
| | BIC SB | 0.990 | 0.0438 | 0.974 | 0.0676 | 0.956 | 0.0833 | 0.854 | 0.0937 | 0.986 | 0.0513 | 0.962 | 0.0789 | 0.840 | 0.0899 | 0.986 | 0.0513 | 0.952 | 0.0858 | 0.848 | 0.0858 |
| | AIC F | 0.998 | 0.0200 | 0.986 | 0.0513 | 0.974 | 0.0676 | 0.886 | 0.0995 | 0.992 | 0.0394 | 0.980 | 0.0603 | 0.832 | 0.1626 | 0.992 | 0.0394 | 0.970 | 0.0718 | 0.872 | 0.1190 |
| | BIC F | 0.990 | 0.0438 | 0.970 | 0.0718 | 0.950 | 0.0870 | 0.844 | 0.1008 | 0.986 | 0.0513 | 0.962 | 0.0789 | 0.730 | 0.1997 | 0.986 | 0.0513 | 0.950 | 0.0870 | 0.816 | 0.1496 |
| | AIC SF | 0.998 | 0.0200 | 0.986 | 0.0513 | 0.974 | 0.0676 | 0.886 | 0.0995 | 0.992 | 0.0394 | 0.980 | 0.0603 | 0.828 | 0.1609 | 0.992 | 0.0394 | 0.970 | 0.0718 | 0.870 | 0.1185 |
| | BIC SF | 0.990 | 0.0438 | 0.970 | 0.0718 | 0.950 | 0.0870 | 0.844 | 0.1008 | 0.986 | 0.0513 | 0.962 | 0.0789 | 0.728 | 0.1980 | 0.986 | 0.0513 | 0.950 | 0.0870 | 0.816 | 0.1496 |
| | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.990 | 0.0438 | 0.984 | 0.0545 | 0.974 | 0.0676 | 0.834 | 0.1506 | 0.992 | 0.0394 | 0.984 | 0.0545 | 0.872 | 0.1408 | 0.980 | 0.0603 | 0.952 | 0.0858 | 0.838 | 0.1229 |
| | E-net | 0.992 | 0.0394 | 0.988 | 0.0477 | 0.984 | 0.0545 | 0.854 | 0.1417 | 0.994 | 0.0343 | 0.992 | 0.0394 | 0.904 | 0.1154 | 0.988 | 0.0477 | 0.954 | 0.0846 | 0.844 | 0.1225 |
| | SCAD | 0.976 | 0.0653 | 0.970 | 0.0718 | 0.946 | 0.0892 | 0.846 | 0.1019 | 0.978 | 0.0629 | 0.942 | 0.0912 | 0.836 | 0.0916 | 0.976 | 0.0653 | 0.944 | 0.0903 | 0.856 | 0.0903 |
| | MCP | 0.972 | 0.0697 | 0.968 | 0.0737 | 0.936 | 0.0938 | 0.844 | 0.1085 | 0.976 | 0.0653 | 0.938 | 0.0930 | 0.832 | 0.0886 | 0.972 | 0.0697 | 0.942 | 0.0912 | 0.850 | 0.0916 |
| 3 | OLS | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | AIC B | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.996 | 0.0281 | 0.970 | 0.0718 | 0.866 | 0.0945 | 0.986 | 0.0513 | 0.978 | 0.0629 | 0.910 | 0.1040 |
| | BIC B | 0.990 | 0.0438 | 0.972 | 0.0697 | 0.960 | 0.0804 | 0.860 | 0.0921 | 0.986 | 0.0513 | 0.948 | 0.0882 | 0.842 | 0.0867 | 0.978 | 0.0629 | 0.952 | 0.0858 | 0.872 | 0.1006 |
| | AIC SB | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.996 | 0.0281 | 0.970 | 0.0718 | 0.868 | 0.0952 | 0.986 | 0.0513 | 0.978 | 0.0629 | 0.910 | 0.1040 |
| | BIC SB | 0.990 | 0.0438 | 0.972 | 0.0697 | 0.960 | 0.0804 | 0.860 | 0.0921 | 0.986 | 0.0513 | 0.950 | 0.0870 | 0.842 | 0.0867 | 0.978 | 0.0629 | 0.952 | 0.0858 | 0.872 | 0.1006 |
| | AIC F | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.994 | 0.0343 | 0.972 | 0.0697 | 0.858 | 0.1342 | 0.988 | 0.0477 | 0.974 | 0.0676 | 0.902 | 0.1155 |
| | BIC F | 0.990 | 0.0438 | 0.970 | 0.0718 | 0.958 | 0.0819 | 0.832 | 0.1162 | 0.982 | 0.0575 | 0.948 | 0.0882 | 0.718 | 0.2148 | 0.978 | 0.0629 | 0.948 | 0.0882 | 0.840 | 0.1477 |
| | AIC SF | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.994 | 0.0343 | 0.972 | 0.0697 | 0.854 | 0.1329 | 0.988 | 0.0477 | 0.972 | 0.0697 | 0.902 | 0.1155 |
| | BIC SF | 0.990 | 0.0438 | 0.970 | 0.0718 | 0.958 | 0.0819 | 0.832 | 0.1162 | 0.982 | 0.0575 | 0.948 | 0.0882 | 0.718 | 0.2148 | 0.978 | 0.0629 | 0.948 | 0.0882 | 0.840 | 0.1477 |
| | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.990 | 0.0438 | 0.984 | 0.0545 | 0.972 | 0.0697 | 0.878 | 0.1360 | 0.992 | 0.0394 | 0.988 | 0.0477 | 0.890 | 0.1314 | 0.968 | 0.0737 | 0.962 | 0.0789 | 0.856 | 0.1336 |
| | E-net | 0.992 | 0.0394 | 0.986 | 0.0513 | 0.976 | 0.0653 | 0.896 | 0.1188 | 0.994 | 0.0343 | 0.990 | 0.0438 | 0.908 | 0.1285 | 0.972 | 0.0697 | 0.972 | 0.0697 | 0.870 | 0.1283 |
| | SCAD | 0.976 | 0.0653 | 0.960 | 0.0804 | 0.928 | 0.0965 | 0.868 | 0.1072 | 0.976 | 0.0653 | 0.940 | 0.0921 | 0.846 | 0.1058 | 0.966 | 0.0755 | 0.930 | 0.0959 | 0.862 | 0.0972 |
| | MCP | 0.972 | 0.0697 | 0.956 | 0.0833 | 0.926 | 0.0970 | 0.866 | 0.1066 | 0.968 | 0.0737 | 0.922 | 0.0980 | 0.836 | 0.1040 | 0.958 | 0.0819 | 0.918 | 0.0989 | 0.856 | 0.0988 |
| 6 | OLS | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | AIC B | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.996 | 0.0281 | 0.970 | 0.0718 | 0.866 | 0.0945 | 0.986 | 0.0513 | 0.978 | 0.0629 | 0.910 | 0.1040 |
| | BIC B | 0.990 | 0.0438 | 0.972 | 0.0697 | 0.960 | 0.0804 | 0.860 | 0.0921 | 0.986 | 0.0513 | 0.948 | 0.0882 | 0.842 | 0.0867 | 0.978 | 0.0629 | 0.952 | 0.0858 | 0.872 | 0.1006 |
| | AIC SB | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.996 | 0.0281 | 0.970 | 0.0718 | 0.868 | 0.0952 | 0.986 | 0.0513 | 0.978 | 0.0629 | 0.910 | 0.1040 |
| | BIC SB | 0.990 | 0.0438 | 0.972 | 0.0697 | 0.960 | 0.0804 | 0.860 | 0.0921 | 0.986 | 0.0513 | 0.950 | 0.0870 | 0.842 | 0.0867 | 0.978 | 0.0629 | 0.952 | 0.0858 | 0.872 | 0.1006 |
| | AIC F | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.994 | 0.0343 | 0.972 | 0.0697 | 0.858 | 0.1342 | 0.988 | 0.0477 | 0.974 | 0.0676 | 0.902 | 0.1155 |
| | BIC F | 0.990 | 0.0438 | 0.970 | 0.0718 | 0.958 | 0.0819 | 0.832 | 0.1162 | 0.982 | 0.0575 | 0.948 | 0.0882 | 0.718 | 0.2148 | 0.978 | 0.0629 | 0.948 | 0.0882 | 0.840 | 0.1477 |
| | AIC SF | 0.998 | 0.0200 | 0.980 | 0.0603 | 0.978 | 0.0629 | 0.898 | 0.1005 | 0.994 | 0.0343 | 0.972 | 0.0697 | 0.854 | 0.1329 | 0.988 | 0.0477 | 0.972 | 0.0697 | 0.902 | 0.1155 |
| | BIC SF | 0.990 | 0.0438 | 0.970 | 0.0718 | 0.958 | 0.0819 | 0.832 | 0.1162 | 0.982 | 0.0575 | 0.948 | 0.0882 | 0.718 | 0.2148 | 0.978 | 0.0629 | 0.948 | 0.0882 | 0.840 | 0.1477 |
| | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.990 | 0.0438 | 0.984 | 0.0545 | 0.972 | 0.0697 | 0.878 | 0.1360 | 0.992 | 0.0394 | 0.988 | 0.0477 | 0.890 | 0.1314 | 0.968 | 0.0737 | 0.962 | 0.0789 | 0.856 | 0.1336 |
| | E-net | 0.992 | 0.0394 | 0.986 | 0.0513 | 0.976 | 0.0653 | 0.896 | 0.1188 | 0.994 | 0.0343 | 0.990 | 0.0438 | 0.908 | 0.1285 | 0.972 | 0.0697 | 0.972 | 0.0697 | 0.870 | 0.1283 |
| | SCAD | 0.976 | 0.0653 | 0.960 | 0.0804 | 0.928 | 0.0965 | 0.868 | 0.1072 | 0.976 | 0.0653 | 0.940 | 0.0921 | 0.846 | 0.1058 | 0.966 | 0.0755 | 0.930 | 0.0959 | 0.862 | 0.0972 |
| | MCP | 0.972 | 0.0697 | 0.956 | 0.0833 | 0.926 | 0.0970 | 0.866 | 0.1066 | 0.968 | 0.0737 | 0.922 | 0.0980 | 0.836 | 0.1040 | 0.958 | 0.0819 | 0.918 | 0.0989 | 0.856 | 0.0988 |

Table 20: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 50$ and $p = 100$. See Figure 20 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.936 | 0.0938 | 0.936 | 0.0938 | 0.912 | 0.0998 | 0.694 | 0.1347 | 0.948 | 0.0882 | 0.958 | 0.0819 | 0.614 | 0.1664 | 0.946 | 0.0892 | 0.922 | 0.1021 | 0.702 | 0.1620 |
| | E-net | 0.938 | 0.0930 | 0.940 | 0.0921 | 0.912 | 0.0998 | 0.710 | 0.1283 | 0.958 | 0.0819 | 0.968 | 0.0737 | 0.716 | 0.1339 | 0.956 | 0.0833 | 0.928 | 0.1006 | 0.744 | 0.1506 |
| | SCAD | 0.948 | 0.0882 | 0.948 | 0.0882 | 0.886 | 0.0995 | 0.610 | 0.1738 | 0.934 | 0.0945 | 0.890 | 0.1000 | 0.504 | 0.1595 | 0.938 | 0.0930 | 0.874 | 0.0970 | 0.612 | 0.1903 |
| | MCP | 0.934 | 0.0945 | 0.926 | 0.0970 | 0.864 | 0.0938 | 0.610 | 0.1872 | 0.912 | 0.0998 | 0.876 | 0.0976 | 0.488 | 0.1486 | 0.916 | 0.0992 | 0.842 | 0.0819 | 0.618 | 0.1888 |
| 3 | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.936 | 0.0938 | 0.926 | 0.0970 | 0.906 | 0.1003 | 0.736 | 0.1630 | 0.956 | 0.0833 | 0.954 | 0.0979 | 0.622 | 0.1580 | 0.934 | 0.0945 | 0.914 | 0.1073 | 0.716 | 0.1454 |
| | E-net | 0.938 | 0.0930 | 0.922 | 0.0980 | 0.908 | 0.1002 | 0.746 | 0.1527 | 0.964 | 0.0772 | 0.960 | 0.0943 | 0.710 | 0.1374 | 0.932 | 0.0952 | 0.920 | 0.1064 | 0.738 | 0.1469 |
| | SCAD | 0.948 | 0.0882 | 0.934 | 0.0945 | 0.876 | 0.0976 | 0.630 | 0.1894 | 0.940 | 0.0921 | 0.896 | 0.1004 | 0.498 | 0.1544 | 0.930 | 0.0959 | 0.868 | 0.0952 | 0.624 | 0.1892 |
| | MCP | 0.934 | 0.0945 | 0.908 | 0.1002 | 0.850 | 0.0870 | 0.616 | 0.1963 | 0.932 | 0.0952 | 0.872 | 0.0965 | 0.478 | 0.1474 | 0.900 | 0.1005 | 0.842 | 0.0819 | 0.630 | 0.1894 |
| 6 | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.936 | 0.0938 | 0.926 | 0.0970 | 0.906 | 0.1003 | 0.736 | 0.1630 | 0.956 | 0.0833 | 0.954 | 0.0979 | 0.622 | 0.1580 | 0.934 | 0.0945 | 0.914 | 0.1073 | 0.716 | 0.1454 |
| | E-net | 0.938 | 0.0930 | 0.922 | 0.0980 | 0.908 | 0.1002 | 0.746 | 0.1527 | 0.964 | 0.0772 | 0.960 | 0.0943 | 0.710 | 0.1374 | 0.932 | 0.0952 | 0.920 | 0.1064 | 0.738 | 0.1469 |
| | SCAD | 0.948 | 0.0882 | 0.934 | 0.0945 | 0.876 | 0.0976 | 0.630 | 0.1894 | 0.940 | 0.0921 | 0.896 | 0.1004 | 0.498 | 0.1544 | 0.930 | 0.0959 | 0.868 | 0.0952 | 0.624 | 0.1892 |
| | MCP | 0.934 | 0.0945 | 0.908 | 0.1002 | 0.850 | 0.0870 | 0.616 | 0.1963 | 0.932 | 0.0952 | 0.872 | 0.0965 | 0.478 | 0.1474 | 0.900 | 0.1005 | 0.842 | 0.0819 | 0.630 | 0.1894 |

Table 21: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 50$ and $p = 2000$. See Figure 21 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.816 | 0.0972 | 0.798 | 0.1463 | 0.754 | 0.1298 | 0.538 | 0.1162 | 0.796 | 0.1928 | 0.558 | 0.2016 | 0.550 | 0.1514 | 0.754 | 0.1726 | 0.636 | 0.1185 | 0.606 | 0.0722 |
| | E-net | 0.792 | 0.1061 | 0.776 | 0.1512 | 0.750 | 0.1219 | 0.556 | 0.1157 | 0.784 | 0.1942 | 0.558 | 0.2016 | 0.668 | 0.1246 | 0.736 | 0.1703 | 0.636 | 0.1115 | 0.632 | 0.0886 |
| | SCAD | 0.894 | 0.1003 | 0.898 | 0.1005 | 0.842 | 0.0912 | 0.466 | 0.1451 | 0.902 | 0.1005 | 0.746 | 0.1772 | 0.412 | 0.0477 | 0.892 | 0.1116 | 0.806 | 0.1003 | 0.412 | 0.0686 |
| | MCP | 0.864 | 0.0938 | 0.860 | 0.0921 | 0.794 | 0.0874 | 0.454 | 0.1388 | 0.862 | 0.1162 | 0.648 | 0.1972 | 0.410 | 0.0438 | 0.840 | 0.0943 | 0.748 | 0.1382 | 0.406 | 0.0528 |
| 3 | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.816 | 0.0972 | 0.794 | 0.1434 | 0.732 | 0.1399 | 0.534 | 0.1241 | 0.788 | 0.1838 | 0.534 | 0.1799 | 0.544 | 0.1479 | 0.788 | 0.1297 | 0.646 | 0.1096 | 0.610 | 0.0916 |
| | E-net | 0.792 | 0.1061 | 0.784 | 0.1441 | 0.716 | 0.1369 | 0.542 | 0.1216 | 0.766 | 0.1950 | 0.528 | 0.1875 | 0.668 | 0.1309 | 0.772 | 0.1334 | 0.640 | 0.0899 | 0.642 | 0.0955 |
| | SCAD | 0.894 | 0.1003 | 0.872 | 0.0965 | 0.840 | 0.0804 | 0.470 | 0.1460 | 0.888 | 0.0998 | 0.750 | 0.1714 | 0.410 | 0.0438 | 0.882 | 0.0989 | 0.800 | 0.1064 | 0.414 | 0.0586 |
| | MCP | 0.864 | 0.0938 | 0.842 | 0.0819 | 0.794 | 0.0827 | 0.448 | 0.1425 | 0.866 | 0.0945 | 0.694 | 0.1852 | 0.408 | 0.0394 | 0.850 | 0.0870 | 0.756 | 0.1351 | 0.404 | 0.0400 |
| 6 | Ridge | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 0.816 | 0.0972 | 0.794 | 0.1434 | 0.732 | 0.1399 | 0.534 | 0.1241 | 0.780 | 0.1959 | 0.534 | 0.1799 | 0.544 | 0.1479 | 0.788 | 0.1297 | 0.646 | 0.1096 | 0.610 | 0.0916 |
| | E-net | 0.792 | 0.1061 | 0.784 | 0.1441 | 0.716 | 0.1369 | 0.542 | 0.1216 | 0.754 | 0.2047 | 0.528 | 0.1875 | 0.668 | 0.1309 | 0.772 | 0.1334 | 0.640 | 0.0899 | 0.642 | 0.0955 |
| | SCAD | 0.894 | 0.1003 | 0.872 | 0.0965 | 0.840 | 0.0804 | 0.470 | 0.1460 | 0.900 | 0.1005 | 0.750 | 0.1714 | 0.410 | 0.0438 | 0.882 | 0.0989 | 0.800 | 0.1064 | 0.414 | 0.0586 |
| | MCP | 0.864 | 0.0938 | 0.842 | 0.0819 | 0.794 | 0.0827 | 0.448 | 0.1425 | 0.864 | 0.1059 | 0.694 | 0.1852 | 0.408 | 0.0394 | 0.850 | 0.0870 | 0.756 | 0.1351 | 0.404 | 0.0400 |

Table 22: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 200$ and $p = 10$. See Figure 22 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC B | 1 | 0 | 1 | 0 | 1 | 0 | 0.960 | 0.0804 | 1 | 0 | 1.000 | 0.00 | 0.976 | 0.0653 | 1 | 0 | 1 | 0 | 0.978 | 0.0629 |
| | BIC B | 1 | 0 | 1 | 0 | 1 | 0 | 0.918 | 0.0989 | 1 | 0 | 1.000 | 0.00 | 0.930 | 0.0959 | 1 | 0 | 1 | 0 | 0.938 | 0.0930 |
| | AIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 0.960 | 0.0804 | 1 | 0 | 1.000 | 0.00 | 0.976 | 0.0653 | 1 | 0 | 1 | 0 | 0.978 | 0.0629 |
| | BIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 0.918 | 0.0989 | 1 | 0 | 1.000 | 0.00 | 0.930 | 0.0959 | 1 | 0 | 1 | 0 | 0.940 | 0.0921 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.958 | 0.0819 | 1 | 0 | 1.000 | 0.00 | 0.972 | 0.0697 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.914 | 0.0995 | 1 | 0 | 1.000 | 0.00 | 0.932 | 0.0952 | 1 | 0 | 1 | 0 | 0.938 | 0.0930 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.958 | 0.0819 | 1 | 0 | 1.000 | 0.00 | 0.972 | 0.0697 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.914 | 0.0995 | 1 | 0 | 1.000 | 0.00 | 0.932 | 0.0952 | 1 | 0 | 1 | 0 | 0.938 | 0.0930 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.968 | 0.0737 | 1 | 0 | 1.000 | 0.00 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.938 | 0.0930 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 | 1 | 0 | 1.000 | 0.00 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 0.954 | 0.0846 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.920 | 0.0985 | 1 | 0 | 1.000 | 0.00 | 0.930 | 0.0959 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.914 | 0.0995 | 1 | 0 | 1.000 | 0.00 | 0.930 | 0.0959 | 1 | 0 | 1 | 0 | 0.926 | 0.0970 |
| 3 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC B | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.980 | 0.0603 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 |
| | BIC B | 1 | 0 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 | 1 | 0 | 0.998 | 0.02 | 0.934 | 0.0945 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | AIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.980 | 0.0603 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 |
| | BIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 | 1 | 0 | 0.998 | 0.02 | 0.934 | 0.0945 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.978 | 0.0629 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.920 | 0.0985 | 1 | 0 | 0.998 | 0.02 | 0.936 | 0.0938 | 1 | 0 | 1 | 0 | 0.926 | 0.0970 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.978 | 0.0629 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.920 | 0.0985 | 1 | 0 | 0.998 | 0.02 | 0.936 | 0.0938 | 1 | 0 | 1 | 0 | 0.926 | 0.0970 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.954 | 0.0846 | 1 | 0 | 1.000 | 0.00 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 | 1 | 0 | 1.000 | 0.00 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.944 | 0.0903 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 | 1 | 0 | 1.000 | 0.00 | 0.936 | 0.0938 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 | 1 | 0 | 1.000 | 0.00 | 0.932 | 0.0952 | 1 | 0 | 1 | 0 | 0.932 | 0.0952 |
| 6 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC B | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.980 | 0.0603 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 |
| | BIC B | 1 | 0 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 | 1 | 0 | 0.998 | 0.02 | 0.934 | 0.0945 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | AIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.980 | 0.0603 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 |
| | BIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 | 1 | 0 | 0.998 | 0.02 | 0.934 | 0.0945 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.978 | 0.0629 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.920 | 0.0985 | 1 | 0 | 0.998 | 0.02 | 0.936 | 0.0938 | 1 | 0 | 1 | 0 | 0.926 | 0.0970 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 | 1 | 0 | 1.000 | 0.00 | 0.978 | 0.0629 | 1 | 0 | 1 | 0 | 0.970 | 0.0718 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.920 | 0.0985 | 1 | 0 | 0.998 | 0.02 | 0.936 | 0.0938 | 1 | 0 | 1 | 0 | 0.926 | 0.0970 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.954 | 0.0846 | 1 | 0 | 1.000 | 0.00 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 0.972 | 0.0697 | 1 | 0 | 1.000 | 0.00 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.944 | 0.0903 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 | 1 | 0 | 1.000 | 0.00 | 0.936 | 0.0938 | 1 | 0 | 1 | 0 | 0.930 | 0.0959 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.924 | 0.0976 | 1 | 0 | 1.000 | 0.00 | 0.932 | 0.0952 | 1 | 0 | 1 | 0 | 0.932 | 0.0952 |

Table 23: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 200$ and $p = 100$. See Figure 23 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | AIC F | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.952 | 0.0858 | 1 | 0 | 1.000 | 0.0000 | 0.966 | 0.0755 | 1 | 0 | 1.000 | 0.0000 | 0.954 | 0.0846 |
| | BIC F | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.880 | 0.0985 | 1 | 0 | 1.000 | 0.0000 | 0.920 | 0.1101 | 1 | 0 | 1.000 | 0.0000 | 0.920 | 0.0985 |
| | AIC SF | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.950 | 0.0870 | 1 | 0 | 1.000 | 0.0000 | 0.960 | 0.0804 | 1 | 0 | 0.998 | 0.0200 | 0.950 | 0.0870 |
| | BIC SF | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.880 | 0.0985 | 1 | 0 | 1.000 | 0.0000 | 0.920 | 0.1101 | 1 | 0 | 1.000 | 0.0000 | 0.920 | 0.0985 |
| | Ridge | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.904 | 0.1004 | 1 | 0 | 1.000 | 0.0000 | 0.972 | 0.0697 | 1 | 0 | 1.000 | 0.0000 | 0.940 | 0.0921 |
| | E-net | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.916 | 0.0992 | 1 | 0 | 1.000 | 0.0000 | 0.980 | 0.0603 | 1 | 0 | 1.000 | 0.0000 | 0.948 | 0.0882 |
| | SCAD | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.826 | 0.0676 | 1 | 0 | 0.994 | 0.0343 | 0.832 | 0.0737 | 1 | 0 | 0.996 | 0.0281 | 0.842 | 0.0819 |
| | MCP | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 0.828 | 0.0697 | 1 | 0 | 0.996 | 0.0281 | 0.820 | 0.0603 | 1 | 0 | 0.996 | 0.0281 | 0.834 | 0.0755 |
| 3 | OLS | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | AIC F | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.960 | 0.0804 | 1 | 0 | 1.000 | 0.0000 | 0.962 | 0.0789 | 1 | 0 | 1.000 | 0.0000 | 0.946 | 0.0892 |
| | BIC F | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.898 | 0.1005 | 1 | 0 | 1.000 | 0.0000 | 0.924 | 0.1093 | 1 | 0 | 1.000 | 0.0000 | 0.900 | 0.1005 |
| | AIC SF | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.958 | 0.0819 | 1 | 0 | 1.000 | 0.0000 | 0.962 | 0.0789 | 1 | 0 | 1.000 | 0.0000 | 0.942 | 0.0912 |
| | BIC SF | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.896 | 0.1004 | 1 | 0 | 1.000 | 0.0000 | 0.922 | 0.1097 | 1 | 0 | 1.000 | 0.0000 | 0.900 | 0.1005 |
| | Ridge | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 0.910 | 0.1000 | 1 | 0 | 1.000 | 0.0000 | 0.972 | 0.0697 | 1 | 0 | 1.000 | 0.0000 | 0.914 | 0.0995 |
| | E-net | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.922 | 0.0980 | 1 | 0 | 1.000 | 0.0000 | 0.984 | 0.0545 | 1 | 0 | 1.000 | 0.0000 | 0.926 | 0.0970 |
| | SCAD | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.834 | 0.0755 | 1 | 0 | 0.998 | 0.0200 | 0.828 | 0.0697 | 1 | 0 | 0.994 | 0.0343 | 0.836 | 0.0772 |
| | MCP | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 0.836 | 0.0772 | 1 | 0 | 0.998 | 0.0200 | 0.816 | 0.0545 | 1 | 0 | 0.994 | 0.0343 | 0.834 | 0.0755 |
| 6 | OLS | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | AIC F | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.960 | 0.0804 | 1 | 0 | 1.000 | 0.0000 | 0.962 | 0.0789 | 1 | 0 | 1.000 | 0.0000 | 0.946 | 0.0892 |
| | BIC F | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.898 | 0.1005 | 1 | 0 | 1.000 | 0.0000 | 0.924 | 0.1093 | 1 | 0 | 1.000 | 0.0000 | 0.900 | 0.1005 |
| | AIC SF | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.958 | 0.0819 | 1 | 0 | 1.000 | 0.0000 | 0.962 | 0.0789 | 1 | 0 | 1.000 | 0.0000 | 0.942 | 0.0912 |
| | BIC SF | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.896 | 0.1004 | 1 | 0 | 1.000 | 0.0000 | 0.922 | 0.1097 | 1 | 0 | 1.000 | 0.0000 | 0.900 | 0.1005 |
| | Ridge | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 0.910 | 0.1000 | 1 | 0 | 1.000 | 0.0000 | 0.972 | 0.0697 | 1 | 0 | 1.000 | 0.0000 | 0.914 | 0.0995 |
| | E-net | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.922 | 0.0980 | 1 | 0 | 1.000 | 0.0000 | 0.984 | 0.0545 | 1 | 0 | 1.000 | 0.0000 | 0.926 | 0.0970 |
| | SCAD | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 0.834 | 0.0755 | 1 | 0 | 0.998 | 0.0200 | 0.828 | 0.0697 | 1 | 0 | 0.994 | 0.0343 | 0.836 | 0.0772 |
| | MCP | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 0.836 | 0.0772 | 1 | 0 | 0.998 | 0.0200 | 0.816 | 0.0545 | 1 | 0 | 0.994 | 0.0343 | 0.834 | 0.0755 |

Table 24: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 200$ and $p = 2000$. See Figure 24 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.00 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 0.996 | 0.0281 | 0.990 | 0.0438 | 0.848 | 0.0904 | 0.998 | 0.0200 | 0.998 | 0.0200 | 0.674 | 0.1050 | 1.000 | 0.00 | 0.994 | 0.0343 | 0.806 | 0.1406 |
| | E-net | 1 | 0 | 0.996 | 0.0281 | 0.990 | 0.0438 | 0.858 | 0.0955 | 0.998 | 0.0200 | 1.000 | 0.0000 | 0.782 | 0.0642 | 1.000 | 0.00 | 0.996 | 0.0281 | 0.820 | 0.1407 |
| | SCAD | 1 | 0 | 0.996 | 0.0281 | 0.986 | 0.0513 | 0.770 | 0.0772 | 0.996 | 0.0281 | 0.992 | 0.0394 | 0.656 | 0.1635 | 1.000 | 0.00 | 0.966 | 0.0755 | 0.750 | 0.1251 |
| | MCP | 1 | 0 | 0.996 | 0.0281 | 0.972 | 0.0697 | 0.792 | 0.0486 | 0.996 | 0.0281 | 0.992 | 0.0394 | 0.714 | 0.1484 | 1.000 | 0.00 | 0.968 | 0.0737 | 0.772 | 0.1026 |
| 3 | Ridge | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.00 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 0.998 | 0.0200 | 0.994 | 0.0343 | 0.836 | 0.0916 | 0.998 | 0.0200 | 0.998 | 0.0200 | 0.670 | 0.1000 | 0.998 | 0.02 | 0.994 | 0.0343 | 0.826 | 0.1440 |
| | E-net | 1 | 0 | 1.000 | 0.0000 | 0.994 | 0.0343 | 0.844 | 0.0925 | 0.998 | 0.0200 | 1.000 | 0.0000 | 0.784 | 0.0615 | 0.998 | 0.02 | 0.998 | 0.0200 | 0.842 | 0.1512 |
| | SCAD | 1 | 0 | 1.000 | 0.0000 | 0.996 | 0.0281 | 0.774 | 0.0787 | 0.996 | 0.0281 | 0.994 | 0.0343 | 0.664 | 0.1580 | 1.000 | 0.00 | 0.980 | 0.0603 | 0.730 | 0.1403 |
| | MCP | 1 | 0 | 1.000 | 0.0000 | 0.980 | 0.0603 | 0.786 | 0.0711 | 0.996 | 0.0281 | 0.994 | 0.0343 | 0.714 | 0.1511 | 1.000 | 0.00 | 0.976 | 0.0653 | 0.746 | 0.1359 |
| 6 | Ridge | 1 | 0 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.0000 | 1.000 | 0.00 | 1.000 | 0.0000 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 0.998 | 0.0200 | 0.994 | 0.0343 | 0.836 | 0.0916 | 0.998 | 0.0200 | 0.998 | 0.0200 | 0.670 | 0.1000 | 0.998 | 0.02 | 0.994 | 0.0343 | 0.826 | 0.1440 |
| | E-net | 1 | 0 | 1.000 | 0.0000 | 0.994 | 0.0343 | 0.844 | 0.0925 | 0.998 | 0.0200 | 1.000 | 0.0000 | 0.784 | 0.0615 | 0.998 | 0.02 | 0.998 | 0.0200 | 0.842 | 0.1512 |
| | SCAD | 1 | 0 | 1.000 | 0.0000 | 0.996 | 0.0281 | 0.774 | 0.0787 | 0.996 | 0.0281 | 0.994 | 0.0343 | 0.664 | 0.1580 | 1.000 | 0.00 | 0.980 | 0.0603 | 0.730 | 0.1403 |
| | MCP | 1 | 0 | 1.000 | 0.0000 | 0.980 | 0.0603 | 0.786 | 0.0711 | 0.996 | 0.0281 | 0.994 | 0.0343 | 0.714 | 0.1511 | 1.000 | 0.00 | 0.976 | 0.0653 | 0.746 | 0.1359 |

Table 25: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 1000$ and $p = 10$. See Figure 25 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC B | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC B | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.02 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| 3 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC B | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC B | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 0.998 | 0.02 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 0.998 | 0.02 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| 6 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC B | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC B | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC SB | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 0.998 | 0.02 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 0.998 | 0.02 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.00 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |

Table 26: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 1000$ and $p = 100$. See Figure 26 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| 3 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 |
| 6 | OLS | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC F | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | BIC F | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | AIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | BIC SF | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.996 | 0.0281 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.994 | 0.0343 |

Table 27: Mean and standard deviation of the $\beta$-sensitivity for the linear simulations when $n = 1000$ and $p = 2000$. See Figure 27 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.798 | 0.0200 | 1 | 0 | 1 | 0 | 0.796 | 0.0281 | 1 | 0 | 1 | 0 | 0.800 | 0.00 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.800 | 0.0000 | 1 | 0 | 1 | 0 | 0.800 | 0.0000 | 1 | 0 | 1 | 0 | 0.800 | 0.00 |
| 3 | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 0.998 | 0.02 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.796 | 0.0281 | 1 | 0 | 1 | 0 | 0.796 | 0.0281 | 1 | 0 | 1 | 0 | 0.800 | 0.00 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.800 | 0.0000 | 1 | 0 | 1 | 0 | 0.800 | 0.0000 | 1 | 0 | 1 | 0 | 0.800 | 0.00 |
| 6 | Ridge | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | Lasso | 1 | 0 | 1 | 0 | 1 | 0 | 0.992 | 0.0394 | 1 | 0 | 1 | 0 | 0.998 | 0.0200 | 1 | 0 | 1 | 0 | 0.998 | 0.02 |
| | E-net | 1 | 0 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.0000 | 1 | 0 | 1 | 0 | 1.000 | 0.00 |
| | SCAD | 1 | 0 | 1 | 0 | 1 | 0 | 0.796 | 0.0281 | 1 | 0 | 1 | 0 | 0.796 | 0.0281 | 1 | 0 | 1 | 0 | 0.800 | 0.00 |
| | MCP | 1 | 0 | 1 | 0 | 1 | 0 | 0.800 | 0.0000 | 1 | 0 | 1 | 0 | 0.800 | 0.0000 | 1 | 0 | 1 | 0 | 0.800 | 0.00 |

## 4.4 Tables for the $\beta$-specificity of the linear simulations

Table 28: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 50$ and $p = 10$. See Figure 28 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.7600 | 0.1929 | 0.7817 | 0.1846 | 0.8050 | 0.1774 | 0.7767 | 0.1823 | 0.7500 | 0.1932 | 0.7617 | 0.1854 | 0.7550 | 0.2030 | 0.7900 | 0.1814 | 0.7933 | 0.1806 | 0.7483 | 0.1873 |
| | BIC B | 0.9133 | 0.1450 | 0.9150 | 0.1431 | 0.9067 | 0.1261 | 0.9200 | 0.1123 | 0.9167 | 0.1350 | 0.9200 | 0.1123 | 0.8850 | 0.1355 | 0.9300 | 0.1090 | 0.9267 | 0.1094 | 0.9183 | 0.1391 |
| | AIC SB | 0.7600 | 0.1929 | 0.7817 | 0.1846 | 0.8050 | 0.1774 | 0.7767 | 0.1823 | 0.7500 | 0.1932 | 0.7600 | 0.1840 | 0.7500 | 0.2003 | 0.7883 | 0.1802 | 0.7917 | 0.1810 | 0.7483 | 0.1873 |
| | BIC SB | 0.9133 | 0.1450 | 0.9150 | 0.1431 | 0.9050 | 0.1281 | 0.9200 | 0.1123 | 0.9167 | 0.1350 | 0.9200 | 0.1123 | 0.8850 | 0.1355 | 0.9300 | 0.1090 | 0.9267 | 0.1094 | 0.9167 | 0.1391 |
| | AIC F | 0.7783 | 0.1836 | 0.8083 | 0.1731 | 0.8183 | 0.1677 | 0.8183 | 0.1555 | 0.7767 | 0.1808 | 0.7950 | 0.1639 | 0.8250 | 0.1630 | 0.8117 | 0.1735 | 0.8133 | 0.1663 | 0.8150 | 0.1587 |
| | BIC F | 0.9333 | 0.1231 | 0.9333 | 0.1136 | 0.9233 | 0.1044 | 0.9267 | 0.1094 | 0.9333 | 0.0977 | 0.9367 | 0.0970 | 0.9400 | 0.0963 | 0.9300 | 0.1090 | 0.9367 | 0.0999 | 0.9333 | 0.1086 |
| | AIC SF | 0.7783 | 0.1836 | 0.8083 | 0.1731 | 0.8200 | 0.1636 | 0.8183 | 0.1555 | 0.7767 | 0.1808 | 0.7967 | 0.1634 | 0.8333 | 0.1607 | 0.8117 | 0.1735 | 0.8133 | 0.1663 | 0.8167 | 0.1598 |
| | BIC SF | 0.9333 | 0.1231 | 0.9333 | 0.1136 | 0.9233 | 0.1044 | 0.9267 | 0.1094 | 0.9333 | 0.0977 | 0.9383 | 0.0967 | 0.9483 | 0.0908 | 0.9300 | 0.1090 | 0.9367 | 0.0999 | 0.9367 | 0.1054 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.8317 | 0.2072 | 0.8283 | 0.1946 | 0.8067 | 0.2075 | 0.8050 | 0.1881 | 0.8250 | 0.2084 | 0.7717 | 0.1991 | 0.7367 | 0.1776 | 0.8367 | 0.1804 | 0.7683 | 0.2403 | 0.7117 | 0.1878 |
| | E-net | 0.7867 | 0.2261 | 0.8000 | 0.2132 | 0.7767 | 0.2108 | 0.7667 | 0.2079 | 0.7950 | 0.2104 | 0.7333 | 0.1895 | 0.6883 | 0.1751 | 0.8000 | 0.1953 | 0.7333 | 0.2416 | 0.6550 | 0.1957 |
| | SCAD | 0.7383 | 0.3091 | 0.7750 | 0.2905 | 0.8417 | 0.2432 | 0.8367 | 0.2669 | 0.7283 | 0.3184 | 0.8050 | 0.2322 | 0.8067 | 0.2389 | 0.7967 | 0.2558 | 0.7950 | 0.2821 | 0.8433 | 0.2709 |
| | MCP | 0.7967 | 0.2955 | 0.8133 | 0.3055 | 0.8783 | 0.2130 | 0.8600 | 0.2342 | 0.7700 | 0.3331 | 0.8450 | 0.2499 | 0.8233 | 0.2460 | 0.8483 | 0.2405 | 0.8333 | 0.2773 | 0.8533 | 0.2714 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.7600 | 0.1929 | 0.7867 | 0.1710 | 0.7967 | 0.1701 | 0.7767 | 0.1942 | 0.7683 | 0.1923 | 0.7933 | 0.1710 | 0.7683 | 0.2064 | 0.8000 | 0.2010 | 0.7917 | 0.1681 | 0.7767 | 0.1838 |
| | BIC B | 0.9133 | 0.1450 | 0.9183 | 0.1124 | 0.9033 | 0.1258 | 0.9100 | 0.1285 | 0.9183 | 0.1019 | 0.9083 | 0.1193 | 0.8900 | 0.1445 | 0.9317 | 0.1062 | 0.9017 | 0.1300 | 0.9233 | 0.1070 |
| | AIC SB | 0.7600 | 0.1929 | 0.7850 | 0.1713 | 0.7950 | 0.1689 | 0.7767 | 0.1942 | 0.7683 | 0.1923 | 0.7933 | 0.1710 | 0.7683 | 0.2064 | 0.8000 | 0.2010 | 0.7867 | 0.1660 | 0.7767 | 0.1838 |
| | BIC SB | 0.9133 | 0.1450 | 0.9167 | 0.1124 | 0.9033 | 0.1258 | 0.9100 | 0.1285 | 0.9183 | 0.1019 | 0.9083 | 0.1193 | 0.8900 | 0.1445 | 0.9317 | 0.1062 | 0.9017 | 0.1300 | 0.9217 | 0.1071 |
| | AIC F | 0.7783 | 0.1836 | 0.8000 | 0.1675 | 0.8067 | 0.1512 | 0.8133 | 0.1761 | 0.8000 | 0.1741 | 0.8100 | 0.1741 | 0.8283 | 0.1827 | 0.8200 | 0.1752 | 0.8100 | 0.1554 | 0.8317 | 0.1451 |
| | BIC F | 0.9333 | 0.1231 | 0.9233 | 0.1017 | 0.9200 | 0.1018 | 0.9250 | 0.1095 | 0.9250 | 0.0987 | 0.9233 | 0.1044 | 0.9383 | 0.0967 | 0.9350 | 0.1030 | 0.9233 | 0.1122 | 0.9333 | 0.0977 |
| | AIC SF | 0.7783 | 0.1836 | 0.8000 | 0.1675 | 0.8067 | 0.1512 | 0.8133 | 0.1761 | 0.8017 | 0.1703 | 0.8117 | 0.1703 | 0.8483 | 0.1677 | 0.8200 | 0.1752 | 0.8100 | 0.1554 | 0.8333 | 0.1441 |
| | BIC SF | 0.9333 | 0.1231 | 0.9233 | 0.1017 | 0.9217 | 0.0990 | 0.9250 | 0.1095 | 0.9250 | 0.0987 | 0.9233 | 0.1044 | 0.9417 | 0.0959 | 0.9350 | 0.1030 | 0.9250 | 0.1121 | 0.9333 | 0.0977 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.8317 | 0.2072 | 0.8000 | 0.2065 | 0.7883 | 0.1878 | 0.7683 | 0.2036 | 0.8383 | 0.1842 | 0.7867 | 0.1896 | 0.7483 | 0.1873 | 0.8283 | 0.2351 | 0.7650 | 0.1806 | 0.7367 | 0.1970 |
| | E-net | 0.7867 | 0.2261 | 0.7600 | 0.2214 | 0.7467 | 0.1857 | 0.7300 | 0.2142 | 0.8067 | 0.1935 | 0.7533 | 0.1975 | 0.7083 | 0.1944 | 0.7917 | 0.2489 | 0.7250 | 0.1794 | 0.6967 | 0.2084 |
| | SCAD | 0.7383 | 0.3091 | 0.7800 | 0.2761 | 0.8250 | 0.2631 | 0.8083 | 0.2905 | 0.7367 | 0.3099 | 0.8033 | 0.2577 | 0.7900 | 0.2955 | 0.7533 | 0.3057 | 0.8217 | 0.2213 | 0.8500 | 0.2557 |
| | MCP | 0.7967 | 0.2955 | 0.8033 | 0.3009 | 0.8483 | 0.2733 | 0.8333 | 0.2638 | 0.7800 | 0.3186 | 0.8500 | 0.2445 | 0.8217 | 0.2587 | 0.8117 | 0.3131 | 0.8750 | 0.1886 | 0.8600 | 0.2436 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.7600 | 0.1929 | 0.7867 | 0.1710 | 0.7967 | 0.1701 | 0.7767 | 0.1942 | 0.7683 | 0.1923 | 0.7933 | 0.1710 | 0.7683 | 0.2064 | 0.8000 | 0.2010 | 0.7917 | 0.1681 | 0.7767 | 0.1838 |
| | BIC B | 0.9133 | 0.1450 | 0.9183 | 0.1124 | 0.9033 | 0.1258 | 0.9100 | 0.1285 | 0.9183 | 0.1019 | 0.9083 | 0.1193 | 0.8900 | 0.1445 | 0.9317 | 0.1062 | 0.9017 | 0.1300 | 0.9233 | 0.1070 |
| | AIC SB | 0.7600 | 0.1929 | 0.7850 | 0.1713 | 0.7950 | 0.1689 | 0.7767 | 0.1942 | 0.7683 | 0.1923 | 0.7933 | 0.1710 | 0.7683 | 0.2064 | 0.8000 | 0.2010 | 0.7867 | 0.1660 | 0.7767 | 0.1838 |
| | BIC SB | 0.9133 | 0.1450 | 0.9167 | 0.1124 | 0.9033 | 0.1258 | 0.9100 | 0.1285 | 0.9183 | 0.1019 | 0.9083 | 0.1193 | 0.8900 | 0.1445 | 0.9317 | 0.1062 | 0.9017 | 0.1300 | 0.9217 | 0.1071 |
| | AIC F | 0.7783 | 0.1836 | 0.8000 | 0.1675 | 0.8067 | 0.1512 | 0.8133 | 0.1761 | 0.8000 | 0.1741 | 0.8100 | 0.1741 | 0.8283 | 0.1827 | 0.8200 | 0.1752 | 0.8100 | 0.1554 | 0.8317 | 0.1451 |
| | BIC F | 0.9333 | 0.1231 | 0.9233 | 0.1017 | 0.9200 | 0.1018 | 0.9250 | 0.1095 | 0.9250 | 0.0987 | 0.9233 | 0.1044 | 0.9383 | 0.0967 | 0.9350 | 0.1030 | 0.9233 | 0.1122 | 0.9333 | 0.0977 |
| | AIC SF | 0.7783 | 0.1836 | 0.8000 | 0.1675 | 0.8067 | 0.1512 | 0.8133 | 0.1761 | 0.8017 | 0.1703 | 0.8117 | 0.1703 | 0.8483 | 0.1677 | 0.8200 | 0.1752 | 0.8100 | 0.1554 | 0.8333 | 0.1441 |
| | BIC SF | 0.9333 | 0.1231 | 0.9233 | 0.1017 | 0.9217 | 0.0990 | 0.9250 | 0.1095 | 0.9250 | 0.0987 | 0.9233 | 0.1044 | 0.9417 | 0.0959 | 0.9350 | 0.1030 | 0.9250 | 0.1121 | 0.9333 | 0.0977 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.8317 | 0.2072 | 0.8000 | 0.2065 | 0.7883 | 0.1878 | 0.7683 | 0.2036 | 0.8383 | 0.1842 | 0.7867 | 0.1896 | 0.7483 | 0.1873 | 0.8283 | 0.2351 | 0.7650 | 0.1806 | 0.7367 | 0.1970 |
| | E-net | 0.7867 | 0.2261 | 0.7600 | 0.2214 | 0.7467 | 0.1857 | 0.7300 | 0.2142 | 0.8067 | 0.1935 | 0.7533 | 0.1975 | 0.7083 | 0.1944 | 0.7917 | 0.2489 | 0.7250 | 0.1794 | 0.6967 | 0.2084 |
| | SCAD | 0.7383 | 0.3091 | 0.7800 | 0.2761 | 0.8250 | 0.2631 | 0.8083 | 0.2905 | 0.7367 | 0.3099 | 0.8033 | 0.2577 | 0.7900 | 0.2955 | 0.7533 | 0.3057 | 0.8217 | 0.2213 | 0.8500 | 0.2557 |
| | MCP | 0.7967 | 0.2955 | 0.8033 | 0.3009 | 0.8483 | 0.2733 | 0.8333 | 0.2638 | 0.7800 | 0.3186 | 0.8500 | 0.2445 | 0.8217 | 0.2587 | 0.8117 | 0.3131 | 0.8750 | 0.1886 | 0.8600 | 0.2436 |

Table 29: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 50$ and $p = 100$. See Figure 29 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9611 | 0.0382 | 0.9552 | 0.0464 | 0.9400 | 0.0505 | 0.9600 | 0.0315 | 0.9588 | 0.0409 | 0.9455 | 0.0395 | 0.9781 | 0.0434 | 0.9577 | 0.0403 | 0.9384 | 0.0470 | 0.9634 | 0.0368 |
| | E-net | 0.9525 | 0.0386 | 0.9433 | 0.0485 | 0.9273 | 0.0531 | 0.9426 | 0.0315 | 0.9462 | 0.0520 | 0.9336 | 0.0418 | 0.9718 | 0.0397 | 0.9475 | 0.0429 | 0.9262 | 0.0517 | 0.9499 | 0.0338 |
| | SCAD | 0.9559 | 0.0458 | 0.9665 | 0.0364 | 0.9833 | 0.0192 | 0.9971 | 0.0054 | 0.9666 | 0.0346 | 0.9738 | 0.0353 | 0.9817 | 0.0228 | 0.9628 | 0.0376 | 0.9777 | 0.0249 | 0.9852 | 0.0134 |
| | MCP | 0.9836 | 0.0208 | 0.9870 | 0.0176 | 0.9944 | 0.0105 | 0.9978 | 0.0048 | 0.9877 | 0.0182 | 0.9880 | 0.0203 | 0.9899 | 0.0153 | 0.9862 | 0.0181 | 0.9902 | 0.0154 | 0.9909 | 0.0091 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9611 | 0.0382 | 0.9495 | 0.0561 | 0.9416 | 0.0491 | 0.9568 | 0.0297 | 0.9464 | 0.0594 | 0.9384 | 0.0483 | 0.9803 | 0.0391 | 0.9490 | 0.0468 | 0.9424 | 0.0415 | 0.9628 | 0.0429 |
| | E-net | 0.9525 | 0.0386 | 0.9406 | 0.0543 | 0.9308 | 0.0512 | 0.9385 | 0.0304 | 0.9369 | 0.0585 | 0.9289 | 0.0471 | 0.9729 | 0.0365 | 0.9383 | 0.0485 | 0.9305 | 0.0459 | 0.9484 | 0.0409 |
| | SCAD | 0.9559 | 0.0458 | 0.9659 | 0.0342 | 0.9845 | 0.0182 | 0.9962 | 0.0117 | 0.9649 | 0.0405 | 0.9679 | 0.0372 | 0.9838 | 0.0216 | 0.9642 | 0.0329 | 0.9825 | 0.0245 | 0.9850 | 0.0145 |
| | MCP | 0.9836 | 0.0208 | 0.9873 | 0.0162 | 0.9952 | 0.0080 | 0.9970 | 0.0063 | 0.9843 | 0.0230 | 0.9869 | 0.0211 | 0.9925 | 0.0122 | 0.9836 | 0.0204 | 0.9931 | 0.0114 | 0.9897 | 0.0105 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9611 | 0.0382 | 0.9495 | 0.0561 | 0.9416 | 0.0491 | 0.9568 | 0.0297 | 0.9464 | 0.0594 | 0.9384 | 0.0483 | 0.9803 | 0.0391 | 0.9490 | 0.0468 | 0.9424 | 0.0415 | 0.9628 | 0.0429 |
| | E-net | 0.9525 | 0.0386 | 0.9406 | 0.0543 | 0.9308 | 0.0512 | 0.9385 | 0.0304 | 0.9369 | 0.0585 | 0.9289 | 0.0471 | 0.9729 | 0.0365 | 0.9383 | 0.0485 | 0.9305 | 0.0459 | 0.9484 | 0.0409 |
| | SCAD | 0.9559 | 0.0458 | 0.9659 | 0.0342 | 0.9845 | 0.0182 | 0.9962 | 0.0117 | 0.9649 | 0.0405 | 0.9679 | 0.0372 | 0.9838 | 0.0216 | 0.9642 | 0.0329 | 0.9825 | 0.0245 | 0.9850 | 0.0145 |
| | MCP | 0.9836 | 0.0208 | 0.9873 | 0.0162 | 0.9952 | 0.0080 | 0.9970 | 0.0063 | 0.9843 | 0.0230 | 0.9869 | 0.0211 | 0.9925 | 0.0122 | 0.9836 | 0.0204 | 0.9931 | 0.0114 | 0.9897 | 0.0105 |

Table 30: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 50$ and $p = 2000$. See Figure 30 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9976 | 0.0023 | 0.9964 | 0.0026 | 0.9955 | 0.0032 | 0.9961 | 0.0022 | 0.9977 | 0.0022 | 0.9983 | 0.0029 | 0.9995 | 0.0012 | 0.9977 | 0.0024 | 0.9987 | 0.0020 | 0.9988 | 0.0014 |
| | E-net | 0.9972 | 0.0025 | 0.9958 | 0.0032 | 0.9948 | 0.0031 | 0.9928 | 0.0024 | 0.9972 | 0.0027 | 0.9983 | 0.0028 | 0.9991 | 0.0011 | 0.9974 | 0.0027 | 0.9986 | 0.0020 | 0.9969 | 0.0018 |
| | SCAD | 0.9972 | 0.0033 | 0.9973 | 0.0028 | 0.9984 | 0.0019 | 0.9990 | 0.0019 | 0.9972 | 0.0029 | 0.9964 | 0.0035 | 0.9981 | 0.0031 | 0.9974 | 0.0028 | 0.9966 | 0.0029 | 0.9990 | 0.0019 |
| | MCP | 0.9993 | 0.0010 | 0.9994 | 0.0009 | 0.9997 | 0.0005 | 0.9998 | 0.0003 | 0.9994 | 0.0009 | 0.9994 | 0.0010 | 0.9993 | 0.0012 | 0.9994 | 0.0010 | 0.9991 | 0.0012 | 0.9996 | 0.0009 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9976 | 0.0023 | 0.9962 | 0.0029 | 0.9964 | 0.0030 | 0.9958 | 0.0020 | 0.9976 | 0.0025 | 0.9987 | 0.0021 | 0.9994 | 0.0014 | 0.9972 | 0.0028 | 0.9984 | 0.0030 | 0.9987 | 0.0013 |
| | E-net | 0.9972 | 0.0025 | 0.9958 | 0.0030 | 0.9955 | 0.0030 | 0.9924 | 0.0023 | 0.9973 | 0.0026 | 0.9986 | 0.0022 | 0.9987 | 0.0027 | 0.9971 | 0.0026 | 0.9983 | 0.0029 | 0.9969 | 0.0017 |
| | SCAD | 0.9972 | 0.0033 | 0.9972 | 0.0026 | 0.9982 | 0.0021 | 0.9989 | 0.0021 | 0.9971 | 0.0031 | 0.9960 | 0.0032 | 0.9985 | 0.0028 | 0.9970 | 0.0031 | 0.9973 | 0.0025 | 0.9990 | 0.0019 |
| | MCP | 0.9993 | 0.0010 | 0.9994 | 0.0008 | 0.9996 | 0.0006 | 0.9998 | 0.0004 | 0.9994 | 0.0009 | 0.9988 | 0.0015 | 0.9995 | 0.0009 | 0.9995 | 0.0008 | 0.9996 | 0.0008 | 0.9996 | 0.0008 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9976 | 0.0023 | 0.9962 | 0.0029 | 0.9964 | 0.0030 | 0.9958 | 0.0020 | 0.9976 | 0.0027 | 0.9987 | 0.0021 | 0.9994 | 0.0014 | 0.9972 | 0.0028 | 0.9984 | 0.0030 | 0.9987 | 0.0013 |
| | E-net | 0.9972 | 0.0025 | 0.9958 | 0.0030 | 0.9955 | 0.0030 | 0.9924 | 0.0023 | 0.9975 | 0.0023 | 0.9986 | 0.0022 | 0.9987 | 0.0027 | 0.9971 | 0.0026 | 0.9983 | 0.0029 | 0.9969 | 0.0017 |
| | SCAD | 0.9972 | 0.0033 | 0.9972 | 0.0026 | 0.9982 | 0.0021 | 0.9989 | 0.0021 | 0.9971 | 0.0029 | 0.9960 | 0.0032 | 0.9985 | 0.0028 | 0.9970 | 0.0031 | 0.9973 | 0.0025 | 0.9990 | 0.0019 |
| | MCP | 0.9993 | 0.0010 | 0.9994 | 0.0008 | 0.9996 | 0.0006 | 0.9998 | 0.0004 | 0.9994 | 0.0009 | 0.9988 | 0.0015 | 0.9995 | 0.0009 | 0.9995 | 0.0008 | 0.9996 | 0.0008 | 0.9996 | 0.0008 |

Table 31: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 200$ and $p = 10$. See Figure 31 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.8017 | 0.1752 | 0.7967 | 0.1564 | 0.8017 | 0.1752 | 0.7933 | 0.1609 | 0.8117 | 0.1767 | 0.8033 | 0.1648 | 0.7750 | 0.1944 | 0.7700 | 0.1585 | 0.8267 | 0.1534 | 0.7700 | 0.1753 |
| | BIC B | 0.9717 | 0.0672 | 0.9767 | 0.0581 | 0.9750 | 0.0686 | 0.9633 | 0.0840 | 0.9683 | 0.0738 | 0.9683 | 0.0877 | 0.9550 | 0.1107 | 0.9667 | 0.0711 | 0.9700 | 0.0763 | 0.9633 | 0.0771 |
| | AIC SB | 0.8017 | 0.1752 | 0.7967 | 0.1564 | 0.8017 | 0.1752 | 0.7933 | 0.1609 | 0.8117 | 0.1767 | 0.8017 | 0.1636 | 0.7750 | 0.1944 | 0.7700 | 0.1585 | 0.8267 | 0.1534 | 0.7683 | 0.1755 |
| | BIC SB | 0.9717 | 0.0672 | 0.9767 | 0.0581 | 0.9750 | 0.0686 | 0.9633 | 0.0840 | 0.9683 | 0.0738 | 0.9683 | 0.0877 | 0.9550 | 0.1107 | 0.9667 | 0.0711 | 0.9700 | 0.0763 | 0.9633 | 0.0771 |
| | AIC F | 0.8050 | 0.1659 | 0.8133 | 0.1446 | 0.8217 | 0.1679 | 0.8050 | 0.1642 | 0.8300 | 0.1691 | 0.8333 | 0.1498 | 0.8517 | 0.1439 | 0.7767 | 0.1575 | 0.8467 | 0.1492 | 0.8083 | 0.1698 |
| | BIC F | 0.9717 | 0.0672 | 0.9767 | 0.0581 | 0.9750 | 0.0686 | 0.9633 | 0.0840 | 0.9683 | 0.0738 | 0.9783 | 0.0697 | 0.9783 | 0.0611 | 0.9667 | 0.0711 | 0.9733 | 0.0700 | 0.9683 | 0.0699 |
| | AIC SF | 0.8050 | 0.1659 | 0.8133 | 0.1446 | 0.8217 | 0.1679 | 0.8050 | 0.1642 | 0.8300 | 0.1691 | 0.8333 | 0.1498 | 0.8517 | 0.1439 | 0.7767 | 0.1575 | 0.8467 | 0.1492 | 0.8083 | 0.1698 |
| | BIC SF | 0.9717 | 0.0672 | 0.9767 | 0.0581 | 0.9750 | 0.0686 | 0.9633 | 0.0840 | 0.9683 | 0.0738 | 0.9783 | 0.0697 | 0.9783 | 0.0611 | 0.9667 | 0.0711 | 0.9733 | 0.0700 | 0.9683 | 0.0699 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9167 | 0.1733 | 0.8833 | 0.1716 | 0.8683 | 0.1612 | 0.8433 | 0.1689 | 0.9167 | 0.1391 | 0.8983 | 0.1496 | 0.7983 | 0.1594 | 0.8883 | 0.1608 | 0.8600 | 0.1653 | 0.7433 | 0.1579 |
| | E-net | 0.8983 | 0.1739 | 0.8617 | 0.1820 | 0.8217 | 0.1914 | 0.8000 | 0.1880 | 0.8833 | 0.1733 | 0.8517 | 0.1690 | 0.7617 | 0.1745 | 0.8467 | 0.1815 | 0.8317 | 0.1667 | 0.6917 | 0.1763 |
| | SCAD | 0.8017 | 0.2624 | 0.8333 | 0.2369 | 0.8650 | 0.2329 | 0.8600 | 0.2635 | 0.8550 | 0.2305 | 0.8583 | 0.2137 | 0.8050 | 0.2873 | 0.7683 | 0.2977 | 0.8850 | 0.1891 | 0.8317 | 0.2906 |
| | MCP | 0.8567 | 0.2518 | 0.8700 | 0.2388 | 0.9033 | 0.2121 | 0.8650 | 0.2635 | 0.8933 | 0.2165 | 0.9050 | 0.1943 | 0.8067 | 0.2956 | 0.8217 | 0.2933 | 0.9100 | 0.1901 | 0.8533 | 0.2609 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.8017 | 0.1752 | 0.8150 | 0.1587 | 0.8033 | 0.1613 | 0.7950 | 0.1639 | 0.8017 | 0.1584 | 0.7917 | 0.1731 | 0.7783 | 0.1925 | 0.8333 | 0.1553 | 0.7817 | 0.1905 | 0.7750 | 0.1731 |
| | BIC B | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9583 | 0.0898 | 0.9700 | 0.0686 | 0.9717 | 0.0713 | 0.9500 | 0.1019 | 0.9650 | 0.0796 | 0.9633 | 0.0840 | 0.9650 | 0.0796 |
| | AIC SB | 0.8017 | 0.1752 | 0.8150 | 0.1587 | 0.8033 | 0.1613 | 0.7950 | 0.1639 | 0.8017 | 0.1584 | 0.7917 | 0.1731 | 0.7783 | 0.1925 | 0.8333 | 0.1553 | 0.7817 | 0.1905 | 0.7750 | 0.1731 |
| | BIC SB | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9583 | 0.0898 | 0.9700 | 0.0686 | 0.9717 | 0.0713 | 0.9500 | 0.1019 | 0.9650 | 0.0796 | 0.9633 | 0.0840 | 0.9650 | 0.0796 |
| | AIC F | 0.8050 | 0.1659 | 0.8150 | 0.1587 | 0.8067 | 0.1584 | 0.8133 | 0.1680 | 0.8100 | 0.1499 | 0.8167 | 0.1615 | 0.8300 | 0.1553 | 0.8400 | 0.1552 | 0.8083 | 0.1714 | 0.8217 | 0.1663 |
| | BIC F | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9717 | 0.0713 | 0.9700 | 0.0686 | 0.9783 | 0.0563 | 0.9650 | 0.0796 | 0.9683 | 0.0738 | 0.9700 | 0.0726 | 0.9750 | 0.0643 |
| | AIC SF | 0.8050 | 0.1659 | 0.8150 | 0.1587 | 0.8067 | 0.1584 | 0.8133 | 0.1680 | 0.8100 | 0.1499 | 0.8167 | 0.1615 | 0.8317 | 0.1552 | 0.8400 | 0.1552 | 0.8083 | 0.1714 | 0.8233 | 0.1638 |
| | BIC SF | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9717 | 0.0713 | 0.9700 | 0.0686 | 0.9783 | 0.0563 | 0.9667 | 0.0786 | 0.9683 | 0.0738 | 0.9700 | 0.0726 | 0.9750 | 0.0643 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9167 | 0.1733 | 0.9133 | 0.1371 | 0.8583 | 0.1747 | 0.8817 | 0.1541 | 0.9183 | 0.1329 | 0.8917 | 0.1369 | 0.7917 | 0.1794 | 0.9183 | 0.1265 | 0.8567 | 0.1642 | 0.7633 | 0.1791 |
| | E-net | 0.8983 | 0.1739 | 0.8867 | 0.1656 | 0.8317 | 0.1932 | 0.8533 | 0.1745 | 0.9017 | 0.1423 | 0.8533 | 0.1558 | 0.7417 | 0.1901 | 0.8983 | 0.1399 | 0.7950 | 0.1817 | 0.7083 | 0.1794 |
| | SCAD | 0.8017 | 0.2624 | 0.8467 | 0.2389 | 0.8617 | 0.2346 | 0.8067 | 0.3095 | 0.8650 | 0.1963 | 0.8400 | 0.2209 | 0.8000 | 0.2670 | 0.8567 | 0.2171 | 0.8433 | 0.2425 | 0.8250 | 0.2943 |
| | MCP | 0.8567 | 0.2518 | 0.8917 | 0.2289 | 0.8817 | 0.2349 | 0.8183 | 0.2969 | 0.9083 | 0.1944 | 0.8833 | 0.2017 | 0.8100 | 0.2773 | 0.9067 | 0.1929 | 0.8850 | 0.2281 | 0.8233 | 0.2957 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.8017 | 0.1752 | 0.8150 | 0.1587 | 0.8033 | 0.1613 | 0.7950 | 0.1639 | 0.8017 | 0.1584 | 0.7917 | 0.1731 | 0.7783 | 0.1925 | 0.8333 | 0.1553 | 0.7817 | 0.1905 | 0.7750 | 0.1731 |
| | BIC B | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9583 | 0.0898 | 0.9700 | 0.0686 | 0.9717 | 0.0713 | 0.9500 | 0.1019 | 0.9650 | 0.0796 | 0.9633 | 0.0840 | 0.9650 | 0.0796 |
| | AIC SB | 0.8017 | 0.1752 | 0.8150 | 0.1587 | 0.8033 | 0.1613 | 0.7950 | 0.1639 | 0.8017 | 0.1584 | 0.7917 | 0.1731 | 0.7783 | 0.1925 | 0.8333 | 0.1553 | 0.7817 | 0.1905 | 0.7750 | 0.1731 |
| | BIC SB | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9583 | 0.0898 | 0.9700 | 0.0686 | 0.9717 | 0.0713 | 0.9500 | 0.1019 | 0.9650 | 0.0796 | 0.9633 | 0.0840 | 0.9650 | 0.0796 |
| | AIC F | 0.8050 | 0.1659 | 0.8150 | 0.1587 | 0.8067 | 0.1584 | 0.8133 | 0.1680 | 0.8100 | 0.1499 | 0.8167 | 0.1615 | 0.8300 | 0.1553 | 0.8400 | 0.1552 | 0.8083 | 0.1714 | 0.8217 | 0.1663 |
| | BIC F | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9717 | 0.0713 | 0.9700 | 0.0686 | 0.9783 | 0.0563 | 0.9650 | 0.0796 | 0.9683 | 0.0738 | 0.9700 | 0.0726 | 0.9750 | 0.0643 |
| | AIC SF | 0.8050 | 0.1659 | 0.8150 | 0.1587 | 0.8067 | 0.1584 | 0.8133 | 0.1680 | 0.8100 | 0.1499 | 0.8167 | 0.1615 | 0.8317 | 0.1526 | 0.8400 | 0.1552 | 0.8083 | 0.1714 | 0.8233 | 0.1638 |
| | BIC SF | 0.9717 | 0.0672 | 0.9717 | 0.0713 | 0.9650 | 0.0864 | 0.9717 | 0.0713 | 0.9700 | 0.0686 | 0.9783 | 0.0563 | 0.9667 | 0.0786 | 0.9683 | 0.0738 | 0.9700 | 0.0726 | 0.9750 | 0.0643 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9167 | 0.1733 | 0.9133 | 0.1371 | 0.8583 | 0.1747 | 0.8817 | 0.1541 | 0.9183 | 0.1329 | 0.8917 | 0.1369 | 0.7917 | 0.1794 | 0.9183 | 0.1265 | 0.8567 | 0.1642 | 0.7633 | 0.1791 |
| | E-net | 0.8983 | 0.1739 | 0.8867 | 0.1656 | 0.8317 | 0.1932 | 0.8533 | 0.1745 | 0.9017 | 0.1423 | 0.8533 | 0.1558 | 0.7417 | 0.1901 | 0.8983 | 0.1399 | 0.7950 | 0.1817 | 0.7083 | 0.1794 |
| | SCAD | 0.8017 | 0.2624 | 0.8467 | 0.2389 | 0.8617 | 0.2346 | 0.8067 | 0.3095 | 0.8650 | 0.1963 | 0.8400 | 0.2209 | 0.8000 | 0.2670 | 0.8567 | 0.2171 | 0.8433 | 0.2425 | 0.8250 | 0.2943 |
| | MCP | 0.8567 | 0.2518 | 0.8917 | 0.2289 | 0.8817 | 0.2349 | 0.8183 | 0.2969 | 0.9083 | 0.1944 | 0.8833 | 0.2017 | 0.8100 | 0.2773 | 0.9067 | 0.1929 | 0.8850 | 0.2281 | 0.8233 | 0.2957 |

Table 32: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 200$ and $p = 100$. See Figure 32 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.7760 | 0.0636 | 0.7742 | 0.0629 | 0.7844 | 0.0596 | 0.7791 | 0.0664 | 0.7776 | 0.0623 | 0.8079 | 0.0655 | 0.8916 | 0.0676 | 0.7840 | 0.0607 | 0.7899 | 0.0639 | 0.8858 | 0.0711 |
| | BIC F | 0.9732 | 0.0155 | 0.9757 | 0.0181 | 0.9771 | 0.0149 | 0.9781 | 0.0171 | 0.9754 | 0.0182 | 0.9795 | 0.0151 | 0.9894 | 0.0121 | 0.9774 | 0.0166 | 0.9831 | 0.0156 | 0.9908 | 0.0114 |
| | AIC SF | 0.7794 | 0.0571 | 0.7812 | 0.0566 | 0.7901 | 0.0573 | 0.7837 | 0.0623 | 0.7808 | 0.0586 | 0.8162 | 0.0619 | 0.8968 | 0.0628 | 0.7876 | 0.0596 | 0.7931 | 0.0658 | 0.8869 | 0.0733 |
| | BIC SF | 0.9736 | 0.0148 | 0.9758 | 0.0178 | 0.9771 | 0.0150 | 0.9781 | 0.0171 | 0.9756 | 0.0177 | 0.9795 | 0.0151 | 0.9894 | 0.0121 | 0.9774 | 0.0166 | 0.9832 | 0.0155 | 0.9908 | 0.0114 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9900 | 0.0144 | 0.9743 | 0.0248 | 0.9669 | 0.0260 | 0.9602 | 0.0304 | 0.9857 | 0.0204 | 0.9774 | 0.0259 | 0.9111 | 0.0376 | 0.9838 | 0.0191 | 0.9703 | 0.0216 | 0.9568 | 0.0243 |
| | E-net | 0.9854 | 0.0169 | 0.9659 | 0.0285 | 0.9578 | 0.0271 | 0.9473 | 0.0322 | 0.9791 | 0.0264 | 0.9686 | 0.0318 | 0.8998 | 0.0403 | 0.9785 | 0.0206 | 0.9619 | 0.0238 | 0.9473 | 0.0277 |
| | SCAD | 0.9625 | 0.0383 | 0.9567 | 0.0374 | 0.9760 | 0.0254 | 0.9979 | 0.0066 | 0.9601 | 0.0460 | 0.9581 | 0.0377 | 0.9772 | 0.0299 | 0.9624 | 0.0372 | 0.9585 | 0.0322 | 0.9874 | 0.0170 |
| | MCP | 0.9866 | 0.0200 | 0.9861 | 0.0229 | 0.9942 | 0.0116 | 0.9980 | 0.0055 | 0.9839 | 0.0254 | 0.9856 | 0.0224 | 0.9907 | 0.0159 | 0.9873 | 0.0226 | 0.9858 | 0.0162 | 0.9909 | 0.0150 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.7760 | 0.0636 | 0.7662 | 0.0549 | 0.7760 | 0.0629 | 0.7783 | 0.0557 | 0.7682 | 0.0619 | 0.8160 | 0.0554 | 0.8895 | 0.0673 | 0.7869 | 0.0525 | 0.8017 | 0.0635 | 0.8929 | 0.0670 |
| | BIC F | 0.9732 | 0.0155 | 0.9789 | 0.0179 | 0.9805 | 0.0177 | 0.9783 | 0.0150 | 0.9760 | 0.0174 | 0.9793 | 0.0139 | 0.9889 | 0.0121 | 0.9786 | 0.0155 | 0.9833 | 0.0159 | 0.9896 | 0.0121 |
| | AIC SF | 0.7794 | 0.0571 | 0.7708 | 0.0567 | 0.7851 | 0.0555 | 0.7829 | 0.0488 | 0.7784 | 0.0559 | 0.8212 | 0.0542 | 0.8971 | 0.0589 | 0.7919 | 0.0528 | 0.8065 | 0.0589 | 0.8974 | 0.0603 |
| | BIC SF | 0.9736 | 0.0148 | 0.9791 | 0.0174 | 0.9807 | 0.0175 | 0.9782 | 0.0151 | 0.9760 | 0.0174 | 0.9795 | 0.0137 | 0.9890 | 0.0122 | 0.9786 | 0.0156 | 0.9834 | 0.0157 | 0.9896 | 0.0121 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9900 | 0.0144 | 0.9769 | 0.0245 | 0.9694 | 0.0268 | 0.9690 | 0.0243 | 0.9864 | 0.0226 | 0.9774 | 0.0291 | 0.9120 | 0.0362 | 0.9833 | 0.0209 | 0.9719 | 0.0193 | 0.9556 | 0.0236 |
| | E-net | 0.9854 | 0.0169 | 0.9671 | 0.0289 | 0.9566 | 0.0310 | 0.9568 | 0.0293 | 0.9778 | 0.0286 | 0.9668 | 0.0346 | 0.9011 | 0.0391 | 0.9767 | 0.0247 | 0.9620 | 0.0222 | 0.9465 | 0.0267 |
| | SCAD | 0.9625 | 0.0383 | 0.9676 | 0.0355 | 0.9800 | 0.0231 | 0.9953 | 0.0156 | 0.9605 | 0.0388 | 0.9570 | 0.0375 | 0.9791 | 0.0280 | 0.9631 | 0.0373 | 0.9645 | 0.0304 | 0.9883 | 0.0170 |
| | MCP | 0.9866 | 0.0200 | 0.9877 | 0.0210 | 0.9959 | 0.0094 | 0.9958 | 0.0144 | 0.9869 | 0.0235 | 0.9849 | 0.0223 | 0.9916 | 0.0135 | 0.9849 | 0.0203 | 0.9881 | 0.0145 | 0.9929 | 0.0130 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.7760 | 0.0636 | 0.7662 | 0.0549 | 0.7760 | 0.0629 | 0.7783 | 0.0557 | 0.7682 | 0.0619 | 0.8160 | 0.0554 | 0.8895 | 0.0673 | 0.7869 | 0.0525 | 0.8017 | 0.0635 | 0.8929 | 0.0670 |
| | BIC F | 0.9732 | 0.0155 | 0.9789 | 0.0179 | 0.9805 | 0.0177 | 0.9783 | 0.0150 | 0.9760 | 0.0174 | 0.9793 | 0.0139 | 0.9889 | 0.0121 | 0.9786 | 0.0155 | 0.9833 | 0.0159 | 0.9896 | 0.0121 |
| | AIC SF | 0.7794 | 0.0571 | 0.7708 | 0.0567 | 0.7851 | 0.0555 | 0.7829 | 0.0488 | 0.7784 | 0.0559 | 0.8212 | 0.0542 | 0.8971 | 0.0589 | 0.7919 | 0.0528 | 0.8065 | 0.0589 | 0.8974 | 0.0603 |
| | BIC SF | 0.9736 | 0.0148 | 0.9791 | 0.0174 | 0.9807 | 0.0175 | 0.9782 | 0.0151 | 0.9760 | 0.0174 | 0.9795 | 0.0137 | 0.9890 | 0.0122 | 0.9786 | 0.0156 | 0.9834 | 0.0157 | 0.9896 | 0.0121 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9900 | 0.0144 | 0.9769 | 0.0245 | 0.9694 | 0.0268 | 0.9690 | 0.0243 | 0.9864 | 0.0226 | 0.9774 | 0.0291 | 0.9120 | 0.0362 | 0.9833 | 0.0209 | 0.9719 | 0.0193 | 0.9556 | 0.0236 |
| | E-net | 0.9854 | 0.0169 | 0.9671 | 0.0289 | 0.9566 | 0.0310 | 0.9568 | 0.0293 | 0.9778 | 0.0286 | 0.9668 | 0.0346 | 0.9011 | 0.0391 | 0.9767 | 0.0247 | 0.9620 | 0.0222 | 0.9465 | 0.0267 |
| | SCAD | 0.9625 | 0.0383 | 0.9676 | 0.0355 | 0.9800 | 0.0231 | 0.9953 | 0.0156 | 0.9605 | 0.0388 | 0.9570 | 0.0375 | 0.9791 | 0.0280 | 0.9631 | 0.0373 | 0.9645 | 0.0304 | 0.9883 | 0.0170 |
| | MCP | 0.9866 | 0.0200 | 0.9877 | 0.0210 | 0.9959 | 0.0094 | 0.9958 | 0.0144 | 0.9869 | 0.0235 | 0.9849 | 0.0223 | 0.9916 | 0.0135 | 0.9849 | 0.0203 | 0.9881 | 0.0145 | 0.9929 | 0.0130 |

Table 33: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 200$ and $p = 2000$. See Figure 33 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9989 | 0.0017 | 0.9971 | 0.0029 | 0.9958 | 0.0026 | 0.9958 | 0.0026 | 0.9989 | 0.0015 | 0.9971 | 0.0040 | 0.9996 | 0.0026 | 0.9981 | 0.0032 | 0.9968 | 0.0025 | 0.9930 | 0.0050 |
| | E-net | 0.9984 | 0.0021 | 0.9960 | 0.0031 | 0.9945 | 0.0027 | 0.9946 | 0.0028 | 0.9983 | 0.0017 | 0.9961 | 0.0047 | 0.9992 | 0.0029 | 0.9975 | 0.0037 | 0.9954 | 0.0030 | 0.9920 | 0.0051 |
| | SCAD | 0.9943 | 0.0051 | 0.9957 | 0.0036 | 0.9981 | 0.0018 | 1.0000 | 0.0000 | 0.9951 | 0.0046 | 0.9939 | 0.0047 | 0.9947 | 0.0048 | 0.9944 | 0.0047 | 0.9963 | 0.0032 | 0.9989 | 0.0011 |
| | MCP | 0.9987 | 0.0016 | 0.9990 | 0.0013 | 0.9996 | 0.0007 | 1.0000 | 0.0000 | 0.9985 | 0.0021 | 0.9979 | 0.0024 | 0.9972 | 0.0023 | 0.9984 | 0.0023 | 0.9986 | 0.0016 | 0.9995 | 0.0006 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9989 | 0.0017 | 0.9974 | 0.0022 | 0.9953 | 0.0028 | 0.9957 | 0.0023 | 0.9988 | 0.0017 | 0.9971 | 0.0033 | 0.9996 | 0.0026 | 0.9985 | 0.0019 | 0.9966 | 0.0028 | 0.9928 | 0.0049 |
| | E-net | 0.9984 | 0.0021 | 0.9961 | 0.0027 | 0.9939 | 0.0031 | 0.9945 | 0.0024 | 0.9983 | 0.0021 | 0.9961 | 0.0040 | 0.9991 | 0.0027 | 0.9978 | 0.0025 | 0.9952 | 0.0032 | 0.9920 | 0.0047 |
| | SCAD | 0.9943 | 0.0051 | 0.9956 | 0.0037 | 0.9979 | 0.0020 | 1.0000 | 0.0000 | 0.9952 | 0.0043 | 0.9934 | 0.0047 | 0.9954 | 0.0040 | 0.9945 | 0.0048 | 0.9964 | 0.0028 | 0.9990 | 0.0012 |
| | MCP | 0.9987 | 0.0016 | 0.9987 | 0.0016 | 0.9996 | 0.0007 | 1.0000 | 0.0000 | 0.9986 | 0.0021 | 0.9979 | 0.0021 | 0.9977 | 0.0022 | 0.9983 | 0.0020 | 0.9987 | 0.0014 | 0.9995 | 0.0007 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9989 | 0.0017 | 0.9974 | 0.0022 | 0.9953 | 0.0028 | 0.9957 | 0.0023 | 0.9986 | 0.0022 | 0.9971 | 0.0033 | 0.9996 | 0.0026 | 0.9985 | 0.0019 | 0.9966 | 0.0028 | 0.9928 | 0.0049 |
| | E-net | 0.9984 | 0.0021 | 0.9961 | 0.0027 | 0.9939 | 0.0031 | 0.9945 | 0.0024 | 0.9979 | 0.0026 | 0.9961 | 0.0040 | 0.9991 | 0.0027 | 0.9978 | 0.0025 | 0.9952 | 0.0032 | 0.9920 | 0.0047 |
| | SCAD | 0.9943 | 0.0051 | 0.9956 | 0.0037 | 0.9979 | 0.0020 | 1.0000 | 0.0000 | 0.9947 | 0.0047 | 0.9934 | 0.0047 | 0.9954 | 0.0040 | 0.9945 | 0.0048 | 0.9964 | 0.0028 | 0.9990 | 0.0012 |
| | MCP | 0.9987 | 0.0016 | 0.9987 | 0.0016 | 0.9996 | 0.0007 | 1.0000 | 0.0000 | 0.9984 | 0.0021 | 0.9979 | 0.0021 | 0.9977 | 0.0022 | 0.9983 | 0.0020 | 0.9987 | 0.0014 | 0.9995 | 0.0007 |

Table 34: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 1000$ and $p = 10$. See Figure 34 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.8317 | 0.1526 | 0.8350 | 0.1431 | 0.8200 | 0.1548 | 0.8317 | 0.1562 | 0.8367 | 0.1479 | 0.8050 | 0.1774 | 0.8067 | 0.1949 | 0.8417 | 0.1542 | 0.8300 | 0.1724 | 0.8350 | 0.1700 |
| | BIC B | 0.9917 | 0.0365 | 0.9867 | 0.0454 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9883 | 0.0489 | 0.9900 | 0.0398 | 0.9817 | 0.0707 | 0.9933 | 0.0328 | 0.9950 | 0.0286 | 0.9883 | 0.0427 |
| | AIC SB | 0.8317 | 0.1526 | 0.8350 | 0.1431 | 0.8200 | 0.1548 | 0.8317 | 0.1562 | 0.8367 | 0.1479 | 0.8050 | 0.1774 | 0.8050 | 0.1954 | 0.8417 | 0.1542 | 0.8300 | 0.1724 | 0.8350 | 0.1700 |
| | BIC SB | 0.9917 | 0.0365 | 0.9867 | 0.0454 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9883 | 0.0489 | 0.9900 | 0.0398 | 0.9817 | 0.0707 | 0.9933 | 0.0328 | 0.9950 | 0.0286 | 0.9883 | 0.0427 |
| | AIC F | 0.8317 | 0.1526 | 0.8383 | 0.1430 | 0.8400 | 0.1478 | 0.8483 | 0.1443 | 0.8400 | 0.1439 | 0.8333 | 0.1589 | 0.8700 | 0.1528 | 0.8417 | 0.1542 | 0.8467 | 0.1686 | 0.8517 | 0.1622 |
| | BIC F | 0.9917 | 0.0365 | 0.9867 | 0.0454 | 0.9950 | 0.0286 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9900 | 0.0398 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9950 | 0.0286 | 0.9883 | 0.0427 |
| | AIC SF | 0.8317 | 0.1526 | 0.8383 | 0.1430 | 0.8400 | 0.1478 | 0.8483 | 0.1443 | 0.8400 | 0.1439 | 0.8333 | 0.1589 | 0.8700 | 0.1528 | 0.8417 | 0.1542 | 0.8467 | 0.1686 | 0.8517 | 0.1622 |
| | BIC SF | 0.9917 | 0.0365 | 0.9867 | 0.0454 | 0.9950 | 0.0286 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9900 | 0.0398 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9950 | 0.0286 | 0.9883 | 0.0427 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9933 | 0.0328 | 0.9783 | 0.0611 | 0.9633 | 0.0771 | 0.9400 | 0.1073 | 0.9917 | 0.0365 | 0.9733 | 0.0658 | 0.8700 | 0.1373 | 0.9783 | 0.0697 | 0.9433 | 0.0983 | 0.8000 | 0.1658 |
| | E-net | 0.9850 | 0.0479 | 0.9633 | 0.0840 | 0.9433 | 0.0954 | 0.9150 | 0.1219 | 0.9867 | 0.0512 | 0.9467 | 0.0944 | 0.8100 | 0.1461 | 0.9600 | 0.0890 | 0.9067 | 0.1283 | 0.7250 | 0.1731 |
| | SCAD | 0.8900 | 0.2275 | 0.8900 | 0.2275 | 0.8950 | 0.2353 | 0.9417 | 0.1429 | 0.8833 | 0.2178 | 0.8533 | 0.2845 | 0.9183 | 0.1989 | 0.8967 | 0.2232 | 0.9017 | 0.2310 | 0.9267 | 0.1972 |
| | MCP | 0.9117 | 0.2002 | 0.8983 | 0.2308 | 0.9000 | 0.2439 | 0.9450 | 0.1320 | 0.8867 | 0.2271 | 0.8650 | 0.2810 | 0.9217 | 0.1827 | 0.9133 | 0.2216 | 0.9233 | 0.2189 | 0.9333 | 0.1925 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.8317 | 0.1526 | 0.8450 | 0.1576 | 0.8217 | 0.1729 | 0.8183 | 0.1573 | 0.8317 | 0.1633 | 0.8250 | 0.1747 | 0.8200 | 0.1934 | 0.8183 | 0.1710 | 0.8183 | 0.1726 | 0.8317 | 0.1633 |
| | BIC B | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9900 | 0.0463 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9850 | 0.0631 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | AIC SB | 0.8317 | 0.1526 | 0.8450 | 0.1576 | 0.8217 | 0.1729 | 0.8183 | 0.1573 | 0.8317 | 0.1633 | 0.8250 | 0.1747 | 0.8183 | 0.1926 | 0.8183 | 0.1710 | 0.8183 | 0.1726 | 0.8317 | 0.1633 |
| | BIC SB | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9900 | 0.0463 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9850 | 0.0631 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | AIC F | 0.8317 | 0.1526 | 0.8467 | 0.1601 | 0.8250 | 0.1698 | 0.8217 | 0.1540 | 0.8383 | 0.1525 | 0.8600 | 0.1530 | 0.8717 | 0.1399 | 0.8250 | 0.1613 | 0.8400 | 0.1640 | 0.8517 | 0.1551 |
| | BIC F | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9933 | 0.0328 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | AIC SF | 0.8317 | 0.1526 | 0.8483 | 0.1573 | 0.8250 | 0.1698 | 0.8217 | 0.1540 | 0.8383 | 0.1525 | 0.8600 | 0.1530 | 0.8717 | 0.1399 | 0.8250 | 0.1613 | 0.8400 | 0.1640 | 0.8517 | 0.1551 |
| | BIC SF | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9933 | 0.0328 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9933 | 0.0328 | 0.9767 | 0.0581 | 0.9567 | 0.0966 | 0.9317 | 0.1062 | 0.9883 | 0.0427 | 0.9683 | 0.0738 | 0.8733 | 0.1404 | 0.9900 | 0.0619 | 0.9333 | 0.1059 | 0.8267 | 0.1400 |
| | E-net | 0.9850 | 0.0479 | 0.9650 | 0.0796 | 0.9367 | 0.1155 | 0.9050 | 0.1237 | 0.9750 | 0.0598 | 0.9550 | 0.0849 | 0.8167 | 0.1633 | 0.9800 | 0.0760 | 0.8933 | 0.1287 | 0.7467 | 0.1411 |
| | SCAD | 0.8900 | 0.2275 | 0.9100 | 0.2057 | 0.8933 | 0.2375 | 0.9100 | 0.2030 | 0.8833 | 0.2278 | 0.8833 | 0.2363 | 0.9067 | 0.2083 | 0.9150 | 0.2165 | 0.8950 | 0.2458 | 0.9267 | 0.1915 |
| | MCP | 0.9117 | 0.2002 | 0.9183 | 0.1961 | 0.9133 | 0.2241 | 0.9100 | 0.1872 | 0.8983 | 0.2183 | 0.9033 | 0.2250 | 0.9083 | 0.2043 | 0.9250 | 0.2111 | 0.9117 | 0.2302 | 0.9317 | 0.1867 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC B | 0.8317 | 0.1526 | 0.8450 | 0.1576 | 0.8217 | 0.1729 | 0.8183 | 0.1573 | 0.8317 | 0.1633 | 0.8250 | 0.1747 | 0.8200 | 0.1934 | 0.8183 | 0.1710 | 0.8183 | 0.1726 | 0.8317 | 0.1633 |
| | BIC B | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9900 | 0.0463 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9850 | 0.0631 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | AIC SB | 0.8317 | 0.1526 | 0.8450 | 0.1576 | 0.8217 | 0.1729 | 0.8183 | 0.1573 | 0.8317 | 0.1633 | 0.8250 | 0.1747 | 0.8183 | 0.1926 | 0.8183 | 0.1710 | 0.8183 | 0.1726 | 0.8317 | 0.1633 |
| | BIC SB | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9900 | 0.0463 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9850 | 0.0631 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | AIC F | 0.8317 | 0.1526 | 0.8467 | 0.1601 | 0.8250 | 0.1698 | 0.8217 | 0.1540 | 0.8383 | 0.1525 | 0.8600 | 0.1530 | 0.8717 | 0.1399 | 0.8250 | 0.1613 | 0.8400 | 0.1640 | 0.8517 | 0.1551 |
| | BIC F | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9933 | 0.0328 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | AIC SF | 0.8317 | 0.1526 | 0.8483 | 0.1573 | 0.8250 | 0.1698 | 0.8217 | 0.1540 | 0.8383 | 0.1525 | 0.8600 | 0.1530 | 0.8717 | 0.1399 | 0.8250 | 0.1613 | 0.8400 | 0.1640 | 0.8517 | 0.1551 |
| | BIC SF | 0.9917 | 0.0365 | 0.9883 | 0.0489 | 0.9933 | 0.0328 | 0.9950 | 0.0371 | 0.9883 | 0.0427 | 0.9850 | 0.0535 | 0.9917 | 0.0435 | 0.9933 | 0.0328 | 0.9917 | 0.0365 | 0.9917 | 0.0365 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9933 | 0.0328 | 0.9767 | 0.0581 | 0.9567 | 0.0966 | 0.9317 | 0.1062 | 0.9883 | 0.0427 | 0.9683 | 0.0738 | 0.8733 | 0.1404 | 0.9900 | 0.0619 | 0.9333 | 0.1059 | 0.8267 | 0.1400 |
| | E-net | 0.9850 | 0.0479 | 0.9650 | 0.0796 | 0.9367 | 0.1155 | 0.9050 | 0.1237 | 0.9750 | 0.0598 | 0.9550 | 0.0849 | 0.8167 | 0.1633 | 0.9800 | 0.0760 | 0.8933 | 0.1287 | 0.7467 | 0.1411 |
| | SCAD | 0.8900 | 0.2275 | 0.9100 | 0.2057 | 0.8933 | 0.2375 | 0.9100 | 0.2030 | 0.8833 | 0.2278 | 0.8833 | 0.2363 | 0.9067 | 0.2083 | 0.9150 | 0.2165 | 0.8950 | 0.2458 | 0.9267 | 0.1915 |
| | MCP | 0.9117 | 0.2002 | 0.9183 | 0.1961 | 0.9133 | 0.2241 | 0.9100 | 0.1872 | 0.8983 | 0.2183 | 0.9033 | 0.2250 | 0.9083 | 0.2043 | 0.9250 | 0.2111 | 0.9117 | 0.2302 | 0.9317 | 0.1867 |

Table 35: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 1000$ and $p = 100$. See Figure 35 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.8329 | 0.0391 | 0.8362 | 0.0458 | 0.8345 | 0.0429 | 0.8382 | 0.0428 | 0.8299 | 0.0395 | 0.8538 | 0.0436 | 0.9081 | 0.0481 | 0.8422 | 0.0382 | 0.8484 | 0.0457 | 0.9079 | 0.0434 |
| | BIC F | 0.9905 | 0.0112 | 0.9928 | 0.0093 | 0.9929 | 0.0092 | 0.9920 | 0.0099 | 0.9907 | 0.0098 | 0.9927 | 0.0097 | 0.9959 | 0.0061 | 0.9896 | 0.0108 | 0.9930 | 0.0084 | 0.9972 | 0.0053 |
| | AIC SF | 0.8334 | 0.0389 | 0.8364 | 0.0459 | 0.8353 | 0.0424 | 0.8391 | 0.0430 | 0.8307 | 0.0390 | 0.8556 | 0.0421 | 0.9110 | 0.0455 | 0.8434 | 0.0372 | 0.8492 | 0.0452 | 0.9096 | 0.0429 |
| | BIC SF | 0.9905 | 0.0112 | 0.9928 | 0.0093 | 0.9929 | 0.0092 | 0.9920 | 0.0099 | 0.9907 | 0.0098 | 0.9929 | 0.0086 | 0.9959 | 0.0061 | 0.9896 | 0.0108 | 0.9930 | 0.0084 | 0.9972 | 0.0053 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9969 | 0.0087 | 0.9919 | 0.0163 | 0.9865 | 0.0191 | 0.9788 | 0.0231 | 0.9965 | 0.0093 | 0.9935 | 0.0125 | 0.9441 | 0.0307 | 0.9943 | 0.0104 | 0.9897 | 0.0153 | 0.9670 | 0.0227 |
| | E-net | 0.9943 | 0.0145 | 0.9874 | 0.0214 | 0.9788 | 0.0236 | 0.9655 | 0.0259 | 0.9944 | 0.0126 | 0.9885 | 0.0191 | 0.9329 | 0.0330 | 0.9919 | 0.0130 | 0.9842 | 0.0188 | 0.9595 | 0.0238 |
| | SCAD | 0.9791 | 0.0413 | 0.9829 | 0.0335 | 0.9875 | 0.0261 | 0.9972 | 0.0091 | 0.9834 | 0.0384 | 0.9832 | 0.0364 | 0.9693 | 0.0306 | 0.9825 | 0.0328 | 0.9851 | 0.0267 | 0.9805 | 0.0172 |
| | MCP | 0.9898 | 0.0211 | 0.9920 | 0.0165 | 0.9941 | 0.0178 | 0.9977 | 0.0083 | 0.9916 | 0.0223 | 0.9922 | 0.0189 | 0.9844 | 0.0165 | 0.9908 | 0.0203 | 0.9956 | 0.0101 | 0.9876 | 0.0140 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.8329 | 0.0391 | 0.8353 | 0.0419 | 0.8341 | 0.0421 | 0.8306 | 0.0481 | 0.8366 | 0.0447 | 0.8506 | 0.0408 | 0.9124 | 0.0434 | 0.8367 | 0.0438 | 0.8538 | 0.0428 | 0.9071 | 0.0505 |
| | BIC F | 0.9905 | 0.0112 | 0.9928 | 0.0099 | 0.9919 | 0.0087 | 0.9922 | 0.0088 | 0.9906 | 0.0098 | 0.9932 | 0.0076 | 0.9960 | 0.0061 | 0.9901 | 0.0103 | 0.9929 | 0.0087 | 0.9967 | 0.0071 |
| | AIC SF | 0.8334 | 0.0389 | 0.8364 | 0.0413 | 0.8354 | 0.0403 | 0.8316 | 0.0474 | 0.8377 | 0.0436 | 0.8530 | 0.0397 | 0.9152 | 0.0421 | 0.8390 | 0.0416 | 0.8548 | 0.0421 | 0.9080 | 0.0494 |
| | BIC SF | 0.9905 | 0.0112 | 0.9928 | 0.0099 | 0.9919 | 0.0087 | 0.9922 | 0.0088 | 0.9906 | 0.0098 | 0.9932 | 0.0076 | 0.9960 | 0.0061 | 0.9902 | 0.0100 | 0.9929 | 0.0087 | 0.9967 | 0.0071 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9969 | 0.0087 | 0.9936 | 0.0141 | 0.9882 | 0.0161 | 0.9788 | 0.0243 | 0.9960 | 0.0086 | 0.9954 | 0.0089 | 0.9436 | 0.0320 | 0.9943 | 0.0129 | 0.9874 | 0.0174 | 0.9696 | 0.0209 |
| | E-net | 0.9943 | 0.0145 | 0.9883 | 0.0195 | 0.9778 | 0.0222 | 0.9696 | 0.0268 | 0.9934 | 0.0124 | 0.9906 | 0.0145 | 0.9311 | 0.0361 | 0.9907 | 0.0168 | 0.9804 | 0.0229 | 0.9617 | 0.0225 |
| | SCAD | 0.9791 | 0.0413 | 0.9828 | 0.0353 | 0.9889 | 0.0207 | 0.9972 | 0.0082 | 0.9785 | 0.0443 | 0.9846 | 0.0384 | 0.9727 | 0.0277 | 0.9834 | 0.0349 | 0.9840 | 0.0310 | 0.9826 | 0.0174 |
| | MCP | 0.9898 | 0.0211 | 0.9915 | 0.0193 | 0.9962 | 0.0095 | 0.9984 | 0.0050 | 0.9911 | 0.0176 | 0.9931 | 0.0173 | 0.9850 | 0.0168 | 0.9895 | 0.0234 | 0.9928 | 0.0159 | 0.9900 | 0.0106 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.8329 | 0.0391 | 0.8353 | 0.0419 | 0.8341 | 0.0421 | 0.8306 | 0.0481 | 0.8366 | 0.0447 | 0.8506 | 0.0408 | 0.9124 | 0.0434 | 0.8367 | 0.0438 | 0.8538 | 0.0428 | 0.9071 | 0.0505 |
| | BIC F | 0.9905 | 0.0112 | 0.9928 | 0.0099 | 0.9919 | 0.0087 | 0.9922 | 0.0088 | 0.9906 | 0.0098 | 0.9932 | 0.0076 | 0.9960 | 0.0061 | 0.9901 | 0.0103 | 0.9929 | 0.0087 | 0.9967 | 0.0071 |
| | AIC SF | 0.8334 | 0.0389 | 0.8364 | 0.0413 | 0.8354 | 0.0403 | 0.8316 | 0.0474 | 0.8377 | 0.0436 | 0.8530 | 0.0397 | 0.9152 | 0.0421 | 0.8390 | 0.0416 | 0.8548 | 0.0421 | 0.9080 | 0.0494 |
| | BIC SF | 0.9905 | 0.0112 | 0.9928 | 0.0099 | 0.9919 | 0.0087 | 0.9922 | 0.0088 | 0.9906 | 0.0098 | 0.9932 | 0.0076 | 0.9960 | 0.0061 | 0.9902 | 0.0100 | 0.9929 | 0.0087 | 0.9967 | 0.0071 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9969 | 0.0087 | 0.9936 | 0.0141 | 0.9882 | 0.0161 | 0.9788 | 0.0243 | 0.9960 | 0.0086 | 0.9954 | 0.0089 | 0.9436 | 0.0320 | 0.9943 | 0.0129 | 0.9874 | 0.0174 | 0.9696 | 0.0209 |
| | E-net | 0.9943 | 0.0145 | 0.9883 | 0.0195 | 0.9778 | 0.0222 | 0.9696 | 0.0268 | 0.9934 | 0.0124 | 0.9906 | 0.0145 | 0.9311 | 0.0361 | 0.9907 | 0.0168 | 0.9804 | 0.0229 | 0.9617 | 0.0225 |
| | SCAD | 0.9791 | 0.0413 | 0.9828 | 0.0353 | 0.9889 | 0.0207 | 0.9972 | 0.0082 | 0.9785 | 0.0443 | 0.9846 | 0.0384 | 0.9727 | 0.0277 | 0.9834 | 0.0349 | 0.9840 | 0.0310 | 0.9826 | 0.0174 |
| | MCP | 0.9898 | 0.0211 | 0.9915 | 0.0193 | 0.9962 | 0.0095 | 0.9984 | 0.0050 | 0.9911 | 0.0176 | 0.9931 | 0.0173 | 0.9850 | 0.0168 | 0.9895 | 0.0234 | 0.9928 | 0.0159 | 0.9900 | 0.0106 |

Table 36: Mean and standard deviation of the $\beta$-specificity for the linear simulations when $n = 1000$ and $p = 2000$. See Figure 36 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0e + 00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0e + 00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9999 | 3e − 04 | 0.9992 | 0.0012 | 0.9977 | 0.0022 | 0.9973 | 0.0019 | 0.9997 | 0.0008 | 0.9994 | 0.0015 | 0.9886 | 0.0052 | 0.9998 | 6e − 04 | 0.9991 | 0.0015 | 0.9949 | 0.0021 |
| | E-net | 0.9998 | 4e − 04 | 0.9985 | 0.0017 | 0.9964 | 0.0025 | 0.9959 | 0.0022 | 0.9996 | 0.0011 | 0.9990 | 0.0019 | 0.9863 | 0.0058 | 0.9996 | 8e − 04 | 0.9985 | 0.0019 | 0.9938 | 0.0023 |
| | SCAD | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0001 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | MCP | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0001 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| 3 | Ridge | 0.0000 | 0e + 00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0e + 00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9999 | 3e − 04 | 0.9991 | 0.0013 | 0.9977 | 0.0018 | 0.9974 | 0.0020 | 0.9997 | 0.0009 | 0.9995 | 0.0011 | 0.9890 | 0.0048 | 0.9998 | 6e − 04 | 0.9991 | 0.0012 | 0.9949 | 0.0024 |
| | E-net | 0.9998 | 4e − 04 | 0.9985 | 0.0017 | 0.9963 | 0.0022 | 0.9962 | 0.0024 | 0.9995 | 0.0011 | 0.9991 | 0.0016 | 0.9867 | 0.0052 | 0.9996 | 9e − 04 | 0.9985 | 0.0016 | 0.9938 | 0.0027 |
| | SCAD | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0001 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | MCP | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0001 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| 6 | Ridge | 0.0000 | 0e + 00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0e + 00 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9999 | 3e − 04 | 0.9991 | 0.0013 | 0.9977 | 0.0018 | 0.9974 | 0.0020 | 0.9997 | 0.0009 | 0.9995 | 0.0011 | 0.9890 | 0.0048 | 0.9998 | 6e − 04 | 0.9991 | 0.0012 | 0.9949 | 0.0024 |
| | E-net | 0.9998 | 4e − 04 | 0.9985 | 0.0017 | 0.9963 | 0.0022 | 0.9962 | 0.0024 | 0.9996 | 0.0010 | 0.9991 | 0.0016 | 0.9867 | 0.0052 | 0.9996 | 9e − 04 | 0.9985 | 0.0016 | 0.9938 | 0.0027 |
| | SCAD | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0001 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | MCP | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0001 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0e + 00 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |

# 5 Tables from the non-linear simulations

## 5.1 Tables for the training MSE of the non-linear simulations

Table 37: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 50$ and $p = 10$. See Figure 37 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 4.99 | 1.44 | 5.39 | 1.30 | 5.24 | 1.51 | 5.73 | 1.58 | 5.06 | 1.24 | 4.99 | 1.17 | 5.13 | 1.55 | 5.06 | 1.35 | 4.98 | 1.34 | 5.12 | 1.54 |
| | AIC B | 5.31 | 1.59 | 5.73 | 1.40 | 5.60 | 1.62 | 6.14 | 1.70 | 5.39 | 1.33 | 5.30 | 1.26 | 5.45 | 1.68 | 5.37 | 1.47 | 5.28 | 1.43 | 5.45 | 1.69 |
| | BIC B | 5.68 | 1.69 | 6.11 | 1.51 | 5.95 | 1.64 | 6.57 | 1.80 | 5.76 | 1.42 | 5.70 | 1.38 | 5.74 | 1.71 | 5.84 | 1.56 | 5.63 | 1.64 | 5.84 | 1.76 |
| | AIC SB | 5.31 | 1.59 | 5.73 | 1.40 | 5.60 | 1.62 | 6.14 | 1.70 | 5.39 | 1.33 | 5.30 | 1.26 | 5.45 | 1.68 | 5.37 | 1.47 | 5.28 | 1.43 | 5.44 | 1.69 |
| | BIC SB | 5.68 | 1.69 | 6.11 | 1.51 | 5.94 | 1.64 | 6.57 | 1.81 | 5.76 | 1.42 | 5.70 | 1.38 | 5.74 | 1.71 | 5.85 | 1.58 | 5.63 | 1.64 | 5.84 | 1.76 |
| | AIC F | 5.33 | 1.60 | 5.81 | 1.42 | 5.64 | 1.61 | 6.29 | 1.71 | 5.41 | 1.35 | 5.41 | 1.27 | 5.62 | 1.69 | 5.41 | 1.48 | 5.38 | 1.59 | 5.55 | 1.70 |
| | BIC F | 5.72 | 1.68 | 6.22 | 1.60 | 6.00 | 1.64 | 6.65 | 1.81 | 5.82 | 1.44 | 5.78 | 1.34 | 5.93 | 1.74 | 5.92 | 1.59 | 5.72 | 1.65 | 5.94 | 1.83 |
| | AIC SF | 5.33 | 1.60 | 5.81 | 1.42 | 5.65 | 1.61 | 6.29 | 1.71 | 5.42 | 1.35 | 5.41 | 1.27 | 5.64 | 1.69 | 5.41 | 1.48 | 5.38 | 1.59 | 5.58 | 1.71 |
| | BIC SF | 5.72 | 1.68 | 6.22 | 1.60 | 6.00 | 1.64 | 6.66 | 1.81 | 5.82 | 1.44 | 5.77 | 1.34 | 5.95 | 1.75 | 5.92 | 1.59 | 5.72 | 1.65 | 5.99 | 1.83 |
| | Ridge | 7.64 | 3.48 | 8.36 | 2.98 | 8.33 | 3.11 | 9.20 | 3.19 | 7.48 | 2.40 | 7.55 | 2.84 | 8.30 | 3.01 | 7.58 | 2.72 | 7.80 | 2.91 | 8.03 | 3.01 |
| | Lasso | 7.86 | 2.77 | 8.28 | 2.54 | 7.77 | 2.58 | 8.23 | 2.86 | 7.79 | 2.17 | 7.47 | 2.24 | 7.37 | 2.65 | 7.91 | 2.72 | 7.41 | 2.45 | 7.25 | 2.87 |
| | E-net | 7.87 | 2.80 | 8.29 | 2.55 | 7.74 | 2.57 | 8.27 | 2.85 | 7.81 | 2.20 | 7.45 | 2.26 | 7.39 | 2.68 | 7.91 | 2.72 | 7.41 | 2.50 | 7.27 | 2.90 |
| | SCAD | 5.80 | 1.79 | 6.30 | 1.57 | 6.01 | 1.82 | 6.60 | 1.87 | 5.95 | 1.55 | 5.85 | 1.39 | 5.84 | 1.81 | 5.97 | 1.76 | 5.88 | 1.67 | 5.74 | 1.97 |
| | MCP | 5.85 | 1.83 | 6.44 | 1.62 | 6.07 | 1.90 | 6.59 | 1.90 | 5.98 | 1.62 | 5.88 | 1.38 | 5.82 | 1.87 | 6.05 | 1.77 | 5.95 | 1.72 | 5.84 | 2.04 |
| | XGBoost | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.02 | 0.01 | 0.02 | 0.02 |
| | RF | 1.39 | 0.28 | 1.35 | 0.34 | 1.14 | 0.33 | 0.67 | 0.24 | 1.34 | 0.27 | 1.36 | 0.29 | 1.00 | 0.24 | 1.37 | 0.29 | 1.29 | 0.29 | 1.11 | 0.25 |
| | SVM | 0.76 | 0.70 | 0.89 | 0.97 | 1.07 | 0.90 | 1.62 | 0.80 | 0.78 | 0.65 | 0.96 | 0.88 | 1.55 | 0.84 | 0.94 | 1.01 | 1.03 | 0.87 | 1.72 | 0.81 |
| 3 | OLS | 124.27 | 64.80 | 135.92 | 64.28 | 127.72 | 68.62 | 121.50 | 63.02 | 122.36 | 63.24 | 133.23 | 68.31 | 123.59 | 69.03 | 131.64 | 65.01 | 129.48 | 64.95 | 116.63 | 60.41 |
| | AIC B | 133.48 | 68.73 | 145.07 | 68.00 | 136.72 | 72.97 | 130.26 | 67.08 | 131.53 | 67.67 | 142.74 | 75.11 | 132.31 | 75.35 | 141.40 | 69.78 | 139.36 | 71.13 | 124.53 | 63.52 |
| | BIC B | 145.55 | 73.75 | 154.50 | 70.24 | 146.54 | 77.60 | 140.04 | 71.30 | 141.99 | 72.15 | 153.22 | 80.08 | 140.37 | 77.29 | 151.40 | 76.37 | 149.22 | 76.75 | 131.44 | 67.45 |
| | AIC SB | 133.44 | 68.74 | 145.07 | 68.00 | 136.72 | 72.97 | 130.21 | 67.09 | 131.52 | 67.67 | 142.40 | 74.52 | 132.26 | 75.37 | 141.33 | 69.77 | 139.19 | 71.18 | 124.47 | 63.51 |
| | BIC SB | 145.55 | 73.75 | 154.50 | 70.24 | 146.46 | 77.70 | 139.94 | 71.34 | 142.18 | 72.90 | 153.00 | 80.20 | 140.35 | 77.33 | 151.15 | 75.96 | 149.22 | 76.75 | 131.44 | 67.45 |
| | AIC F | 135.07 | 69.26 | 146.71 | 68.72 | 139.23 | 73.61 | 134.89 | 70.30 | 133.13 | 68.46 | 145.07 | 76.04 | 137.22 | 74.71 | 143.53 | 72.56 | 142.83 | 74.94 | 130.03 | 67.10 |
| | BIC F | 146.57 | 73.44 | 156.20 | 70.40 | 150.31 | 78.23 | 145.12 | 73.00 | 143.09 | 74.12 | 155.87 | 80.64 | 147.05 | 89.22 | 152.87 | 76.04 | 153.72 | 80.50 | 136.05 | 72.54 |
| | AIC SF | 135.07 | 69.26 | 146.71 | 68.72 | 139.22 | 73.61 | 134.94 | 70.32 | 133.17 | 68.44 | 145.12 | 76.01 | 137.80 | 76.42 | 143.55 | 72.54 | 142.84 | 74.94 | 130.06 | 66.97 |
| | BIC SF | 146.57 | 73.44 | 156.20 | 70.40 | 150.53 | 78.28 | 145.20 | 73.01 | 143.09 | 74.12 | 155.87 | 80.64 | 147.52 | 89.38 | 152.87 | 76.04 | 153.76 | 80.45 | 136.06 | 72.53 |
| | Ridge | 223.67 | 106.71 | 247.35 | 114.68 | 231.15 | 115.10 | 216.51 | 134.88 | 218.74 | 106.89 | 243.97 | 119.13 | 224.39 | 141.49 | 235.39 | 114.43 | 235.95 | 113.27 | 204.80 | 98.73 |
| | Lasso | 218.27 | 107.62 | 240.70 | 113.58 | 220.12 | 113.39 | 203.41 | 134.69 | 213.30 | 108.40 | 234.30 | 116.17 | 213.44 | 143.05 | 227.29 | 118.06 | 228.26 | 113.63 | 195.77 | 99.27 |
| | E-net | 219.18 | 107.79 | 241.24 | 113.95 | 220.23 | 113.20 | 203.41 | 135.57 | 214.21 | 108.06 | 234.77 | 115.76 | 213.59 | 142.52 | 228.60 | 117.65 | 228.71 | 113.68 | 195.84 | 99.28 |
| | SCAD | 152.31 | 85.32 | 164.37 | 83.14 | 155.41 | 90.77 | 142.84 | 79.66 | 151.87 | 90.15 | 162.55 | 93.73 | 146.79 | 90.47 | 161.90 | 84.44 | 155.95 | 89.31 | 136.91 | 74.17 |
| | MCP | 152.32 | 81.54 | 163.86 | 81.56 | 152.53 | 86.65 | 141.02 | 78.10 | 152.52 | 85.68 | 164.39 | 95.01 | 145.66 | 90.12 | 162.04 | 82.69 | 158.48 | 91.53 | 136.89 | 73.93 |
| | XGBoost | 0.10 | 0.11 | 0.10 | 0.11 | 0.14 | 0.14 | 0.09 | 0.15 | 0.12 | 0.13 | 0.13 | 0.12 | 0.13 | 0.15 | 0.11 | 0.11 | 0.12 | 0.13 | 0.15 | 0.19 |
| | RF | 24.58 | 11.30 | 26.67 | 14.08 | 23.51 | 11.68 | 14.02 | 12.41 | 23.28 | 12.36 | 24.84 | 13.01 | 17.75 | 13.42 | 26.16 | 14.39 | 24.25 | 10.80 | 17.43 | 7.05 |
| | SVM | 20.03 | 18.12 | 24.13 | 25.99 | 21.94 | 33.49 | 22.33 | 40.56 | 19.42 | 25.55 | 20.06 | 19.43 | 20.41 | 40.37 | 23.12 | 23.95 | 20.07 | 19.90 | 17.79 | 19.71 |
| 6 | OLS | 1862.10 | 1007.22 | 2043.56 | 1008.78 | 1897.59 | 1077.30 | 1796.53 | 968.68 | 1834.81 | 1012.53 | 2000.52 | 1052.33 | 1853.66 | 1054.10 | 1986.77 | 1043.11 | 1962.07 | 1032.92 | 1728.95 | 941.85 |
| | AIC B | 2020.38 | 1082.74 | 2197.58 | 1078.92 | 2051.35 | 1179.20 | 1922.67 | 1026.71 | 1984.03 | 1104.50 | 2161.73 | 1153.92 | 1980.64 | 1124.63 | 2145.73 | 1133.12 | 2101.71 | 1096.03 | 1847.13 | 993.27 |
| | BIC B | 2188.99 | 1156.36 | 2369.72 | 1162.31 | 2190.12 | 1210.93 | 2071.96 | 1119.25 | 2150.02 | 1236.62 | 2321.75 | 1249.56 | 2100.63 | 1155.00 | 2309.91 | 1226.73 | 2272.28 | 1233.88 | 1967.21 | 1062.66 |
| | AIC SB | 2017.39 | 1077.21 | 2197.58 | 1078.92 | 2050.88 | 1178.59 | 1921.64 | 1025.53 | 1980.99 | 1096.71 | 2157.83 | 1149.88 | 1979.34 | 1123.34 | 2142.84 | 1131.17 | 2101.71 | 1096.03 | 1846.56 | 993.65 |
| | BIC SB | 2188.99 | 1156.36 | 2369.72 | 1162.31 | 2190.12 | 1210.93 | 2068.66 | 1115.90 | 2148.46 | 1237.76 | 2315.87 | 1236.87 | 2099.27 | 1156.20 | 2306.07 | 1227.36 | 2268.56 | 1233.10 | 1965.53 | 1062.55 |
| | AIC F | 2038.74 | 1075.83 | 2243.78 | 1115.76 | 2098.40 | 1189.68 | 2012.68 | 1095.66 | 1995.88 | 1101.20 | 2194.35 | 1169.05 | 2090.45 | 1283.45 | 2179.63 | 1152.23 | 2165.66 | 1152.33 | 1915.58 | 1087.42 |
| | BIC F | 2214.93 | 1165.89 | 2417.29 | 1205.08 | 2265.88 | 1240.92 | 2164.77 | 1178.25 | 2168.97 | 1233.87 | 2339.38 | 1235.98 | 2182.46 | 1284.83 | 2320.72 | 1231.95 | 2313.72 | 1249.85 | 2032.92 | 1132.30 |
| | AIC SF | 2039.41 | 1077.35 | 2244.43 | 1115.40 | 2101.31 | 1191.36 | 2014.72 | 1098.59 | 1995.85 | 1101.23 | 2195.56 | 1169.31 | 2094.56 | 1287.42 | 2179.86 | 1152.09 | 2170.95 | 1156.95 | 1916.98 | 1087.32 |
| | BIC SF | 2215.99 | 1165.90 | 2420.57 | 1205.39 | 2265.88 | 1240.92 | 2166.64 | 1178.20 | 2168.97 | 1233.87 | 2339.38 | 1235.98 | 2184.35 | 1288.72 | 2320.72 | 1231.95 | 2313.72 | 1249.85 | 2032.92 | 1132.30 |
| | Ridge | 2885.95 | 1357.52 | 3182.05 | 1589.38 | 3041.98 | 1591.92 | 2892.60 | 1740.08 | 2745.67 | 1446.67 | 3040.68 | 1461.47 | 2917.16 | 1786.44 | 3000.91 | 1544.14 | 3000.55 | 1379.77 | 2633.77 | 1239.07 |
| | Lasso | 2870.99 | 1364.95 | 3162.46 | 1575.78 | 3008.76 | 1606.59 | 2824.02 | 1744.41 | 2736.25 | 1479.32 | 3029.87 | 1470.26 | 2840.51 | 1773.61 | 2979.42 | 1545.15 | 2977.84 | 1393.19 | 2608.21 | 1239.09 |
| | E-net | 2872.60 | 1364.24 | 3162.07 | 1575.29 | 3009.54 | 1605.92 | 2831.42 | 1745.29 | 2737.47 | 1480.41 | 3031.03 | 1469.41 | 2842.09 | 1770.13 | 2981.29 | 1545.76 | 2980.05 | 1391.27 | 2612.46 | 1240.03 |
| | SCAD | 2405.07 | 1328.00 | 2581.99 | 1318.44 | 2394.16 | 1465.81 | 2205.05 | 1218.54 | 2347.47 | 1392.65 | 2581.78 | 1511.93 | 2360.42 | 1703.17 | 2600.94 | 1495.54 | 2468.32 | 1358.00 | 2115.69 | 1181.53 |
| | MCP | 2414.44 | 1359.68 | 2594.76 | 1323.94 | 2372.18 | 1466.15 | 2170.21 | 1197.48 | 2346.58 | 1433.23 | 2599.57 | 1515.14 | 2359.86 | 1770.47 | 2623.59 | 1511.00 | 2456.60 | 1376.18 | 2113.73 | 1148.27 |
| | XGBoost | 0.47 | 0.49 | 0.58 | 0.63 | 0.54 | 0.65 | 0.17 | 0.40 | 0.56 | 0.68 | 0.63 | 0.64 | 0.37 | 0.60 | 0.55 | 0.51 | 0.61 | 0.65 | 0.88 | 0.98 |
| | RF | 280.08 | 171.08 | 312.67 | 222.88 | 269.55 | 172.59 | 173.35 | 168.22 | 268.82 | 194.95 | 282.22 | 196.52 | 202.16 | 203.21 | 314.01 | 230.89 | 273.35 | 155.01 | 181.81 | 103.66 |
| | SVM | 356.60 | 312.30 | 445.53 | 467.92 | 366.90 | 462.03 | 274.82 | 516.44 | 369.59 | 416.54 | 346.19 | 304.63 | 304.26 | 565.89 | 426.13 | 411.65 | 322.24 | 290.62 | 221.87 | 230.09 |

Table 38: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 50$ and $p = 100$. See Figure 38 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 21.17 | 4.23 | 18.23 | 4.54 | 15.12 | 3.32 | 10.38 | 2.77 | 21.14 | 4.32 | 21.67 | 4.59 | 19.51 | 3.57 | 19.35 | 4.06 | 16.87 | 3.17 | 12.78 | 2.57 |
| | Lasso | 9.28 | 3.07 | 8.42 | 3.42 | 7.71 | 3.24 | 8.00 | 2.89 | 9.29 | 2.90 | 8.58 | 2.63 | 8.55 | 2.98 | 8.22 | 2.61 | 7.77 | 2.04 | 8.27 | 3.46 |
| | E-net | 9.51 | 3.19 | 8.37 | 3.41 | 7.53 | 3.30 | 8.03 | 2.84 | 9.50 | 3.10 | 8.71 | 2.69 | 8.62 | 3.01 | 8.29 | 2.62 | 7.73 | 2.06 | 8.31 | 3.42 |
| | SCAD | 5.52 | 1.69 | 5.30 | 1.85 | 6.05 | 2.16 | 7.10 | 2.02 | 5.49 | 1.55 | 5.40 | 1.63 | 6.42 | 2.40 | 5.00 | 1.48 | 5.80 | 1.56 | 7.10 | 2.69 |
| | MCP | 6.08 | 1.86 | 5.89 | 1.99 | 6.26 | 2.30 | 6.76 | 1.95 | 6.11 | 1.70 | 5.90 | 1.58 | 6.78 | 2.61 | 5.52 | 1.62 | 6.05 | 1.55 | 6.90 | 2.51 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 1.78 | 0.39 | 1.78 | 0.43 | 1.50 | 0.34 | 0.80 | 0.23 | 1.91 | 0.41 | 1.87 | 0.41 | 1.21 | 0.34 | 1.72 | 0.33 | 1.44 | 0.36 | 0.73 | 0.19 |
| | SVM | 0.96 | 1.68 | 0.73 | 1.55 | 0.70 | 0.86 | 1.66 | 1.89 | 1.04 | 1.57 | 0.55 | 0.68 | 0.53 | 0.34 | 0.42 | 0.43 | 0.50 | 0.58 | 0.79 | 0.60 |
| 3 | Ridge | 253.54 | 94.40 | 269.66 | 99.81 | 237.16 | 87.14 | 239.19 | 156.69 | 261.68 | 89.40 | 256.18 | 95.45 | 298.23 | 150.34 | 264.52 | 107.19 | 265.06 | 97.08 | 240.03 | 117.28 |
| | Lasso | 224.64 | 109.91 | 235.80 | 109.35 | 209.33 | 89.47 | 204.33 | 111.96 | 229.66 | 106.29 | 213.10 | 102.11 | 250.77 | 154.69 | 225.53 | 112.53 | 228.08 | 108.81 | 212.21 | 112.69 |
| | E-net | 226.07 | 109.27 | 236.65 | 109.41 | 208.81 | 90.00 | 205.93 | 113.35 | 231.28 | 105.88 | 215.51 | 101.78 | 251.11 | 155.17 | 227.48 | 111.89 | 229.59 | 108.69 | 211.92 | 112.27 |
| | SCAD | 143.36 | 93.27 | 139.03 | 73.26 | 140.05 | 64.13 | 148.31 | 75.22 | 149.03 | 90.06 | 132.43 | 79.61 | 170.90 | 111.00 | 142.07 | 91.14 | 156.99 | 84.70 | 144.76 | 79.93 |
| | MCP | 154.31 | 94.91 | 146.21 | 72.06 | 148.33 | 70.23 | 146.55 | 78.65 | 163.22 | 86.75 | 143.63 | 82.88 | 176.43 | 126.36 | 157.98 | 96.40 | 159.22 | 86.86 | 142.52 | 80.89 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 30.44 | 13.12 | 31.26 | 12.92 | 26.29 | 9.26 | 14.55 | 12.46 | 30.55 | 13.34 | 29.23 | 11.97 | 23.53 | 13.25 | 31.24 | 15.28 | 28.40 | 12.11 | 14.44 | 6.83 |
| | SVM | 58.71 | 68.90 | 36.88 | 43.21 | 30.42 | 36.86 | 23.71 | 36.03 | 53.58 | 61.39 | 43.98 | 50.74 | 36.95 | 52.03 | 52.41 | 65.03 | 33.87 | 38.63 | 19.60 | 19.71 |
| 6 | Ridge | 2805.40 | 1370.59 | 2956.79 | 1314.56 | 2708.13 | 1120.15 | 2986.54 | 1830.14 | 2926.73 | 1307.91 | 2744.40 | 1335.18 | 3288.13 | 1816.80 | 2883.26 | 1484.25 | 2929.04 | 1229.20 | 2817.89 | 1464.83 |
| | Lasso | 2752.69 | 1416.53 | 2890.98 | 1373.20 | 2647.54 | 1122.18 | 2890.52 | 1843.63 | 2886.09 | 1349.68 | 2672.10 | 1324.47 | 3194.62 | 1871.34 | 2828.19 | 1460.26 | 2897.90 | 1256.91 | 2732.31 | 1494.43 |
| | E-net | 2755.87 | 1413.32 | 2895.17 | 1367.69 | 2649.52 | 1124.19 | 2884.31 | 1837.15 | 2885.11 | 1350.46 | 2675.10 | 1325.90 | 3197.39 | 1870.31 | 2834.54 | 1466.71 | 2899.24 | 1255.40 | 2736.15 | 1493.70 |
| | SCAD | 2378.51 | 1494.70 | 2388.80 | 1243.87 | 2162.57 | 993.13 | 2277.18 | 1309.12 | 2439.46 | 1310.85 | 2204.64 | 1271.40 | 2743.75 | 1821.86 | 2342.91 | 1433.83 | 2495.77 | 1324.98 | 2182.22 | 1299.63 |
| | MCP | 2412.77 | 1484.35 | 2468.95 | 1334.72 | 2208.60 | 981.77 | 2282.24 | 1311.80 | 2517.08 | 1315.58 | 2272.11 | 1297.71 | 2827.36 | 1852.01 | 2438.19 | 1473.16 | 2570.48 | 1363.84 | 2227.68 | 1309.96 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 |
| | RF | 346.70 | 188.20 | 358.40 | 186.65 | 291.61 | 127.37 | 182.32 | 173.90 | 343.79 | 179.97 | 333.49 | 169.24 | 286.66 | 186.07 | 356.90 | 240.74 | 325.55 | 158.20 | 184.85 | 104.28 |
| | SVM | 1138.38 | 1179.01 | 844.60 | 698.41 | 608.97 | 604.71 | 327.06 | 483.30 | 1152.75 | 1015.63 | 995.55 | 857.16 | 746.94 | 758.20 | 897.00 | 794.44 | 663.99 | 616.21 | 294.14 | 243.82 |

Table 39: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 50$ and $p = 2000$. See Figure 39 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 20.66 | 3.99 | 19.50 | 4.37 | 14.57 | 3.13 | 9.98 | 2.45 | 22.93 | 4.38 | 26.01 | 5.28 | 33.54 | 12.39 | 23.09 | 7.24 | 14.32 | 9.15 | 7.95 | 3.61 |
| | Lasso | 12.85 | 4.72 | 9.54 | 4.18 | 7.39 | 3.38 | 6.95 | 2.77 | 11.61 | 4.68 | 12.20 | 4.64 | 8.82 | 3.52 | 10.78 | 4.06 | 8.93 | 3.58 | 8.59 | 3.26 |
| | E-net | 13.25 | 4.92 | 9.65 | 4.29 | 7.26 | 3.34 | 7.04 | 2.71 | 12.23 | 4.71 | 12.71 | 4.76 | 8.96 | 3.64 | 11.12 | 4.08 | 9.01 | 3.69 | 8.64 | 3.17 |
| | SCAD | 4.23 | 3.44 | 4.31 | 2.35 | 5.35 | 1.89 | 6.48 | 1.89 | 3.70 | 2.18 | 4.22 | 3.06 | 5.74 | 3.36 | 4.07 | 2.26 | 5.47 | 2.87 | 7.68 | 2.22 |
| | MCP | 6.39 | 3.33 | 5.92 | 3.14 | 6.25 | 2.67 | 6.14 | 2.07 | 5.88 | 2.57 | 6.38 | 3.07 | 6.98 | 3.09 | 5.76 | 2.16 | 6.57 | 2.89 | 7.67 | 2.15 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 2.43 | 0.50 | 2.38 | 0.47 | 1.93 | 0.43 | 0.89 | 0.35 | 2.61 | 0.53 | 2.77 | 0.50 | 1.56 | 0.46 | 2.40 | 0.41 | 1.93 | 0.46 | 0.91 | 0.25 |
| | SVM | 5.68 | 4.16 | 0.89 | 1.26 | 0.91 | 2.00 | 1.19 | 0.96 | 5.96 | 4.61 | 5.22 | 4.91 | 3.60 | 4.94 | 2.07 | 3.20 | 0.76 | 0.99 | 0.58 | 0.26 |
| 3 | Ridge | 255.72 | 92.72 | 247.88 | 101.88 | 246.54 | 167.91 | 183.63 | 93.86 | 266.56 | 101.86 | 292.56 | 110.53 | 315.70 | 114.57 | 277.19 | 105.13 | 282.13 | 128.52 | 261.19 | 144.77 |
| | Lasso | 237.57 | 99.07 | 223.76 | 118.52 | 232.28 | 176.44 | 194.98 | 107.90 | 244.57 | 106.76 | 263.57 | 127.72 | 235.20 | 112.50 | 255.07 | 111.72 | 251.74 | 134.69 | 235.35 | 134.15 |
| | E-net | 237.70 | 98.12 | 225.38 | 117.38 | 233.39 | 175.72 | 195.73 | 110.17 | 246.22 | 106.74 | 265.46 | 126.95 | 237.94 | 112.56 | 257.25 | 110.60 | 254.37 | 134.78 | 235.29 | 134.60 |
| | SCAD | 131.50 | 95.23 | 111.68 | 92.23 | 138.83 | 132.94 | 134.27 | 67.73 | 121.28 | 104.14 | 157.07 | 137.22 | 128.12 | 101.80 | 143.69 | 116.66 | 144.02 | 101.72 | 146.10 | 101.22 |
| | MCP | 169.99 | 87.95 | 146.45 | 102.51 | 165.43 | 148.72 | 128.59 | 63.32 | 157.74 | 95.39 | 190.57 | 127.59 | 148.64 | 103.55 | 178.03 | 111.33 | 172.30 | 115.86 | 148.86 | 106.49 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 35.91 | 15.17 | 32.96 | 14.36 | 32.16 | 19.34 | 14.17 | 8.49 | 35.92 | 15.09 | 39.63 | 17.66 | 28.24 | 13.14 | 37.99 | 14.94 | 34.86 | 15.76 | 19.79 | 11.95 |
| | SVM | 89.13 | 71.20 | 49.59 | 56.16 | 46.51 | 108.08 | 23.95 | 23.35 | 85.41 | 69.48 | 107.43 | 87.05 | 68.93 | 66.57 | 76.18 | 78.49 | 42.96 | 54.67 | 35.92 | 40.38 |
| 6 | Ridge | 2884.31 | 1399.75 | 2746.91 | 1471.40 | 3017.19 | 2203.84 | 2712.98 | 1447.81 | 2945.46 | 1447.33 | 3187.68 | 1611.33 | 3015.48 | 1344.65 | 3061.06 | 1374.43 | 3154.60 | 1629.71 | 3195.81 | 1665.16 |
| | Lasso | 2867.82 | 1417.33 | 2714.19 | 1482.57 | 2965.28 | 2226.62 | 2776.50 | 1464.78 | 2921.52 | 1420.56 | 3158.87 | 1637.92 | 2924.56 | 1403.81 | 3052.96 | 1379.57 | 3068.64 | 1611.36 | 3064.39 | 1619.99 |
| | E-net | 2868.54 | 1416.42 | 2715.16 | 1482.98 | 2965.26 | 2227.04 | 2777.80 | 1466.78 | 2920.52 | 1418.12 | 3163.00 | 1633.87 | 2925.73 | 1393.64 | 3053.35 | 1378.57 | 3063.19 | 1614.59 | 3070.39 | 1619.08 |
| | SCAD | 2276.15 | 1288.79 | 1958.15 | 1480.84 | 2282.01 | 2162.10 | 2141.11 | 1197.20 | 2246.09 | 1372.95 | 2639.24 | 1771.50 | 2303.92 | 1357.95 | 2490.74 | 1609.80 | 2440.99 | 1599.40 | 2417.30 | 1522.17 |
| | MCP | 2586.58 | 1405.10 | 2264.54 | 1534.37 | 2596.35 | 2238.76 | 2172.68 | 1258.89 | 2481.90 | 1292.35 | 2873.81 | 1661.94 | 2458.89 | 1380.57 | 2683.91 | 1469.44 | 2659.41 | 1581.03 | 2380.36 | 1535.59 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 425.65 | 228.30 | 387.34 | 221.97 | 387.81 | 284.31 | 180.77 | 119.19 | 430.55 | 224.50 | 474.97 | 256.86 | 374.64 | 198.94 | 448.81 | 208.36 | 428.16 | 228.67 | 273.18 | 169.09 |
| | SVM | 1172.60 | 899.29 | 824.39 | 783.21 | 714.66 | 916.82 | 318.50 | 280.42 | 1087.68 | 929.10 | 1528.14 | 1142.17 | 1045.45 | 935.40 | 1062.54 | 928.32 | 1052.72 | 1111.37 | 850.84 | 858.21 |

Table 40: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 200$ and $p = 10$. See Figure 40 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 6.26 | 0.63 | 6.43 | 0.74 | 6.34 | 0.69 | 7.11 | 1.03 | 6.31 | 0.81 | 6.29 | 0.70 | 6.42 | 0.81 | 6.32 | 0.80 | 6.22 | 0.68 | 6.23 | 0.83 |
| | AIC B | 6.35 | 0.64 | 6.52 | 0.76 | 6.43 | 0.70 | 7.23 | 1.04 | 6.40 | 0.83 | 6.38 | 0.71 | 6.50 | 0.82 | 6.41 | 0.82 | 6.30 | 0.70 | 6.32 | 0.84 |
| | BIC B | 6.54 | 0.67 | 6.69 | 0.80 | 6.57 | 0.72 | 7.38 | 1.07 | 6.57 | 0.86 | 6.53 | 0.74 | 6.63 | 0.86 | 6.57 | 0.86 | 6.45 | 0.72 | 6.45 | 0.87 |
| | AIC SB | 6.35 | 0.64 | 6.52 | 0.76 | 6.43 | 0.70 | 7.23 | 1.04 | 6.40 | 0.83 | 6.38 | 0.71 | 6.50 | 0.82 | 6.41 | 0.82 | 6.30 | 0.70 | 6.32 | 0.84 |
| | BIC SB | 6.54 | 0.67 | 6.69 | 0.80 | 6.57 | 0.72 | 7.38 | 1.07 | 6.57 | 0.86 | 6.53 | 0.74 | 6.63 | 0.86 | 6.57 | 0.86 | 6.45 | 0.72 | 6.45 | 0.87 |
| | AIC F | 6.35 | 0.64 | 6.52 | 0.76 | 6.43 | 0.70 | 7.24 | 1.04 | 6.40 | 0.83 | 6.39 | 0.71 | 6.52 | 0.83 | 6.41 | 0.82 | 6.31 | 0.69 | 6.33 | 0.86 |
| | BIC F | 6.54 | 0.67 | 6.69 | 0.80 | 6.58 | 0.72 | 7.39 | 1.07 | 6.57 | 0.86 | 6.54 | 0.75 | 6.65 | 0.86 | 6.58 | 0.86 | 6.47 | 0.73 | 6.46 | 0.87 |
| | AIC SF | 6.35 | 0.64 | 6.52 | 0.76 | 6.43 | 0.70 | 7.24 | 1.04 | 6.40 | 0.83 | 6.39 | 0.71 | 6.52 | 0.83 | 6.41 | 0.82 | 6.31 | 0.69 | 6.33 | 0.86 |
| | BIC SF | 6.54 | 0.67 | 6.69 | 0.80 | 6.58 | 0.72 | 7.39 | 1.07 | 6.57 | 0.86 | 6.54 | 0.75 | 6.65 | 0.86 | 6.58 | 0.86 | 6.47 | 0.73 | 6.46 | 0.87 |
| | Ridge | 7.08 | 0.77 | 7.36 | 0.97 | 7.32 | 0.90 | 8.61 | 1.36 | 7.17 | 1.05 | 7.26 | 1.01 | 7.80 | 1.22 | 7.27 | 1.05 | 7.17 | 0.97 | 7.50 | 1.16 |
| | Lasso | 7.36 | 0.84 | 7.52 | 1.01 | 7.26 | 0.90 | 8.12 | 1.30 | 7.39 | 1.12 | 7.32 | 1.01 | 7.46 | 1.15 | 7.45 | 1.08 | 7.21 | 0.97 | 7.17 | 1.14 |
| | E-net | 7.35 | 0.84 | 7.50 | 1.00 | 7.22 | 0.89 | 8.13 | 1.29 | 7.37 | 1.11 | 7.31 | 0.99 | 7.46 | 1.17 | 7.43 | 1.07 | 7.17 | 0.96 | 7.15 | 1.12 |
| | SCAD | 6.44 | 0.72 | 6.61 | 0.76 | 6.51 | 0.74 | 7.33 | 1.09 | 6.47 | 0.87 | 6.47 | 0.76 | 6.64 | 0.86 | 6.49 | 0.85 | 6.40 | 0.76 | 6.40 | 0.87 |
| | MCP | 6.44 | 0.72 | 6.62 | 0.77 | 6.51 | 0.74 | 7.33 | 1.08 | 6.47 | 0.85 | 6.48 | 0.79 | 6.62 | 0.87 | 6.51 | 0.88 | 6.40 | 0.77 | 6.41 | 0.86 |
| | XGBoost | 0.36 | 0.12 | 0.38 | 0.10 | 0.36 | 0.15 | 0.14 | 0.20 | 0.39 | 0.10 | 0.39 | 0.09 | 0.30 | 0.20 | 0.38 | 0.12 | 0.39 | 0.11 | 0.40 | 0.13 |
| | RF | 0.70 | 0.08 | 0.70 | 0.08 | 0.58 | 0.07 | 0.36 | 0.05 | 0.71 | 0.08 | 0.67 | 0.07 | 0.47 | 0.06 | 0.71 | 0.08 | 0.65 | 0.08 | 0.52 | 0.06 |
| | SVM | 1.65 | 0.71 | 1.49 | 0.59 | 1.67 | 0.58 | 1.97 | 0.36 | 1.47 | 0.59 | 1.55 | 0.69 | 2.02 | 0.42 | 1.60 | 0.55 | 1.58 | 0.53 | 1.95 | 0.35 |
| 3 | OLS | 154.90 | 29.43 | 153.57 | 38.17 | 163.70 | 36.41 | 160.50 | 38.41 | 165.55 | 41.95 | 163.30 | 37.35 | 161.13 | 37.67 | 160.40 | 37.48 | 154.51 | 33.28 | 163.32 | 39.35 |
| | AIC B | 157.39 | 29.98 | 156.16 | 39.17 | 166.24 | 36.98 | 163.32 | 39.04 | 168.47 | 43.01 | 165.86 | 38.00 | 163.76 | 38.36 | 162.92 | 38.28 | 157.06 | 34.20 | 165.84 | 39.81 |
| | BIC B | 161.94 | 31.79 | 160.18 | 39.97 | 170.54 | 38.29 | 166.71 | 39.83 | 173.71 | 44.44 | 170.61 | 39.77 | 167.45 | 38.86 | 167.90 | 39.75 | 161.08 | 34.69 | 169.06 | 41.12 |
| | AIC SB | 157.39 | 29.98 | 156.16 | 39.17 | 166.24 | 36.98 | 163.32 | 39.04 | 168.47 | 43.01 | 165.84 | 38.00 | 163.74 | 38.35 | 162.92 | 38.28 | 157.06 | 34.20 | 165.84 | 39.81 |
| | BIC SB | 161.94 | 31.79 | 160.18 | 39.97 | 170.54 | 38.29 | 166.71 | 39.83 | 173.71 | 44.44 | 170.54 | 39.68 | 167.33 | 38.72 | 167.86 | 39.80 | 161.08 | 34.69 | 169.06 | 41.12 |
| | AIC F | 157.50 | 29.94 | 156.28 | 39.28 | 166.61 | 37.03 | 163.85 | 39.37 | 168.70 | 43.02 | 166.58 | 38.32 | 165.18 | 38.51 | 162.96 | 38.24 | 157.47 | 34.20 | 166.48 | 39.89 |
| | BIC F | 162.21 | 31.97 | 160.18 | 39.97 | 170.93 | 38.16 | 167.19 | 39.83 | 174.00 | 44.66 | 170.87 | 39.53 | 167.78 | 38.73 | 168.10 | 39.91 | 161.34 | 34.88 | 169.40 | 41.32 |
| | AIC SF | 157.50 | 29.94 | 156.28 | 39.28 | 166.61 | 37.03 | 163.85 | 39.37 | 168.70 | 43.02 | 166.59 | 38.30 | 165.35 | 38.54 | 162.98 | 38.26 | 157.47 | 34.20 | 166.48 | 39.89 |
| | BIC SF | 162.21 | 31.97 | 160.18 | 39.97 | 170.93 | 38.16 | 167.19 | 39.83 | 174.00 | 44.66 | 170.90 | 39.55 | 167.84 | 38.81 | 168.10 | 39.91 | 161.34 | 34.88 | 169.45 | 41.32 |
| | Ridge | 202.77 | 46.62 | 202.21 | 58.64 | 216.45 | 57.97 | 207.53 | 56.20 | 222.76 | 71.59 | 215.96 | 58.54 | 212.98 | 57.10 | 212.96 | 59.95 | 201.79 | 50.27 | 217.28 | 63.89 |
| | Lasso | 199.78 | 42.76 | 199.21 | 55.75 | 210.26 | 54.10 | 199.86 | 53.41 | 220.57 | 68.39 | 212.77 | 54.49 | 205.36 | 54.46 | 210.30 | 54.81 | 198.52 | 48.98 | 212.73 | 64.01 |
| | E-net | 200.40 | 42.61 | 199.66 | 56.25 | 210.12 | 54.72 | 199.43 | 53.79 | 220.80 | 68.36 | 212.83 | 54.45 | 205.34 | 54.57 | 210.89 | 55.38 | 199.13 | 48.99 | 212.90 | 64.13 |
| | SCAD | 162.29 | 31.87 | 160.39 | 41.90 | 171.16 | 38.97 | 166.40 | 39.36 | 173.79 | 45.34 | 171.44 | 39.37 | 166.98 | 39.14 | 168.28 | 39.87 | 161.18 | 34.86 | 168.88 | 41.98 |
| | MCP | 162.40 | 32.06 | 160.84 | 42.42 | 171.23 | 38.73 | 166.11 | 39.41 | 174.06 | 45.64 | 171.57 | 39.37 | 167.15 | 39.23 | 168.24 | 40.60 | 161.28 | 34.96 | 169.23 | 41.92 |
| | XGBoost | 2.99 | 0.83 | 3.13 | 0.89 | 3.34 | 0.81 | 1.65 | 1.71 | 3.01 | 0.82 | 3.10 | 0.94 | 3.12 | 1.30 | 3.08 | 0.79 | 3.04 | 0.86 | 3.18 | 1.13 |
| | RF | 11.52 | 2.77 | 10.92 | 2.51 | 10.55 | 3.11 | 6.15 | 2.66 | 12.72 | 4.56 | 11.98 | 3.31 | 7.96 | 2.53 | 11.82 | 3.39 | 10.99 | 3.10 | 9.82 | 2.64 |
| | SVM | 10.87 | 5.48 | 10.18 | 4.97 | 13.02 | 10.19 | 14.25 | 13.26 | 14.54 | 13.38 | 12.56 | 7.79 | 13.70 | 8.74 | 11.70 | 6.67 | 11.57 | 5.96 | 14.27 | 5.87 |
| 6 | OLS | 2314.26 | 468.48 | 2295.58 | 599.97 | 2447.43 | 574.49 | 2369.54 | 611.07 | 2495.68 | 666.82 | 2452.08 | 594.11 | 2414.61 | 601.25 | 2418.21 | 591.93 | 2318.47 | 530.74 | 2474.30 | 616.49 |
| | AIC B | 2356.52 | 475.66 | 2337.63 | 612.63 | 2488.15 | 584.03 | 2413.01 | 623.12 | 2547.33 | 683.64 | 2497.03 | 604.05 | 2454.05 | 609.71 | 2463.47 | 604.90 | 2361.68 | 545.17 | 2513.98 | 627.64 |
| | BIC B | 2413.76 | 493.67 | 2393.08 | 625.02 | 2549.08 | 591.97 | 2458.09 | 626.63 | 2609.52 | 701.23 | 2558.66 | 617.59 | 2508.61 | 617.22 | 2524.09 | 615.35 | 2411.66 | 563.39 | 2562.51 | 645.36 |
| | AIC SB | 2356.52 | 475.66 | 2337.63 | 612.63 | 2488.15 | 584.03 | 2413.01 | 623.12 | 2546.76 | 683.47 | 2497.03 | 604.05 | 2454.05 | 609.71 | 2463.47 | 604.90 | 2361.68 | 545.17 | 2513.98 | 627.64 |
| | BIC SB | 2413.76 | 493.67 | 2393.08 | 625.02 | 2549.08 | 591.97 | 2458.09 | 626.63 | 2609.52 | 701.23 | 2558.15 | 618.16 | 2508.61 | 617.22 | 2524.09 | 615.35 | 2411.66 | 563.39 | 2562.51 | 645.36 |
| | AIC F | 2357.92 | 476.79 | 2339.22 | 612.80 | 2493.90 | 582.91 | 2422.56 | 624.65 | 2549.35 | 682.70 | 2503.46 | 600.41 | 2475.68 | 617.91 | 2467.21 | 605.20 | 2367.67 | 545.16 | 2528.58 | 626.87 |
| | BIC F | 2413.76 | 493.67 | 2396.27 | 628.23 | 2557.38 | 597.35 | 2469.35 | 632.08 | 2610.98 | 700.64 | 2562.40 | 618.59 | 2517.49 | 620.86 | 2528.74 | 619.50 | 2414.12 | 563.66 | 2568.91 | 645.60 |
| | AIC SF | 2357.92 | 476.79 | 2339.22 | 612.80 | 2494.09 | 582.73 | 2422.56 | 624.65 | 2549.35 | 682.70 | 2503.96 | 600.60 | 2476.62 | 617.68 | 2467.47 | 605.34 | 2367.67 | 545.16 | 2529.03 | 626.85 |
| | BIC SF | 2413.76 | 493.67 | 2396.27 | 628.23 | 2557.38 | 597.35 | 2469.35 | 632.08 | 2610.98 | 700.64 | 2562.40 | 618.59 | 2517.49 | 620.86 | 2528.74 | 619.50 | 2414.12 | 563.66 | 2568.91 | 645.60 |
| | Ridge | 2795.38 | 529.90 | 2830.29 | 692.81 | 3038.70 | 732.88 | 2944.29 | 821.55 | 3048.87 | 792.26 | 2999.89 | 684.73 | 3008.49 | 790.88 | 2942.85 | 689.35 | 2825.52 | 615.43 | 3011.06 | 719.21 |
| | Lasso | 2781.75 | 536.48 | 2809.82 | 698.72 | 3015.88 | 740.48 | 2906.39 | 826.43 | 3041.13 | 799.12 | 2984.55 | 691.05 | 2982.37 | 792.29 | 2932.77 | 692.88 | 2812.83 | 622.33 | 2998.01 | 726.67 |
| | E-net | 2782.18 | 535.88 | 2812.96 | 695.93 | 3017.04 | 740.42 | 2907.02 | 828.26 | 3042.75 | 797.79 | 2987.36 | 689.70 | 2984.66 | 795.46 | 2933.15 | 693.30 | 2813.09 | 621.58 | 2998.94 | 726.76 |
| | SCAD | 2419.19 | 499.14 | 2397.78 | 642.99 | 2544.84 | 593.10 | 2443.93 | 638.28 | 2621.34 | 727.07 | 2567.06 | 631.85 | 2504.91 | 611.26 | 2523.62 | 631.76 | 2410.49 | 558.04 | 2584.04 | 672.98 |
| | MCP | 2427.87 | 500.60 | 2407.76 | 648.48 | 2541.56 | 589.67 | 2445.19 | 635.17 | 2625.14 | 714.69 | 2574.18 | 635.95 | 2500.87 | 630.79 | 2526.16 | 627.93 | 2410.43 | 549.34 | 2572.92 | 659.62 |
| | XGBoost | 14.53 | 2.55 | 14.55 | 3.57 | 13.52 | 5.12 | 5.76 | 6.73 | 14.40 | 2.94 | 14.58 | 4.46 | 9.64 | 7.58 | 13.83 | 3.98 | 13.67 | 4.27 | 12.63 | 6.67 |
| | RF | 113.23 | 40.26 | 106.95 | 40.68 | 109.74 | 46.66 | 63.43 | 36.86 | 134.04 | 73.98 | 116.40 | 51.55 | 75.81 | 41.72 | 119.36 | 54.66 | 104.15 | 46.20 | 85.10 | 34.22 |
| | SVM | 166.87 | 83.36 | 155.33 | 84.93 | 187.93 | 150.34 | 138.28 | 170.54 | 235.16 | 236.04 | 187.50 | 127.94 | 149.88 | 127.30 | 182.09 | 112.71 | 163.80 | 96.49 | 163.61 | 104.10 |

Table 41: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 200$ and $p = 100$. See Figure 41 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 3.30 | 0.52 | 3.31 | 0.51 | 3.41 | 0.52 | 3.79 | 0.70 | 3.37 | 0.58 | 3.34 | 0.51 | 3.30 | 0.58 | 3.28 | 0.55 | 3.36 | 0.54 | 3.83 | 0.70 |
| | AIC F | 4.31 | 0.74 | 4.37 | 0.71 | 4.50 | 0.74 | 5.06 | 0.94 | 4.46 | 0.86 | 4.54 | 0.72 | 5.21 | 0.99 | 4.37 | 0.83 | 4.55 | 0.84 | 6.03 | 1.17 |
| | BIC F | 5.98 | 0.89 | 6.13 | 0.84 | 6.38 | 0.84 | 7.08 | 1.18 | 6.08 | 0.95 | 6.11 | 0.79 | 6.41 | 1.06 | 6.02 | 0.92 | 6.41 | 0.93 | 7.31 | 1.04 |
| | AIC SF | 4.31 | 0.73 | 4.36 | 0.71 | 4.51 | 0.75 | 5.07 | 0.95 | 4.45 | 0.85 | 4.56 | 0.74 | 5.24 | 1.01 | 4.40 | 0.81 | 4.57 | 0.83 | 6.03 | 1.17 |
| | BIC SF | 5.99 | 0.89 | 6.13 | 0.84 | 6.39 | 0.83 | 7.08 | 1.18 | 6.09 | 0.95 | 6.11 | 0.79 | 6.41 | 1.06 | 6.01 | 0.92 | 6.41 | 0.93 | 7.31 | 1.04 |
| | Ridge | 6.83 | 2.00 | 7.19 | 1.70 | 7.93 | 1.96 | 9.42 | 1.69 | 6.96 | 1.95 | 6.65 | 1.50 | 7.40 | 1.53 | 6.92 | 1.71 | 7.52 | 1.77 | 9.16 | 1.47 |
| | Lasso | 7.80 | 1.25 | 7.67 | 1.14 | 7.50 | 1.13 | 8.12 | 1.52 | 7.82 | 1.33 | 7.52 | 1.01 | 7.37 | 1.41 | 7.53 | 1.26 | 7.58 | 1.23 | 8.35 | 1.31 |
| | E-net | 7.85 | 1.25 | 7.63 | 1.13 | 7.43 | 1.13 | 8.05 | 1.51 | 7.83 | 1.33 | 7.53 | 1.06 | 7.38 | 1.38 | 7.53 | 1.27 | 7.54 | 1.22 | 8.33 | 1.31 |
| | SCAD | 6.51 | 1.05 | 6.60 | 0.88 | 6.88 | 0.92 | 7.47 | 1.16 | 6.62 | 1.03 | 6.54 | 0.88 | 6.64 | 1.08 | 6.42 | 1.04 | 6.79 | 1.00 | 7.51 | 1.01 |
| | MCP | 6.66 | 1.05 | 6.68 | 0.90 | 7.01 | 0.89 | 7.45 | 1.13 | 6.72 | 1.05 | 6.62 | 0.92 | 6.63 | 1.15 | 6.54 | 0.98 | 6.86 | 1.01 | 7.54 | 0.98 |
| | XGBoost | 0.04 | 0.03 | 0.06 | 0.02 | 0.07 | 0.02 | 0.04 | 0.06 | 0.05 | 0.02 | 0.05 | 0.02 | 0.07 | 0.04 | 0.05 | 0.02 | 0.06 | 0.02 | 0.04 | 0.06 |
| | RF | 0.89 | 0.12 | 0.87 | 0.10 | 0.72 | 0.10 | 0.41 | 0.06 | 0.87 | 0.11 | 0.81 | 0.09 | 0.52 | 0.07 | 0.85 | 0.11 | 0.69 | 0.09 | 0.39 | 0.08 |
| | SVM | 0.37 | 0.15 | 0.36 | 0.10 | 0.44 | 0.20 | 1.62 | 0.63 | 0.35 | 0.14 | 0.34 | 0.12 | 0.51 | 0.29 | 0.37 | 0.16 | 0.39 | 0.11 | 0.95 | 0.34 |
| 3 | OLS | 86.73 | 26.20 | 84.90 | 20.84 | 83.01 | 21.46 | 84.12 | 22.67 | 82.49 | 22.31 | 81.85 | 19.99 | 83.01 | 21.62 | 86.54 | 24.61 | 91.36 | 29.74 | 86.60 | 19.50 |
| | AIC F | 115.33 | 35.65 | 113.92 | 28.96 | 110.83 | 27.70 | 112.24 | 30.08 | 108.96 | 30.13 | 113.81 | 29.45 | 133.91 | 36.88 | 116.01 | 33.42 | 124.61 | 41.79 | 137.13 | 35.50 |
| | BIC F | 160.09 | 47.64 | 157.88 | 39.86 | 156.09 | 37.74 | 158.33 | 38.29 | 150.91 | 37.50 | 152.68 | 36.16 | 159.79 | 41.76 | 157.77 | 38.09 | 168.37 | 50.16 | 168.01 | 36.15 |
| | AIC SF | 116.02 | 35.92 | 114.35 | 29.41 | 111.17 | 28.37 | 112.35 | 29.79 | 108.93 | 29.65 | 113.90 | 29.10 | 135.18 | 37.55 | 115.98 | 33.50 | 124.35 | 40.77 | 137.64 | 35.25 |
| | BIC SF | 160.28 | 47.80 | 157.92 | 39.84 | 156.21 | 37.86 | 158.46 | 38.22 | 150.95 | 37.50 | 152.74 | 36.09 | 160.07 | 41.69 | 157.70 | 38.14 | 168.31 | 50.20 | 168.01 | 36.15 |
| | Ridge | 236.39 | 71.11 | 245.92 | 63.77 | 234.33 | 61.97 | 212.63 | 55.06 | 233.19 | 61.55 | 228.80 | 67.01 | 210.68 | 62.71 | 240.48 | 70.19 | 243.75 | 75.28 | 220.75 | 56.96 |
| | Lasso | 219.31 | 67.40 | 215.23 | 57.57 | 207.41 | 58.68 | 198.75 | 51.87 | 212.52 | 59.28 | 208.33 | 53.31 | 203.37 | 58.90 | 217.55 | 61.69 | 225.77 | 78.23 | 211.06 | 52.44 |
| | E-net | 220.15 | 67.50 | 216.12 | 58.13 | 207.38 | 59.35 | 198.94 | 52.58 | 213.54 | 59.07 | 209.80 | 54.23 | 203.40 | 59.21 | 218.11 | 61.96 | 225.06 | 78.15 | 211.70 | 53.73 |
| | SCAD | 173.42 | 50.70 | 168.15 | 41.57 | 166.11 | 40.57 | 166.21 | 37.82 | 165.26 | 39.74 | 165.23 | 37.76 | 167.18 | 43.19 | 169.70 | 41.11 | 178.67 | 52.22 | 173.28 | 36.13 |
| | MCP | 177.09 | 53.88 | 170.15 | 42.07 | 167.56 | 42.45 | 166.07 | 37.64 | 167.40 | 39.93 | 166.84 | 38.09 | 167.22 | 43.58 | 172.20 | 41.83 | 182.04 | 54.34 | 172.09 | 36.03 |
| | XGBoost | 0.45 | 0.18 | 0.54 | 0.11 | 0.69 | 0.17 | 0.39 | 0.62 | 0.47 | 0.16 | 0.48 | 0.19 | 0.85 | 0.35 | 0.50 | 0.13 | 0.63 | 0.15 | 0.39 | 0.58 |
| | RF | 15.03 | 5.48 | 15.17 | 3.25 | 13.32 | 3.75 | 7.09 | 2.46 | 15.25 | 4.45 | 14.81 | 3.32 | 9.53 | 2.55 | 15.02 | 3.76 | 13.23 | 4.14 | 7.36 | 2.33 |
| | SVM | 33.49 | 26.15 | 29.85 | 16.61 | 21.61 | 11.96 | 15.95 | 14.67 | 32.69 | 26.60 | 28.43 | 14.72 | 22.38 | 10.56 | 30.55 | 18.87 | 24.34 | 15.74 | 18.40 | 11.19 |
| 6 | OLS | 1309.35 | 412.05 | 1272.10 | 330.10 | 1233.17 | 333.58 | 1245.39 | 349.64 | 1235.73 | 346.56 | 1227.95 | 310.63 | 1238.80 | 331.56 | 1297.99 | 386.30 | 1371.65 | 463.01 | 1297.12 | 297.04 |
| | AIC F | 1732.34 | 541.70 | 1707.72 | 443.80 | 1632.99 | 436.63 | 1668.76 | 487.43 | 1643.89 | 473.39 | 1705.41 | 439.93 | 1999.44 | 562.14 | 1744.56 | 531.00 | 1886.50 | 645.46 | 2089.12 | 593.32 |
| | BIC F | 2412.24 | 745.64 | 2369.30 | 634.70 | 2328.02 | 615.15 | 2373.31 | 586.13 | 2249.38 | 588.93 | 2264.92 | 552.99 | 2409.90 | 628.39 | 2361.03 | 609.52 | 2534.27 | 789.51 | 2509.28 | 565.34 |
| | AIC SF | 1737.23 | 546.68 | 1711.97 | 449.70 | 1643.46 | 432.86 | 1680.03 | 491.51 | 1654.68 | 476.72 | 1708.71 | 442.06 | 2008.43 | 567.89 | 1748.87 | 527.23 | 1889.65 | 634.76 | 2092.51 | 589.70 |
| | BIC SF | 2412.24 | 745.64 | 2369.72 | 634.51 | 2329.64 | 615.50 | 2373.31 | 586.13 | 2249.84 | 588.82 | 2265.18 | 552.45 | 2410.30 | 628.40 | 2361.03 | 609.52 | 2536.43 | 789.14 | 2509.70 | 565.36 |
| | Ridge | 2992.81 | 829.57 | 2965.28 | 702.92 | 2972.56 | 757.58 | 2960.44 | 782.34 | 2855.95 | 669.08 | 2924.72 | 644.41 | 2969.20 | 697.69 | 2981.67 | 695.96 | 3160.01 | 828.49 | 3116.24 | 679.62 |
| | Lasso | 2979.96 | 841.58 | 2944.74 | 719.25 | 2933.14 | 759.83 | 2923.73 | 804.11 | 2845.14 | 676.62 | 2885.72 | 666.30 | 2920.53 | 715.09 | 2952.42 | 708.49 | 3113.22 | 846.71 | 3087.33 | 686.86 |
| | E-net | 2980.39 | 841.29 | 2946.41 | 717.84 | 2935.67 | 760.02 | 2924.21 | 803.33 | 2846.94 | 675.98 | 2887.85 | 665.11 | 2923.93 | 715.39 | 2953.58 | 708.32 | 3116.96 | 844.96 | 3087.37 | 687.16 |
| | SCAD | 2613.85 | 837.23 | 2507.91 | 684.56 | 2439.95 | 647.34 | 2466.27 | 636.49 | 2457.79 | 647.90 | 2431.99 | 617.62 | 2462.43 | 682.97 | 2521.98 | 679.32 | 2661.53 | 849.35 | 2560.90 | 584.57 |
| | MCP | 2645.05 | 842.08 | 2542.40 | 671.18 | 2456.82 | 643.36 | 2453.59 | 630.22 | 2481.84 | 652.06 | 2451.67 | 601.19 | 2475.79 | 673.71 | 2558.63 | 675.62 | 2688.06 | 845.56 | 2543.39 | 580.44 |
| | XGBoost | 2.37 | 0.61 | 2.60 | 0.59 | 3.02 | 1.08 | 1.88 | 2.83 | 2.39 | 0.72 | 2.55 | 0.63 | 3.18 | 2.15 | 2.44 | 0.66 | 2.72 | 1.11 | 1.96 | 2.54 |
| | RF | 147.33 | 86.00 | 139.10 | 46.21 | 127.63 | 53.28 | 71.03 | 34.38 | 144.19 | 71.77 | 135.56 | 46.92 | 92.36 | 40.23 | 139.82 | 53.89 | 136.29 | 66.41 | 79.41 | 34.99 |
| | SVM | 1180.89 | 792.82 | 742.22 | 428.49 | 431.48 | 195.47 | 219.48 | 176.56 | 1037.12 | 648.67 | 829.78 | 489.98 | 460.41 | 188.54 | 899.62 | 569.28 | 491.59 | 271.92 | 286.05 | 158.89 |

Table 42: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 200$ and $p = 2000$. See Figure 42 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 20.99 | 2.78 | 17.45 | 2.57 | 14.36 | 1.83 | 9.68 | 1.25 | 22.46 | 2.93 | 22.16 | 5.30 | 13.17 | 2.72 | 12.71 | 3.12 | 9.86 | 1.83 | 8.69 | 1.40 |
| | Lasso | 8.59 | 1.05 | 7.72 | 1.21 | 7.34 | 1.15 | 7.59 | 1.21 | 8.59 | 1.25 | 7.91 | 0.99 | 7.47 | 1.29 | 8.25 | 1.11 | 7.78 | 1.54 | 8.38 | 1.37 |
| | E-net | 8.74 | 1.10 | 7.61 | 1.21 | 7.18 | 1.12 | 7.55 | 1.23 | 8.71 | 1.31 | 7.97 | 1.02 | 7.51 | 1.29 | 8.30 | 1.12 | 7.75 | 1.55 | 8.35 | 1.37 |
| | SCAD | 6.67 | 0.97 | 6.26 | 0.99 | 6.54 | 0.99 | 7.68 | 1.14 | 6.56 | 1.23 | 6.41 | 1.10 | 6.36 | 1.09 | 6.67 | 1.03 | 6.77 | 1.21 | 7.60 | 1.23 |
| | MCP | 6.87 | 0.94 | 6.58 | 0.91 | 6.99 | 0.96 | 7.58 | 1.03 | 6.94 | 0.96 | 6.63 | 0.89 | 6.54 | 1.05 | 6.93 | 1.03 | 6.95 | 1.14 | 7.61 | 1.17 |
| | XGBoost | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | RF | 1.03 | 0.14 | 0.98 | 0.12 | 0.89 | 0.11 | 0.46 | 0.06 | 1.10 | 0.14 | 1.01 | 0.11 | 0.61 | 0.09 | 1.02 | 0.13 | 0.81 | 0.10 | 0.43 | 0.06 |
| | SVM | 1.69 | 2.41 | 0.60 | 0.70 | 0.64 | 0.57 | 1.18 | 0.43 | 1.30 | 2.12 | 0.87 | 0.82 | 0.68 | 0.24 | 0.48 | 0.19 | 0.42 | 0.10 | 0.48 | 0.05 |
| 3 | Ridge | 258.67 | 52.42 | 261.26 | 50.94 | 234.91 | 58.62 | 185.75 | 54.76 | 281.02 | 59.92 | 277.01 | 50.50 | 284.41 | 74.63 | 268.60 | 60.62 | 259.90 | 80.72 | 224.45 | 67.52 |
| | Lasso | 220.00 | 61.01 | 216.57 | 52.79 | 219.55 | 61.90 | 192.92 | 60.28 | 243.81 | 73.25 | 216.54 | 57.09 | 211.56 | 55.74 | 215.14 | 60.45 | 227.72 | 69.18 | 216.21 | 59.33 |
| | E-net | 221.74 | 61.14 | 217.85 | 53.29 | 218.95 | 62.61 | 193.17 | 60.64 | 245.10 | 73.16 | 218.25 | 57.22 | 212.35 | 56.73 | 217.01 | 60.91 | 228.97 | 70.19 | 216.18 | 59.19 |
| | SCAD | 160.67 | 43.24 | 158.90 | 38.32 | 164.20 | 34.01 | 159.68 | 42.17 | 174.48 | 57.67 | 157.63 | 45.00 | 166.60 | 40.75 | 155.79 | 40.25 | 171.82 | 45.54 | 174.38 | 40.08 |
| | MCP | 171.33 | 47.21 | 167.14 | 38.30 | 171.04 | 35.84 | 159.43 | 42.68 | 187.55 | 54.87 | 165.88 | 44.17 | 169.69 | 40.35 | 166.70 | 44.05 | 181.22 | 46.60 | 173.60 | 41.11 |
| | XGBoost | 0.01 | 0.00 | 0.01 | 0.00 | 0.03 | 0.01 | 0.04 | 0.12 | 0.01 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.00 | 0.02 | 0.01 | 0.02 | 0.06 |
| | RF | 18.73 | 4.28 | 19.54 | 4.08 | 17.70 | 4.40 | 8.12 | 2.11 | 21.00 | 6.45 | 19.42 | 4.07 | 12.35 | 2.90 | 19.02 | 5.04 | 17.15 | 5.20 | 8.65 | 3.11 |
| | SVM | 58.68 | 50.36 | 41.22 | 35.01 | 28.87 | 18.88 | 21.10 | 14.15 | 67.91 | 61.57 | 42.47 | 37.83 | 34.87 | 18.02 | 33.32 | 24.74 | 31.99 | 21.42 | 23.37 | 14.07 |
| 6 | Ridge | 2897.93 | 772.37 | 2956.94 | 631.21 | 3044.57 | 766.15 | 2737.62 | 786.21 | 3171.84 | 826.06 | 2944.17 | 680.38 | 3091.20 | 643.14 | 2936.40 | 731.56 | 3202.54 | 851.92 | 3094.17 | 779.02 |
| | Lasso | 2883.77 | 786.18 | 2926.92 | 658.65 | 3050.54 | 765.53 | 2821.98 | 760.06 | 3158.84 | 837.16 | 2911.66 | 691.71 | 2984.14 | 666.15 | 2918.63 | 740.54 | 3170.64 | 857.34 | 3066.11 | 781.94 |
| | E-net | 2884.99 | 785.09 | 2929.49 | 656.32 | 3047.41 | 762.15 | 2822.39 | 761.10 | 3160.18 | 835.80 | 2915.59 | 691.05 | 2986.69 | 666.55 | 2919.35 | 739.05 | 3173.89 | 856.45 | 3066.63 | 782.34 |
| | SCAD | 2471.21 | 816.83 | 2419.49 | 691.43 | 2467.24 | 603.58 | 2350.18 | 676.79 | 2720.37 | 970.25 | 2356.06 | 807.42 | 2510.67 | 669.44 | 2370.08 | 760.55 | 2524.58 | 791.94 | 2532.85 | 655.73 |
| | MCP | 2533.60 | 757.81 | 2492.18 | 657.12 | 2556.17 | 622.16 | 2338.43 | 687.36 | 2798.28 | 866.06 | 2467.98 | 734.03 | 2538.14 | 683.26 | 2476.70 | 718.68 | 2637.46 | 789.03 | 2545.54 | 673.83 |
| | XGBoost | 0.03 | 0.02 | 0.06 | 0.03 | 0.12 | 0.09 | 0.32 | 0.65 | 0.04 | 0.02 | 0.04 | 0.02 | 0.07 | 0.06 | 0.05 | 0.02 | 0.07 | 0.05 | 0.09 | 0.24 |
| | RF | 169.87 | 59.79 | 173.49 | 58.94 | 157.20 | 60.60 | 82.86 | 34.69 | 198.72 | 88.97 | 176.20 | 57.35 | 117.29 | 39.53 | 169.99 | 71.42 | 167.18 | 74.37 | 94.83 | 46.39 |
| | SVM | 1058.14 | 683.48 | 850.64 | 596.04 | 509.02 | 251.03 | 264.07 | 154.47 | 1324.14 | 997.37 | 1093.20 | 751.74 | 1148.18 | 755.53 | 1046.25 | 659.42 | 778.30 | 567.76 | 475.15 | 224.21 |

Table 43: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 1000$ and $p = 10$. See Figure 43 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 6.65 | 0.32 | 6.70 | 0.30 | 6.89 | 0.38 | 7.59 | 0.44 | 6.65 | 0.36 | 6.57 | 0.34 | 6.75 | 0.48 | 6.60 | 0.36 | 6.58 | 0.38 | 6.63 | 0.38 |
| | AIC B | 6.67 | 0.32 | 6.71 | 0.30 | 6.90 | 0.38 | 7.61 | 0.44 | 6.67 | 0.36 | 6.58 | 0.35 | 6.76 | 0.48 | 6.61 | 0.36 | 6.59 | 0.38 | 6.65 | 0.38 |
| | BIC B | 6.69 | 0.32 | 6.74 | 0.30 | 6.93 | 0.38 | 7.65 | 0.44 | 6.69 | 0.36 | 6.61 | 0.35 | 6.80 | 0.48 | 6.63 | 0.36 | 6.62 | 0.39 | 6.69 | 0.38 |
| | AIC SB | 6.67 | 0.32 | 6.71 | 0.30 | 6.90 | 0.38 | 7.61 | 0.44 | 6.67 | 0.36 | 6.58 | 0.35 | 6.76 | 0.48 | 6.61 | 0.36 | 6.59 | 0.38 | 6.65 | 0.38 |
| | BIC SB | 6.69 | 0.32 | 6.74 | 0.30 | 6.93 | 0.38 | 7.65 | 0.44 | 6.69 | 0.36 | 6.61 | 0.35 | 6.80 | 0.48 | 6.63 | 0.36 | 6.62 | 0.39 | 6.69 | 0.38 |
| | AIC F | 6.67 | 0.32 | 6.71 | 0.30 | 6.90 | 0.38 | 7.61 | 0.44 | 6.67 | 0.36 | 6.58 | 0.35 | 6.77 | 0.48 | 6.61 | 0.36 | 6.60 | 0.38 | 6.65 | 0.38 |
| | BIC F | 6.69 | 0.32 | 6.74 | 0.30 | 6.93 | 0.38 | 7.65 | 0.44 | 6.69 | 0.36 | 6.61 | 0.34 | 6.81 | 0.48 | 6.63 | 0.36 | 6.62 | 0.39 | 6.69 | 0.38 |
| | AIC SF | 6.67 | 0.32 | 6.71 | 0.30 | 6.90 | 0.38 | 7.61 | 0.44 | 6.67 | 0.36 | 6.58 | 0.35 | 6.77 | 0.48 | 6.61 | 0.36 | 6.60 | 0.38 | 6.65 | 0.38 |
| | BIC SF | 6.69 | 0.32 | 6.74 | 0.30 | 6.93 | 0.38 | 7.65 | 0.44 | 6.69 | 0.36 | 6.61 | 0.35 | 6.81 | 0.48 | 6.63 | 0.36 | 6.62 | 0.39 | 6.69 | 0.38 |
| | Ridge | 7.03 | 0.39 | 7.07 | 0.33 | 7.33 | 0.44 | 8.33 | 0.53 | 7.04 | 0.44 | 6.98 | 0.41 | 7.36 | 0.54 | 6.99 | 0.41 | 6.99 | 0.45 | 7.25 | 0.50 |
| | Lasso | 7.04 | 0.39 | 7.05 | 0.33 | 7.25 | 0.44 | 8.05 | 0.52 | 7.04 | 0.44 | 6.93 | 0.41 | 7.16 | 0.53 | 6.98 | 0.41 | 6.94 | 0.45 | 7.05 | 0.49 |
| | E-net | 7.04 | 0.40 | 7.05 | 0.33 | 7.25 | 0.44 | 8.03 | 0.52 | 7.04 | 0.44 | 6.93 | 0.41 | 7.15 | 0.53 | 6.98 | 0.41 | 6.93 | 0.45 | 7.04 | 0.48 |
| | SCAD | 6.67 | 0.32 | 6.72 | 0.30 | 6.91 | 0.38 | 7.63 | 0.45 | 6.67 | 0.36 | 6.59 | 0.35 | 6.77 | 0.48 | 6.62 | 0.36 | 6.60 | 0.39 | 6.66 | 0.39 |
| | MCP | 6.67 | 0.32 | 6.72 | 0.30 | 6.91 | 0.38 | 7.63 | 0.45 | 6.68 | 0.36 | 6.59 | 0.35 | 6.77 | 0.48 | 6.62 | 0.36 | 6.60 | 0.39 | 6.66 | 0.39 |
| | XGBoost | 0.60 | 0.44 | 0.59 | 0.44 | 0.56 | 0.44 | 0.05 | 0.15 | 0.68 | 0.41 | 0.68 | 0.39 | 0.62 | 0.38 | 0.49 | 0.45 | 0.53 | 0.44 | 0.78 | 0.25 |
| | RF | 0.40 | 0.02 | 0.40 | 0.02 | 0.34 | 0.02 | 0.24 | 0.01 | 0.41 | 0.03 | 0.37 | 0.02 | 0.28 | 0.02 | 0.40 | 0.02 | 0.37 | 0.02 | 0.30 | 0.02 |
| | SVM | 1.90 | 0.35 | 1.93 | 0.34 | 2.02 | 0.27 | 2.11 | 0.14 | 1.92 | 0.31 | 2.00 | 0.28 | 2.24 | 0.13 | 1.94 | 0.31 | 2.04 | 0.27 | 2.18 | 0.13 |
| 3 | OLS | 172.72 | 17.53 | 173.36 | 22.37 | 176.24 | 16.97 | 177.45 | 18.24 | 172.85 | 20.81 | 171.38 | 18.49 | 175.25 | 20.84 | 172.15 | 20.80 | 171.37 | 20.88 | 170.51 | 18.58 |
| | AIC B | 173.23 | 17.57 | 173.81 | 22.42 | 176.74 | 17.02 | 178.06 | 18.32 | 173.34 | 20.89 | 171.82 | 18.52 | 175.78 | 20.90 | 172.66 | 20.86 | 171.85 | 20.92 | 171.00 | 18.60 |
| | BIC B | 174.33 | 17.71 | 174.93 | 22.61 | 177.87 | 17.22 | 179.02 | 18.31 | 174.65 | 21.00 | 172.90 | 18.73 | 176.83 | 21.01 | 173.67 | 21.06 | 172.95 | 21.01 | 171.95 | 18.67 |
| | AIC SB | 173.23 | 17.57 | 173.81 | 22.42 | 176.74 | 17.02 | 178.06 | 18.32 | 173.34 | 20.89 | 171.82 | 18.52 | 175.78 | 20.90 | 172.66 | 20.86 | 171.85 | 20.92 | 171.00 | 18.60 |
| | BIC SB | 174.33 | 17.71 | 174.93 | 22.61 | 177.87 | 17.22 | 179.02 | 18.31 | 174.65 | 21.00 | 172.87 | 18.71 | 176.83 | 21.01 | 173.67 | 21.06 | 172.95 | 21.01 | 171.95 | 18.67 |
| | AIC F | 173.23 | 17.57 | 173.84 | 22.43 | 176.76 | 17.03 | 178.14 | 18.35 | 173.35 | 20.89 | 171.88 | 18.53 | 175.99 | 20.94 | 172.66 | 20.85 | 171.87 | 20.90 | 171.12 | 18.64 |
| | BIC F | 174.33 | 17.71 | 174.93 | 22.61 | 177.92 | 17.21 | 179.05 | 18.33 | 174.65 | 21.00 | 172.92 | 18.72 | 176.85 | 20.99 | 173.70 | 21.08 | 173.01 | 21.03 | 171.97 | 18.65 |
| | AIC SF | 173.23 | 17.57 | 173.84 | 22.43 | 176.76 | 17.03 | 178.14 | 18.35 | 173.35 | 20.89 | 171.88 | 18.53 | 176.00 | 20.94 | 172.67 | 20.86 | 171.87 | 20.90 | 171.12 | 18.64 |
| | BIC SF | 174.33 | 17.71 | 174.93 | 22.61 | 177.92 | 17.21 | 179.05 | 18.33 | 174.65 | 21.00 | 172.92 | 18.72 | 176.85 | 20.99 | 173.70 | 21.08 | 173.01 | 21.03 | 171.97 | 18.65 |
| | Ridge | 191.77 | 21.86 | 193.35 | 28.38 | 196.58 | 20.41 | 198.62 | 22.26 | 192.24 | 26.55 | 191.25 | 23.18 | 195.76 | 25.24 | 192.23 | 26.69 | 191.67 | 27.17 | 190.39 | 23.43 |
| | Lasso | 192.92 | 21.58 | 193.63 | 28.26 | 195.37 | 20.09 | 195.62 | 22.02 | 193.27 | 26.27 | 191.51 | 23.06 | 193.37 | 25.25 | 192.81 | 26.10 | 191.13 | 26.68 | 188.30 | 23.49 |
| | E-net | 192.95 | 21.60 | 193.65 | 28.26 | 195.37 | 20.35 | 195.31 | 22.27 | 193.24 | 26.49 | 191.32 | 23.18 | 193.10 | 25.02 | 193.00 | 26.33 | 191.15 | 26.74 | 188.00 | 23.68 |
| | SCAD | 173.90 | 17.73 | 174.39 | 22.53 | 177.27 | 17.00 | 178.62 | 18.27 | 173.76 | 21.00 | 172.41 | 18.58 | 176.51 | 20.90 | 173.35 | 20.96 | 172.45 | 21.02 | 171.55 | 18.84 |
| | MCP | 173.99 | 17.76 | 174.55 | 22.66 | 177.21 | 17.03 | 178.55 | 18.28 | 173.80 | 20.88 | 172.49 | 18.60 | 176.56 | 20.91 | 173.33 | 20.99 | 172.45 | 21.03 | 171.54 | 18.77 |
| | XGBoost | 7.17 | 0.38 | 7.21 | 0.35 | 7.20 | 0.78 | 4.57 | 3.43 | 7.21 | 0.37 | 7.15 | 0.77 | 7.12 | 1.26 | 7.20 | 0.34 | 7.20 | 0.33 | 7.21 | 0.76 |
| | RF | 5.59 | 0.91 | 5.37 | 0.88 | 4.65 | 0.64 | 3.17 | 0.58 | 5.53 | 0.94 | 5.39 | 0.85 | 3.83 | 0.78 | 5.60 | 1.02 | 5.16 | 0.90 | 4.15 | 0.54 |
| | SVM | 11.05 | 2.70 | 10.40 | 2.60 | 10.39 | 2.34 | 12.00 | 4.00 | 10.69 | 2.88 | 10.39 | 2.45 | 12.24 | 4.69 | 10.86 | 2.85 | 10.30 | 2.74 | 11.52 | 2.33 |
| 6 | OLS | 2599.03 | 279.57 | 2604.76 | 354.27 | 2639.54 | 264.18 | 2646.01 | 278.43 | 2600.65 | 327.25 | 2585.46 | 294.91 | 2637.03 | 332.73 | 2592.98 | 329.31 | 2580.37 | 333.81 | 2569.83 | 288.75 |
| | AIC B | 2607.71 | 280.16 | 2614.22 | 355.52 | 2648.47 | 265.41 | 2655.37 | 279.76 | 2609.59 | 328.57 | 2594.10 | 295.58 | 2645.77 | 334.14 | 2602.01 | 330.57 | 2588.92 | 334.77 | 2578.21 | 289.28 |
| | BIC B | 2627.22 | 284.50 | 2631.19 | 358.98 | 2665.70 | 266.20 | 2669.75 | 280.79 | 2630.36 | 331.72 | 2612.16 | 297.16 | 2659.97 | 336.50 | 2621.06 | 332.75 | 2604.95 | 336.31 | 2589.61 | 290.71 |
| | AIC SB | 2607.71 | 280.16 | 2614.22 | 355.52 | 2648.47 | 265.41 | 2655.37 | 279.76 | 2609.59 | 328.57 | 2594.10 | 295.58 | 2645.77 | 334.14 | 2602.01 | 330.57 | 2588.92 | 334.77 | 2578.21 | 289.28 |
| | BIC SB | 2627.22 | 284.50 | 2631.19 | 358.98 | 2665.70 | 266.20 | 2669.75 | 280.79 | 2630.36 | 331.72 | 2612.16 | 297.16 | 2659.97 | 336.50 | 2621.06 | 332.75 | 2604.95 | 336.31 | 2589.61 | 290.71 |
| | AIC F | 2607.82 | 280.27 | 2614.72 | 356.13 | 2649.94 | 266.07 | 2657.80 | 280.68 | 2610.04 | 329.03 | 2595.50 | 295.85 | 2649.72 | 333.83 | 2602.34 | 330.56 | 2589.92 | 334.98 | 2580.08 | 290.02 |
| | BIC F | 2627.49 | 283.86 | 2631.19 | 358.98 | 2666.01 | 265.94 | 2669.75 | 280.79 | 2631.15 | 332.26 | 2612.39 | 296.99 | 2660.21 | 335.28 | 2621.06 | 332.75 | 2606.21 | 337.87 | 2589.59 | 290.70 |
| | AIC SF | 2607.82 | 280.27 | 2614.72 | 356.13 | 2649.94 | 266.07 | 2657.80 | 280.68 | 2610.04 | 329.03 | 2595.54 | 295.78 | 2649.72 | 333.83 | 2602.34 | 330.56 | 2589.92 | 334.98 | 2580.08 | 290.02 |
| | BIC SF | 2627.49 | 283.86 | 2631.19 | 358.98 | 2666.01 | 265.94 | 2669.75 | 280.79 | 2631.15 | 332.26 | 2612.39 | 296.99 | 2660.50 | 335.73 | 2621.06 | 332.75 | 2606.21 | 337.87 | 2589.59 | 290.70 |
| | Ridge | 2899.43 | 312.70 | 2915.72 | 402.81 | 2972.46 | 309.91 | 2968.64 | 344.62 | 2912.15 | 388.88 | 2912.24 | 349.42 | 2964.82 | 413.08 | 2895.37 | 376.78 | 2887.22 | 369.96 | 2867.19 | 334.43 |
| | Lasso | 2886.41 | 315.83 | 2897.49 | 408.74 | 2941.61 | 305.34 | 2929.17 | 338.39 | 2898.28 | 387.07 | 2886.85 | 353.35 | 2931.39 | 407.10 | 2880.23 | 377.65 | 2868.14 | 370.32 | 2846.76 | 334.82 |
| | E-net | 2887.20 | 316.33 | 2898.70 | 405.56 | 2944.09 | 306.19 | 2931.58 | 340.02 | 2897.57 | 387.10 | 2887.49 | 352.88 | 2930.81 | 406.50 | 2883.78 | 376.36 | 2866.35 | 372.39 | 2846.56 | 335.22 |
| | SCAD | 2628.46 | 283.62 | 2632.14 | 358.37 | 2666.44 | 265.28 | 2664.73 | 279.03 | 2627.41 | 331.42 | 2613.04 | 299.09 | 2658.99 | 335.14 | 2620.65 | 332.45 | 2606.37 | 338.18 | 2588.24 | 290.71 |
| | MCP | 2629.17 | 285.59 | 2633.22 | 359.10 | 2667.47 | 264.06 | 2663.62 | 279.01 | 2629.89 | 332.85 | 2614.33 | 299.90 | 2657.52 | 335.40 | 2621.69 | 332.28 | 2608.46 | 337.80 | 2588.79 | 290.22 |
| | XGBoost | 30.04 | 1.65 | 29.85 | 3.42 | 29.76 | 4.42 | 14.46 | 14.41 | 30.29 | 1.77 | 29.83 | 4.49 | 25.83 | 10.97 | 29.71 | 4.31 | 29.98 | 3.27 | 28.38 | 8.33 |
| | RF | 49.00 | 14.70 | 45.43 | 13.96 | 40.77 | 10.15 | 25.59 | 8.32 | 46.80 | 14.93 | 44.87 | 12.64 | 29.41 | 10.97 | 48.88 | 17.02 | 43.02 | 16.03 | 29.48 | 7.38 |
| | SVM | 130.74 | 45.70 | 117.36 | 47.48 | 98.42 | 34.39 | 84.09 | 53.36 | 126.31 | 53.03 | 108.66 | 41.92 | 94.99 | 67.69 | 126.15 | 50.92 | 102.07 | 48.48 | 86.44 | 41.25 |

Table 44: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 1000$ and $p = 100$. See Figure 44 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 6.07 | 0.34 | 6.02 | 0.29 | 6.25 | 0.36 | 6.88 | 0.46 | 6.03 | 0.32 | 5.97 | 0.32 | 6.11 | 0.43 | 6.04 | 0.34 | 6.22 | 0.34 | 6.97 | 0.45 |
| | AIC F | 6.34 | 0.36 | 6.28 | 0.30 | 6.52 | 0.38 | 7.18 | 0.47 | 6.30 | 0.34 | 6.27 | 0.34 | 6.55 | 0.46 | 6.31 | 0.37 | 6.52 | 0.37 | 7.49 | 0.50 |
| | BIC F | 6.65 | 0.36 | 6.60 | 0.30 | 6.88 | 0.38 | 7.58 | 0.48 | 6.63 | 0.35 | 6.58 | 0.36 | 6.75 | 0.47 | 6.64 | 0.38 | 6.86 | 0.39 | 7.73 | 0.49 |
| | AIC SF | 6.34 | 0.36 | 6.28 | 0.30 | 6.52 | 0.38 | 7.18 | 0.47 | 6.30 | 0.34 | 6.27 | 0.35 | 6.55 | 0.46 | 6.31 | 0.37 | 6.52 | 0.37 | 7.49 | 0.50 |
| | BIC SF | 6.65 | 0.36 | 6.60 | 0.30 | 6.88 | 0.38 | 7.58 | 0.48 | 6.63 | 0.35 | 6.58 | 0.36 | 6.75 | 0.47 | 6.64 | 0.38 | 6.86 | 0.39 | 7.73 | 0.49 |
| | Ridge | 6.61 | 0.41 | 6.61 | 0.40 | 6.98 | 0.52 | 8.40 | 0.70 | 6.56 | 0.38 | 6.56 | 0.40 | 7.18 | 0.60 | 6.63 | 0.42 | 6.97 | 0.48 | 8.46 | 0.64 |
| | Lasso | 7.13 | 0.43 | 7.03 | 0.38 | 7.24 | 0.48 | 7.95 | 0.56 | 7.07 | 0.40 | 6.98 | 0.38 | 7.13 | 0.56 | 7.07 | 0.44 | 7.24 | 0.47 | 8.12 | 0.57 |
| | E-net | 7.14 | 0.43 | 7.03 | 0.39 | 7.23 | 0.48 | 7.90 | 0.55 | 7.08 | 0.40 | 6.98 | 0.39 | 7.14 | 0.56 | 7.08 | 0.44 | 7.24 | 0.47 | 8.10 | 0.56 |
| | SCAD | 6.64 | 0.38 | 6.58 | 0.31 | 6.87 | 0.39 | 7.65 | 0.49 | 6.60 | 0.36 | 6.57 | 0.36 | 6.78 | 0.47 | 6.63 | 0.39 | 6.83 | 0.38 | 7.77 | 0.50 |
| | MCP | 6.67 | 0.38 | 6.60 | 0.31 | 6.89 | 0.39 | 7.65 | 0.49 | 6.64 | 0.36 | 6.59 | 0.37 | 6.79 | 0.47 | 6.65 | 0.39 | 6.85 | 0.39 | 7.76 | 0.51 |
| | XGBoost | 0.57 | 0.23 | 0.59 | 0.21 | 0.54 | 0.28 | 0.02 | 0.13 | 0.58 | 0.23 | 0.54 | 0.24 | 0.42 | 0.32 | 0.51 | 0.27 | 0.46 | 0.30 | 0.02 | 0.12 |
| | RF | 0.48 | 0.03 | 0.49 | 0.02 | 0.41 | 0.02 | 0.25 | 0.01 | 0.48 | 0.03 | 0.43 | 0.02 | 0.29 | 0.02 | 0.48 | 0.02 | 0.38 | 0.02 | 0.25 | 0.01 |
| | SVM | 0.32 | 0.05 | 0.33 | 0.04 | 0.47 | 0.06 | 1.75 | 0.16 | 0.31 | 0.05 | 0.31 | 0.04 | 0.60 | 0.05 | 0.32 | 0.04 | 0.40 | 0.04 | 1.25 | 0.24 |
| 3 | OLS | 158.31 | 17.82 | 155.69 | 18.25 | 161.40 | 18.60 | 160.80 | 16.72 | 155.51 | 17.24 | 155.76 | 18.64 | 157.00 | 17.98 | 156.41 | 18.50 | 156.79 | 17.74 | 158.50 | 16.62 |
| | AIC F | 165.19 | 18.65 | 162.74 | 19.10 | 168.73 | 19.46 | 168.38 | 17.49 | 162.45 | 18.12 | 163.56 | 19.56 | 167.96 | 19.34 | 163.45 | 19.36 | 164.67 | 18.68 | 170.22 | 17.97 |
| | BIC F | 174.52 | 19.76 | 171.41 | 19.43 | 177.99 | 19.91 | 177.50 | 18.52 | 171.19 | 19.00 | 171.84 | 20.57 | 173.79 | 19.88 | 172.66 | 20.32 | 173.35 | 19.49 | 175.41 | 18.00 |
| | AIC SF | 165.21 | 18.66 | 162.78 | 19.10 | 168.74 | 19.47 | 168.38 | 17.49 | 162.47 | 18.12 | 163.61 | 19.58 | 168.05 | 19.37 | 163.48 | 19.36 | 164.74 | 18.69 | 170.24 | 17.98 |
| | BIC SF | 174.52 | 19.76 | 171.41 | 19.43 | 178.00 | 19.90 | 177.50 | 18.52 | 171.19 | 19.00 | 171.84 | 20.57 | 173.79 | 19.88 | 172.66 | 20.32 | 173.35 | 19.49 | 175.41 | 18.00 |
| | Ridge | 194.20 | 26.13 | 192.95 | 29.05 | 206.23 | 28.25 | 202.09 | 24.44 | 190.80 | 26.24 | 191.40 | 26.77 | 196.86 | 26.02 | 193.55 | 26.57 | 198.22 | 26.92 | 198.40 | 21.96 |
| | Lasso | 195.92 | 24.46 | 191.32 | 24.59 | 198.40 | 24.14 | 194.86 | 24.18 | 192.12 | 22.78 | 191.41 | 24.67 | 192.13 | 25.03 | 192.91 | 24.56 | 192.16 | 24.09 | 191.98 | 21.34 |
| | E-net | 196.19 | 24.72 | 191.27 | 24.82 | 198.14 | 24.16 | 194.25 | 24.06 | 192.41 | 23.00 | 191.36 | 24.51 | 192.22 | 24.81 | 192.82 | 24.61 | 191.74 | 23.89 | 191.87 | 21.52 |
| | SCAD | 174.90 | 20.36 | 171.31 | 19.50 | 178.56 | 19.75 | 178.86 | 18.95 | 171.50 | 18.95 | 172.26 | 20.93 | 174.22 | 20.30 | 172.90 | 20.36 | 173.39 | 19.46 | 176.21 | 18.27 |
| | MCP | 175.80 | 20.58 | 171.89 | 19.34 | 178.81 | 19.77 | 178.79 | 18.90 | 172.11 | 19.09 | 172.98 | 21.06 | 174.31 | 20.19 | 173.51 | 20.49 | 173.74 | 19.60 | 176.23 | 18.25 |
| | XGBoost | 5.24 | 0.27 | 5.25 | 0.31 | 5.57 | 0.31 | 2.42 | 3.11 | 5.22 | 0.30 | 5.24 | 0.26 | 5.69 | 0.88 | 5.22 | 0.28 | 5.37 | 0.29 | 4.05 | 2.93 |
| | RF | 6.35 | 1.06 | 6.27 | 0.86 | 5.67 | 0.84 | 3.49 | 0.65 | 6.57 | 0.92 | 6.36 | 0.83 | 4.34 | 0.82 | 6.17 | 0.77 | 5.40 | 0.63 | 3.29 | 0.46 |
| | SVM | 33.85 | 8.06 | 25.58 | 6.46 | 17.36 | 5.39 | 13.30 | 4.11 | 32.33 | 6.87 | 28.08 | 6.73 | 15.05 | 4.45 | 28.02 | 6.57 | 18.54 | 4.00 | 12.57 | 3.07 |
| 6 | OLS | 2382.09 | 284.68 | 2343.04 | 291.46 | 2417.00 | 289.31 | 2398.79 | 260.81 | 2344.14 | 274.45 | 2346.38 | 293.99 | 2356.64 | 280.73 | 2356.05 | 295.57 | 2346.93 | 281.60 | 2357.14 | 260.56 |
| | AIC F | 2486.89 | 297.30 | 2449.65 | 305.34 | 2528.02 | 302.27 | 2513.08 | 273.64 | 2452.01 | 287.23 | 2466.42 | 308.80 | 2525.85 | 301.55 | 2465.56 | 309.86 | 2465.20 | 295.81 | 2532.95 | 280.13 |
| | BIC F | 2636.85 | 320.98 | 2582.64 | 311.17 | 2668.93 | 311.25 | 2647.17 | 290.28 | 2586.37 | 301.85 | 2590.68 | 322.24 | 2607.93 | 310.81 | 2600.60 | 325.59 | 2596.01 | 308.50 | 2608.88 | 283.64 |
| | AIC SF | 2487.34 | 297.29 | 2449.82 | 305.43 | 2528.61 | 302.30 | 2513.58 | 273.89 | 2452.28 | 287.24 | 2467.44 | 309.51 | 2526.62 | 301.61 | 2465.89 | 309.49 | 2465.99 | 296.19 | 2532.88 | 279.93 |
| | BIC SF | 2636.85 | 320.98 | 2582.64 | 311.17 | 2668.93 | 311.25 | 2647.17 | 290.28 | 2586.37 | 301.85 | 2590.68 | 322.24 | 2608.06 | 310.74 | 2600.60 | 325.59 | 2596.01 | 308.50 | 2609.04 | 283.56 |
| | Ridge | 2979.31 | 337.87 | 2945.00 | 360.06 | 3061.52 | 353.78 | 2966.06 | 372.53 | 2939.33 | 331.07 | 2949.98 | 368.38 | 2962.95 | 370.22 | 2967.97 | 360.83 | 2962.16 | 364.27 | 2928.56 | 331.23 |
| | Lasso | 2918.87 | 359.86 | 2861.78 | 369.05 | 2980.66 | 369.46 | 2929.00 | 380.56 | 2873.90 | 341.75 | 2868.95 | 367.11 | 2898.73 | 366.56 | 2895.61 | 374.60 | 2886.40 | 373.36 | 2880.54 | 332.40 |
| | E-net | 2919.85 | 359.79 | 2862.70 | 370.14 | 2984.08 | 369.24 | 2930.19 | 381.92 | 2877.00 | 340.94 | 2871.28 | 368.06 | 2900.93 | 367.03 | 2896.88 | 373.28 | 2886.46 | 374.20 | 2880.55 | 333.14 |
| | SCAD | 2653.37 | 322.42 | 2596.87 | 310.09 | 2684.43 | 305.38 | 2656.50 | 290.03 | 2602.34 | 298.41 | 2605.05 | 324.72 | 2617.94 | 313.59 | 2617.75 | 332.26 | 2606.16 | 313.14 | 2609.93 | 285.85 |
| | MCP | 2657.83 | 325.29 | 2602.47 | 312.83 | 2686.59 | 310.22 | 2653.29 | 290.87 | 2605.40 | 300.10 | 2609.89 | 327.96 | 2621.48 | 315.34 | 2622.02 | 332.58 | 2609.33 | 314.88 | 2609.53 | 285.07 |
| | XGBoost | 22.35 | 1.27 | 22.55 | 1.38 | 23.45 | 2.73 | 9.23 | 12.39 | 22.30 | 1.39 | 22.15 | 3.39 | 23.17 | 6.01 | 22.41 | 1.29 | 22.24 | 4.13 | 13.51 | 12.53 |
| | RF | 52.54 | 16.67 | 51.39 | 14.05 | 48.84 | 13.19 | 29.47 | 9.47 | 54.73 | 13.39 | 52.05 | 11.21 | 35.61 | 13.36 | 50.39 | 11.70 | 46.95 | 10.01 | 27.37 | 6.82 |
| | SVM | 665.59 | 159.86 | 509.08 | 109.35 | 332.71 | 87.91 | 151.71 | 57.50 | 641.56 | 113.67 | 563.78 | 112.13 | 284.46 | 73.68 | 565.39 | 110.03 | 376.11 | 70.43 | 177.86 | 44.16 |

Table 45: Mean and standard deviation of the training MSE for the non-linear simulations when $n = 1000$ and $p = 2000$. See Figure 45 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 15.21 | 1.38 | 14.84 | 1.35 | 13.64 | 0.95 | 9.61 | 0.68 | 15.39 | 1.37 | 15.49 | 1.09 | 15.90 | 0.66 | 13.84 | 0.90 | 12.36 | 0.67 | 9.33 | 0.61 |
| | Lasso | 7.30 | 0.44 | 7.13 | 0.47 | 7.24 | 0.45 | 7.99 | 0.63 | 7.15 | 0.41 | 7.15 | 0.39 | 7.17 | 0.47 | 7.24 | 0.37 | 7.34 | 0.52 | 8.00 | 0.65 |
| | E-net | 7.32 | 0.45 | 7.11 | 0.47 | 7.19 | 0.44 | 7.91 | 0.62 | 7.17 | 0.41 | 7.16 | 0.39 | 7.18 | 0.47 | 7.25 | 0.37 | 7.33 | 0.51 | 7.96 | 0.64 |
| | SCAD | 6.64 | 0.42 | 6.58 | 0.41 | 6.96 | 0.36 | 7.84 | 0.49 | 6.51 | 0.42 | 6.58 | 0.40 | 6.95 | 0.42 | 6.64 | 0.37 | 6.99 | 0.42 | 7.75 | 0.50 |
| | MCP | 6.68 | 0.38 | 6.61 | 0.42 | 6.95 | 0.36 | 7.84 | 0.49 | 6.57 | 0.37 | 6.64 | 0.37 | 6.93 | 0.42 | 6.69 | 0.35 | 6.94 | 0.44 | 7.75 | 0.50 |
| | XGBoost | 0.32 | 0.04 | 0.32 | 0.04 | 0.33 | 0.12 | 0.03 | 0.11 | 0.29 | 0.08 | 0.29 | 0.07 | 0.18 | 0.16 | 0.30 | 0.06 | 0.26 | 0.13 | 0.00 | 0.04 |
| | RF | 0.58 | 0.03 | 0.60 | 0.04 | 0.49 | 0.03 | 0.29 | 0.02 | 0.57 | 0.03 | 0.50 | 0.03 | 0.32 | 0.02 | 0.57 | 0.03 | 0.45 | 0.02 | 0.26 | 0.02 |
| | SVM | 0.52 | 0.08 | 0.43 | 0.07 | 0.44 | 0.09 | 1.25 | 0.28 | 0.52 | 0.08 | 0.49 | 0.08 | 0.43 | 0.06 | 0.41 | 0.07 | 0.40 | 0.04 | 0.85 | 0.44 |
| 3 | Ridge | 256.27 | 26.81 | 255.39 | 24.31 | 232.43 | 20.07 | 196.77 | 19.80 | 259.38 | 29.29 | 256.87 | 36.49 | 214.54 | 26.86 | 240.45 | 30.01 | 225.87 | 29.13 | 199.38 | 23.11 |
| | Lasso | 193.89 | 23.79 | 199.84 | 21.74 | 199.47 | 22.62 | 193.90 | 24.32 | 193.03 | 24.79 | 196.87 | 24.29 | 193.19 | 24.27 | 194.88 | 23.19 | 198.08 | 25.12 | 192.99 | 22.86 |
| | E-net | 194.32 | 23.77 | 200.05 | 21.71 | 198.79 | 22.78 | 192.99 | 24.16 | 193.46 | 24.78 | 197.15 | 24.27 | 193.16 | 24.13 | 195.19 | 23.12 | 198.03 | 25.21 | 192.64 | 22.95 |
| | SCAD | 172.59 | 20.62 | 174.31 | 17.66 | 176.53 | 17.97 | 178.09 | 19.40 | 170.53 | 20.21 | 173.56 | 19.32 | 173.90 | 20.98 | 172.40 | 19.23 | 175.75 | 21.18 | 175.72 | 17.75 |
| | MCP | 173.19 | 20.54 | 175.92 | 17.20 | 178.17 | 18.31 | 177.89 | 19.46 | 171.94 | 19.76 | 173.88 | 18.53 | 174.39 | 20.63 | 173.60 | 19.14 | 177.41 | 20.94 | 175.58 | 17.95 |
| | XGBoost | 2.66 | 0.14 | 2.73 | 0.16 | 3.22 | 0.15 | 1.88 | 2.42 | 2.62 | 0.14 | 2.60 | 0.14 | 3.08 | 0.19 | 2.64 | 0.15 | 2.92 | 0.16 | 1.63 | 2.10 |
| | RF | 7.56 | 0.94 | 7.88 | 0.90 | 7.05 | 0.90 | 3.92 | 0.55 | 7.75 | 0.86 | 7.67 | 1.05 | 5.01 | 0.82 | 7.54 | 0.92 | 6.63 | 0.85 | 3.70 | 0.49 |
| | SVM | 30.17 | 8.39 | 29.49 | 6.36 | 23.24 | 5.66 | 15.72 | 5.37 | 30.84 | 7.65 | 29.91 | 7.57 | 31.31 | 8.71 | 29.60 | 7.56 | 27.30 | 6.90 | 12.67 | 2.83 |
| 6 | Ridge | 2935.88 | 323.58 | 3066.65 | 289.79 | 3013.85 | 351.78 | 2764.47 | 376.25 | 2961.98 | 323.42 | 3022.21 | 297.11 | 3090.26 | 391.00 | 2999.08 | 300.74 | 3071.03 | 347.70 | 2937.92 | 355.21 |
| | Lasso | 2861.26 | 340.19 | 2962.98 | 317.39 | 2996.57 | 347.61 | 2916.51 | 363.82 | 2858.56 | 368.18 | 2915.35 | 339.43 | 2903.83 | 383.50 | 2890.96 | 333.06 | 2953.93 | 364.67 | 2894.24 | 357.52 |
| | E-net | 2863.13 | 339.40 | 2966.12 | 317.74 | 2997.39 | 347.46 | 2918.20 | 364.22 | 2862.29 | 367.47 | 2918.39 | 338.17 | 2904.86 | 383.51 | 2893.62 | 332.66 | 2958.00 | 364.46 | 2895.11 | 357.97 |
| | SCAD | 2588.04 | 317.11 | 2639.78 | 271.75 | 2664.60 | 285.36 | 2620.83 | 295.03 | 2564.30 | 298.11 | 2603.00 | 292.56 | 2604.09 | 323.76 | 2592.94 | 292.85 | 2648.28 | 312.32 | 2589.11 | 282.02 |
| | MCP | 2599.50 | 318.02 | 2660.02 | 278.07 | 2682.95 | 291.80 | 2618.70 | 294.69 | 2585.33 | 304.47 | 2616.86 | 283.45 | 2612.86 | 319.47 | 2607.53 | 294.68 | 2659.98 | 316.19 | 2589.99 | 280.63 |
| | XGBoost | 11.80 | 0.67 | 12.26 | 0.79 | 13.89 | 2.13 | 8.19 | 10.10 | 11.77 | 0.62 | 11.70 | 0.62 | 13.27 | 2.84 | 11.92 | 0.71 | 12.87 | 1.99 | 5.98 | 8.58 |
| | RF | 60.05 | 14.99 | 63.35 | 13.11 | 60.51 | 13.10 | 33.24 | 7.59 | 61.20 | 12.00 | 60.77 | 14.99 | 41.73 | 13.07 | 59.66 | 12.76 | 58.15 | 13.25 | 32.09 | 7.32 |
| | SVM | 1226.72 | 627.93 | 729.20 | 317.42 | 464.41 | 100.51 | 222.26 | 56.97 | 1188.96 | 569.02 | 1057.58 | 495.47 | 775.02 | 354.52 | 1037.15 | 509.60 | 546.82 | 113.04 | 248.47 | 47.24 |

## 5.2 Tables for the testing MSE of the non-linear simulations

Table 46: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 50$ and $p = 10$. See Figure 46 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 8.77 | 2.11 | 9.07 | 2.34 | 9.17 | 2.32 | 10.50 | 3.08 | 8.68 | 2.13 | 8.97 | 2.11 | 9.23 | 2.26 | 9.05 | 2.66 | 8.59 | 2.73 | 8.88 | 2.96 |
| | AIC B | 8.63 | 2.16 | 8.72 | 2.26 | 8.85 | 2.25 | 9.99 | 3.16 | 8.59 | 2.00 | 8.69 | 2.18 | 8.85 | 2.19 | 8.91 | 2.61 | 8.41 | 2.66 | 8.77 | 3.02 |
| | BIC B | 8.41 | 2.14 | 8.48 | 2.22 | 8.72 | 2.08 | 9.77 | 2.93 | 8.44 | 1.91 | 8.53 | 2.01 | 8.57 | 2.21 | 8.57 | 2.41 | 8.16 | 2.45 | 8.71 | 3.00 |
| | AIC SB | 8.63 | 2.16 | 8.72 | 2.26 | 8.85 | 2.25 | 9.99 | 3.16 | 8.59 | 2.00 | 8.69 | 2.18 | 8.88 | 2.19 | 8.91 | 2.61 | 8.41 | 2.66 | 8.77 | 3.03 |
| | BIC SB | 8.41 | 2.14 | 8.48 | 2.22 | 8.73 | 2.08 | 9.77 | 2.93 | 8.44 | 1.91 | 8.53 | 2.01 | 8.57 | 2.21 | 8.56 | 2.41 | 8.16 | 2.45 | 8.71 | 3.00 |
| | AIC F | 8.57 | 2.01 | 8.61 | 2.22 | 8.78 | 2.19 | 9.87 | 3.03 | 8.56 | 2.01 | 8.50 | 2.19 | 8.65 | 2.23 | 8.85 | 2.57 | 8.24 | 2.44 | 8.68 | 3.09 |
| | BIC F | 8.34 | 2.03 | 8.38 | 2.18 | 8.69 | 2.09 | 9.78 | 2.87 | 8.39 | 1.91 | 8.43 | 2.06 | 8.36 | 2.16 | 8.56 | 2.35 | 8.04 | 2.41 | 8.63 | 3.11 |
| | AIC SF | 8.58 | 2.02 | 8.61 | 2.22 | 8.78 | 2.19 | 9.89 | 3.15 | 8.57 | 2.01 | 8.50 | 2.20 | 8.65 | 2.20 | 8.85 | 2.57 | 8.24 | 2.44 | 8.68 | 3.12 |
| | BIC SF | 8.34 | 2.03 | 8.38 | 2.18 | 8.69 | 2.09 | 9.77 | 2.85 | 8.39 | 1.91 | 8.41 | 2.06 | 8.36 | 2.16 | 8.56 | 2.35 | 8.04 | 2.41 | 8.69 | 3.16 |
| | Ridge | 10.40 | 3.17 | 10.62 | 3.52 | 10.34 | 2.76 | 11.23 | 3.75 | 10.38 | 3.38 | 10.54 | 3.41 | 9.94 | 3.23 | 10.68 | 3.47 | 10.33 | 3.39 | 9.77 | 3.53 |
| | Lasso | 9.28 | 2.55 | 9.56 | 2.96 | 9.63 | 2.69 | 10.90 | 3.39 | 9.57 | 2.59 | 9.56 | 2.59 | 9.45 | 2.58 | 9.49 | 2.90 | 9.23 | 2.85 | 9.62 | 3.54 |
| | E-net | 9.33 | 2.58 | 9.62 | 2.99 | 9.65 | 2.69 | 10.89 | 3.33 | 9.63 | 2.67 | 9.60 | 2.61 | 9.46 | 2.65 | 9.56 | 2.98 | 9.30 | 2.92 | 9.64 | 3.55 |
| | SCAD | 8.13 | 2.08 | 8.15 | 2.25 | 8.64 | 2.29 | 10.01 | 2.89 | 8.17 | 1.79 | 8.28 | 1.99 | 8.41 | 2.14 | 8.48 | 2.35 | 7.87 | 2.41 | 8.79 | 3.36 |
| | MCP | 8.18 | 2.12 | 8.21 | 2.29 | 8.64 | 2.16 | 10.02 | 2.88 | 8.29 | 1.81 | 8.38 | 2.08 | 8.67 | 2.33 | 8.51 | 2.35 | 7.93 | 2.43 | 8.60 | 3.12 |
| | XGBoost | 4.98 | 1.90 | 5.09 | 1.72 | 4.77 | 1.61 | 4.27 | 1.74 | 5.10 | 1.66 | 4.77 | 1.53 | 4.75 | 1.60 | 5.24 | 1.71 | 5.36 | 2.11 | 4.57 | 1.52 |
| | RF | 7.72 | 2.44 | 7.53 | 2.60 | 6.25 | 1.97 | 4.16 | 1.89 | 7.95 | 2.37 | 8.10 | 2.48 | 5.65 | 1.74 | 8.26 | 2.67 | 7.98 | 2.74 | 6.50 | 1.66 |
| | SVM | 10.30 | 2.56 | 10.73 | 3.00 | 10.06 | 3.74 | 7.06 | 4.60 | 10.55 | 2.94 | 10.69 | 2.89 | 8.42 | 3.56 | 10.53 | 2.88 | 10.05 | 3.26 | 7.64 | 2.88 |
| 3 | OLS | 227.12 | 91.36 | 246.45 | 131.00 | 254.50 | 116.11 | 263.25 | 124.25 | 234.93 | 103.87 | 242.48 | 113.08 | 254.80 | 134.20 | 236.95 | 127.17 | 236.54 | 107.72 | 229.57 | 143.83 |
| | AIC B | 219.56 | 87.95 | 239.87 | 128.20 | 244.90 | 116.80 | 254.06 | 126.54 | 226.48 | 102.96 | 234.66 | 113.91 | 245.63 | 130.81 | 227.11 | 124.11 | 223.90 | 105.20 | 218.46 | 139.84 |
| | BIC B | 208.66 | 88.38 | 229.43 | 126.32 | 234.77 | 109.74 | 245.44 | 123.81 | 218.33 | 100.93 | 226.51 | 116.28 | 238.15 | 128.52 | 217.58 | 121.53 | 219.57 | 102.17 | 211.62 | 136.33 |
| | AIC SB | 219.46 | 88.01 | 239.87 | 128.20 | 244.90 | 116.80 | 253.99 | 126.60 | 226.49 | 102.95 | 235.08 | 114.10 | 245.57 | 130.79 | 227.12 | 124.12 | 224.20 | 105.46 | 219.58 | 142.51 |
| | BIC SB | 208.66 | 88.38 | 229.43 | 126.32 | 234.72 | 109.79 | 245.50 | 123.82 | 218.54 | 101.02 | 226.33 | 116.24 | 237.34 | 128.49 | 216.89 | 121.86 | 219.57 | 102.17 | 211.62 | 136.33 |
| | AIC F | 217.01 | 87.28 | 236.19 | 128.24 | 240.08 | 114.50 | 248.34 | 121.91 | 225.09 | 103.13 | 231.43 | 112.68 | 238.13 | 126.71 | 221.23 | 121.50 | 219.38 | 101.49 | 211.56 | 136.84 |
| | BIC F | 207.16 | 88.60 | 226.96 | 123.79 | 229.62 | 108.81 | 241.47 | 124.63 | 217.90 | 102.35 | 222.37 | 111.19 | 233.24 | 123.24 | 216.38 | 122.48 | 216.11 | 105.02 | 207.64 | 133.44 |
| | AIC SF | 217.01 | 87.28 | 236.19 | 128.24 | 240.74 | 115.43 | 248.23 | 121.92 | 225.16 | 103.06 | 232.05 | 114.12 | 239.37 | 128.12 | 221.35 | 121.43 | 219.46 | 101.61 | 211.75 | 136.73 |
| | BIC SF | 207.16 | 88.60 | 226.96 | 123.79 | 229.43 | 108.87 | 241.92 | 125.01 | 217.90 | 102.35 | 222.37 | 111.19 | 232.90 | 122.30 | 216.38 | 122.48 | 216.17 | 105.06 | 207.47 | 133.17 |
| | Ridge | 245.43 | 97.85 | 263.87 | 96.53 | 267.83 | 109.80 | 268.99 | 126.97 | 261.83 | 99.45 | 272.21 | 109.03 | 271.32 | 131.05 | 252.87 | 115.49 | 253.48 | 104.03 | 253.56 | 143.72 |
| | Lasso | 233.09 | 98.14 | 254.55 | 98.78 | 257.59 | 107.75 | 265.26 | 125.43 | 249.84 | 100.77 | 260.54 | 108.73 | 268.59 | 131.10 | 244.57 | 119.74 | 245.45 | 104.33 | 245.98 | 147.18 |
| | E-net | 233.79 | 97.92 | 255.01 | 98.72 | 258.97 | 108.30 | 263.87 | 125.10 | 250.86 | 100.42 | 261.23 | 108.73 | 268.62 | 130.77 | 245.16 | 118.43 | 245.80 | 104.02 | 246.44 | 146.49 |
| | SCAD | 205.17 | 86.88 | 226.24 | 127.85 | 232.61 | 115.92 | 249.62 | 129.18 | 215.47 | 101.50 | 222.27 | 111.04 | 241.80 | 130.76 | 214.79 | 124.36 | 213.61 | 101.64 | 215.18 | 134.38 |
| | MCP | 205.29 | 87.41 | 227.73 | 128.54 | 234.30 | 115.18 | 251.13 | 130.71 | 216.29 | 102.71 | 224.40 | 113.52 | 245.58 | 132.53 | 213.23 | 125.25 | 215.38 | 103.28 | 213.92 | 133.03 |
| | XGBoost | 70.20 | 49.63 | 73.03 | 38.31 | 83.31 | 71.68 | 71.12 | 44.41 | 73.20 | 51.60 | 76.55 | 62.10 | 82.02 | 56.11 | 73.38 | 54.67 | 78.24 | 55.20 | 79.24 | 104.03 |
| | RF | 132.20 | 70.67 | 135.02 | 62.39 | 129.19 | 80.46 | 78.00 | 56.47 | 137.83 | 74.39 | 139.50 | 85.73 | 101.60 | 65.12 | 137.14 | 84.48 | 133.67 | 72.70 | 111.36 | 112.94 |
| | SVM | 156.19 | 70.03 | 157.92 | 69.55 | 135.78 | 97.70 | 88.04 | 92.92 | 163.78 | 77.87 | 147.20 | 75.53 | 97.56 | 78.99 | 154.76 | 85.58 | 138.06 | 69.51 | 97.82 | 121.65 |
| 6 | OLS | 3416.08 | 1453.28 | 3740.49 | 2115.34 | 3820.92 | 1828.70 | 3939.45 | 1978.31 | 3540.52 | 1645.90 | 3666.41 | 1785.13 | 3844.98 | 2133.05 | 3598.89 | 1964.95 | 3568.65 | 1669.64 | 3469.61 | 2291.74 |
| | AIC B | 3220.16 | 1383.38 | 3589.31 | 2034.33 | 3636.60 | 1795.53 | 3781.95 | 1993.58 | 3373.34 | 1624.77 | 3483.19 | 1811.93 | 3694.69 | 2117.88 | 3393.78 | 1918.89 | 3403.66 | 1606.88 | 3306.95 | 2264.20 |
| | BIC B | 3113.66 | 1430.16 | 3460.08 | 2059.92 | 3496.18 | 1767.32 | 3590.24 | 1897.56 | 3252.85 | 1637.29 | 3340.98 | 1826.53 | 3555.73 | 2035.95 | 3262.57 | 1881.76 | 3341.54 | 1638.03 | 3152.95 | 2075.80 |
| | AIC SB | 3221.95 | 1381.55 | 3589.31 | 2034.33 | 3642.23 | 1796.25 | 3784.90 | 1991.18 | 3375.76 | 1624.44 | 3491.90 | 1814.25 | 3695.86 | 2117.27 | 3391.27 | 1917.09 | 3403.66 | 1606.88 | 3312.98 | 2263.58 |
| | BIC SB | 3113.66 | 1430.16 | 3460.08 | 2059.92 | 3496.18 | 1767.32 | 3594.29 | 1894.40 | 3250.56 | 1638.71 | 3335.71 | 1822.40 | 3554.98 | 2036.75 | 3264.74 | 1881.76 | 3342.98 | 1639.56 | 3154.19 | 2076.11 |
| | AIC F | 3196.10 | 1423.35 | 3539.03 | 2042.14 | 3578.16 | 1778.22 | 3648.79 | 1960.31 | 3349.17 | 1622.79 | 3416.14 | 1768.94 | 3540.33 | 2012.35 | 3331.11 | 1907.99 | 3324.51 | 1629.43 | 3182.74 | 2228.08 |
| | BIC F | 3108.18 | 1437.73 | 3405.44 | 2013.75 | 3398.22 | 1728.91 | 3456.21 | 1745.66 | 3219.23 | 1657.99 | 3298.42 | 1765.76 | 3466.19 | 1949.73 | 3253.74 | 1890.02 | 3248.38 | 1658.12 | 3069.18 | 2083.13 |
| | AIC SF | 3190.94 | 1402.93 | 3542.59 | 2042.87 | 3576.27 | 1776.80 | 3646.71 | 1957.36 | 3350.61 | 1622.97 | 3418.32 | 1769.22 | 3535.57 | 2017.50 | 3331.03 | 1908.06 | 3329.64 | 1629.89 | 3191.37 | 2235.85 |
| | BIC SF | 3105.66 | 1439.27 | 3404.96 | 2014.40 | 3398.22 | 1728.91 | 3455.33 | 1743.32 | 3219.23 | 1657.99 | 3298.42 | 1765.76 | 3464.77 | 1946.41 | 3253.74 | 1890.02 | 3248.38 | 1658.12 | 3069.18 | 2083.13 |
| | Ridge | 3024.74 | 1396.41 | 3081.78 | 1349.80 | 3189.77 | 1547.37 | 3367.64 | 1560.59 | 3150.50 | 1390.92 | 3204.82 | 1537.10 | 3358.96 | 1664.95 | 2984.83 | 1620.44 | 3051.09 | 1342.73 | 3065.59 | 2025.65 |
| | Lasso | 3020.04 | 1402.02 | 3083.70 | 1351.14 | 3185.17 | 1520.39 | 3348.09 | 1556.13 | 3139.22 | 1391.06 | 3209.15 | 1547.39 | 3352.05 | 1719.77 | 2990.72 | 1642.48 | 3052.12 | 1339.77 | 3061.42 | 2046.11 |
| | E-net | 3020.38 | 1401.55 | 3083.59 | 1350.98 | 3186.40 | 1526.71 | 3346.17 | 1553.01 | 3140.15 | 1390.47 | 3207.61 | 1544.02 | 3350.89 | 1713.66 | 2989.50 | 1637.55 | 3052.69 | 1339.98 | 3061.47 | 2044.23 |
| | SCAD | 3008.60 | 1419.50 | 3336.62 | 2121.56 | 3356.30 | 1813.53 | 3531.73 | 1939.65 | 3088.41 | 1491.17 | 3209.68 | 1736.18 | 3412.80 | 1916.87 | 3068.85 | 1937.80 | 3139.39 | 1596.98 | 3111.24 | 2070.88 |
| | MCP | 3006.58 | 1409.95 | 3356.26 | 2125.56 | 3457.17 | 1809.90 | 3521.21 | 1956.99 | 3128.34 | 1482.91 | 3201.48 | 1716.84 | 3436.23 | 1965.21 | 3085.66 | 1936.54 | 3152.14 | 1564.80 | 3096.02 | 2065.46 |
| | XGBoost | 669.76 | 660.72 | 657.71 | 549.66 | 782.09 | 968.31 | 794.54 | 651.13 | 741.10 | 749.05 | 723.97 | 776.08 | 872.37 | 817.07 | 703.90 | 712.53 | 803.31 | 835.82 | 824.42 | 1410.27 |
| | RF | 1417.71 | 954.68 | 1409.67 | 818.83 | 1373.20 | 1105.85 | 965.65 | 794.34 | 1463.75 | 973.83 | 1451.43 | 1123.72 | 1099.23 | 974.36 | 1454.33 | 1093.27 | 1386.90 | 927.00 | 1141.59 | 1556.76 |
| | SVM | 2073.77 | 1075.82 | 2029.33 | 1045.37 | 1686.63 | 1297.79 | 1030.44 | 1088.13 | 2170.74 | 1133.48 | 1865.53 | 1152.00 | 1200.73 | 1108.62 | 2025.37 | 1270.25 | 1760.98 | 1023.32 | 1157.63 | 1691.99 |

Table 47: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 50$ and $p = 100$. See Figure 47 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 22.46 | 4.48 | 21.00 | 4.44 | 17.33 | 3.89 | 12.09 | 3.35 | 24.14 | 4.26 | 24.94 | 4.11 | 23.61 | 4.28 | 24.39 | 5.31 | 20.61 | 4.02 | 15.06 | 3.06 |
| | Lasso | 11.13 | 3.28 | 10.88 | 3.31 | 10.94 | 3.61 | 11.79 | 3.36 | 11.29 | 3.28 | 10.71 | 2.79 | 10.23 | 2.85 | 10.59 | 2.90 | 10.62 | 2.56 | 10.77 | 3.11 |
| | E-net | 11.46 | 3.40 | 11.02 | 3.32 | 11.15 | 3.63 | 11.69 | 3.29 | 11.63 | 3.44 | 10.95 | 2.84 | 10.28 | 2.86 | 10.80 | 2.96 | 10.72 | 2.55 | 10.78 | 3.03 |
| | SCAD | 8.45 | 1.99 | 8.67 | 2.23 | 9.18 | 3.17 | 11.61 | 3.64 | 8.46 | 2.01 | 8.32 | 1.85 | 9.36 | 3.04 | 8.22 | 1.91 | 9.41 | 2.77 | 10.65 | 3.26 |
| | MCP | 8.46 | 2.01 | 8.61 | 2.14 | 9.82 | 4.39 | 11.41 | 3.56 | 8.41 | 2.00 | 8.25 | 1.89 | 10.15 | 3.41 | 8.22 | 1.84 | 9.43 | 2.81 | 10.95 | 3.51 |
| | XGBoost | 7.95 | 2.54 | 7.82 | 2.66 | 7.16 | 2.40 | 4.69 | 1.67 | 8.16 | 2.78 | 8.09 | 3.13 | 6.04 | 2.01 | 7.54 | 2.53 | 7.22 | 4.49 | 4.46 | 1.76 |
| | RF | 11.64 | 2.99 | 11.12 | 3.26 | 9.64 | 2.62 | 5.06 | 1.64 | 12.73 | 3.52 | 12.63 | 3.77 | 7.51 | 2.13 | 11.33 | 3.34 | 9.05 | 2.33 | 4.76 | 1.87 |
| | SVM | 19.53 | 3.99 | 18.14 | 3.88 | 15.07 | 3.58 | 7.61 | 3.90 | 20.97 | 3.88 | 20.49 | 3.54 | 17.73 | 3.65 | 19.97 | 3.97 | 17.31 | 3.66 | 12.68 | 4.33 |
| 3 | Ridge | 279.04 | 94.20 | 272.39 | 92.06 | 299.31 | 111.12 | 281.15 | 159.29 | 277.87 | 94.00 | 282.91 | 84.54 | 314.01 | 106.52 | 304.34 | 112.15 | 307.88 | 98.93 | 307.68 | 135.90 |
| | Lasso | 254.68 | 95.46 | 244.52 | 93.27 | 280.59 | 115.68 | 272.69 | 158.47 | 256.70 | 96.59 | 245.20 | 85.85 | 271.00 | 114.54 | 272.29 | 116.03 | 270.35 | 110.97 | 289.46 | 136.46 |
| | E-net | 256.19 | 94.79 | 245.59 | 93.36 | 281.24 | 116.18 | 271.72 | 157.98 | 257.71 | 96.41 | 247.60 | 85.85 | 271.36 | 114.54 | 274.11 | 115.69 | 272.29 | 111.07 | 288.22 | 135.85 |
| | SCAD | 222.48 | 92.05 | 204.76 | 90.77 | 240.74 | 101.40 | 249.51 | 118.57 | 231.50 | 98.23 | 208.02 | 84.60 | 226.28 | 97.39 | 240.04 | 120.37 | 229.40 | 101.26 | 248.19 | 132.88 |
| | MCP | 221.60 | 90.35 | 207.55 | 96.46 | 247.56 | 104.83 | 254.03 | 120.70 | 221.68 | 96.29 | 206.34 | 85.85 | 223.10 | 95.00 | 239.34 | 122.18 | 232.72 | 104.90 | 250.31 | 138.03 |
| | XGBoost | 151.10 | 67.73 | 135.08 | 59.94 | 137.33 | 63.55 | 81.95 | 55.37 | 158.40 | 76.84 | 151.10 | 73.15 | 111.19 | 53.83 | 167.93 | 97.42 | 138.56 | 66.47 | 90.12 | 66.53 |
| | RF | 202.65 | 78.08 | 186.54 | 80.09 | 192.55 | 74.87 | 90.52 | 64.95 | 201.31 | 85.72 | 194.62 | 74.74 | 137.22 | 62.52 | 218.01 | 97.69 | 183.11 | 71.31 | 106.44 | 75.65 |
| | SVM | 263.83 | 94.34 | 235.11 | 88.03 | 215.50 | 79.88 | 101.51 | 92.90 | 261.73 | 93.46 | 257.04 | 85.52 | 230.48 | 79.00 | 274.69 | 109.24 | 234.96 | 79.83 | 158.97 | 102.19 |
| 6 | Ridge | 3151.80 | 1310.95 | 2876.59 | 1215.47 | 3376.02 | 1377.19 | 3287.23 | 1781.41 | 3127.63 | 1395.41 | 3011.73 | 1207.88 | 3258.58 | 1278.07 | 3341.77 | 1643.31 | 3204.49 | 1343.21 | 3499.60 | 1672.78 |
| | Lasso | 3124.13 | 1317.89 | 2884.72 | 1256.48 | 3368.84 | 1392.12 | 3270.99 | 1781.95 | 3137.87 | 1401.69 | 3004.37 | 1207.20 | 3248.91 | 1279.02 | 3356.92 | 1663.40 | 3196.76 | 1364.80 | 3496.55 | 1690.54 |
| | E-net | 3126.36 | 1317.58 | 2881.13 | 1243.69 | 3368.48 | 1391.61 | 3261.95 | 1781.33 | 3137.77 | 1400.25 | 3004.76 | 1207.35 | 3249.32 | 1279.63 | 3353.36 | 1661.42 | 3197.81 | 1366.01 | 3495.08 | 1690.96 |
| | SCAD | 3068.49 | 1306.88 | 2804.71 | 1255.80 | 3341.16 | 1408.84 | 3560.15 | 2180.05 | 3133.93 | 1435.10 | 3011.23 | 1220.56 | 3267.35 | 1377.43 | 3389.09 | 1770.02 | 3159.79 | 1575.78 | 3520.36 | 1811.26 |
| | MCP | 3101.06 | 1320.18 | 2855.92 | 1255.17 | 3429.55 | 1483.67 | 3554.70 | 2141.29 | 3152.61 | 1461.94 | 3021.61 | 1260.19 | 3297.36 | 1345.15 | 3370.02 | 1801.84 | 3213.17 | 1610.95 | 3560.48 | 1841.78 |
| | XGBoost | 1367.70 | 850.22 | 1167.06 | 871.49 | 1164.46 | 809.21 | 867.68 | 813.63 | 1387.51 | 1147.71 | 1386.44 | 1002.48 | 1004.68 | 615.20 | 1710.75 | 1393.73 | 1191.70 | 1016.53 | 1043.00 | 1018.88 |
| | RF | 2243.56 | 1118.57 | 2006.92 | 1047.67 | 2095.75 | 1000.91 | 1104.69 | 929.39 | 2274.79 | 1234.93 | 2136.64 | 1013.60 | 1594.29 | 876.68 | 2476.77 | 1490.61 | 2031.75 | 1054.92 | 1330.42 | 1049.45 |
| | SVM | 3115.70 | 1335.92 | 2745.72 | 1234.93 | 2674.80 | 1168.25 | 1251.15 | 1150.82 | 3106.22 | 1411.77 | 2959.97 | 1262.70 | 2835.28 | 1102.72 | 3261.57 | 1653.97 | 2835.09 | 1226.89 | 1875.05 | 1217.84 |

Table 48: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 50$ and $p = 2000$. See Figure 48 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 22.28 | 4.18 | 23.02 | 5.74 | 16.87 | 3.31 | 11.25 | 2.55 | 24.33 | 4.80 | 26.82 | 4.75 | 42.20 | 7.93 | 28.12 | 5.41 | 27.83 | 7.29 | 18.77 | 5.66 |
| | Lasso | 15.83 | 5.25 | 13.57 | 4.45 | 13.04 | 3.84 | 11.74 | 3.16 | 14.86 | 4.62 | 14.61 | 5.20 | 11.10 | 4.23 | 13.46 | 4.67 | 12.73 | 4.34 | 12.10 | 3.64 |
| | E-net | 16.39 | 5.15 | 14.04 | 4.52 | 13.33 | 3.77 | 11.61 | 3.13 | 15.55 | 4.54 | 15.28 | 5.17 | 11.32 | 4.50 | 14.05 | 4.69 | 13.09 | 4.43 | 12.06 | 3.63 |
| | SCAD | 10.53 | 4.87 | 9.97 | 4.59 | 10.88 | 3.46 | 12.10 | 3.08 | 9.80 | 3.48 | 9.86 | 3.55 | 10.73 | 3.43 | 9.59 | 2.81 | 10.83 | 3.91 | 11.94 | 3.18 |
| | MCP | 10.52 | 4.75 | 9.97 | 4.11 | 11.76 | 4.87 | 12.56 | 3.30 | 9.63 | 3.51 | 9.60 | 3.64 | 11.36 | 3.87 | 9.16 | 2.74 | 11.31 | 4.88 | 11.90 | 3.08 |
| | XGBoost | 12.72 | 4.76 | 11.39 | 3.25 | 10.38 | 3.49 | 5.45 | 2.00 | 12.88 | 4.46 | 12.35 | 5.08 | 6.96 | 2.84 | 11.07 | 3.73 | 9.23 | 3.10 | 4.98 | 1.70 |
| | RF | 17.40 | 4.68 | 15.76 | 4.05 | 12.84 | 3.12 | 5.76 | 1.43 | 18.34 | 4.58 | 18.84 | 4.80 | 10.85 | 3.77 | 16.60 | 4.52 | 13.52 | 4.01 | 6.10 | 1.96 |
| | SVM | 22.20 | 4.06 | 20.82 | 4.50 | 16.42 | 3.78 | 7.52 | 3.42 | 24.20 | 4.85 | 26.57 | 4.81 | 40.28 | 7.62 | 26.76 | 5.06 | 28.76 | 5.69 | 26.08 | 4.72 |
| 3 | Ridge | 275.16 | 101.18 | 274.34 | 81.95 | 267.40 | 99.70 | 222.66 | 111.16 | 294.30 | 125.36 | 296.19 | 103.90 | 366.93 | 136.71 | 300.56 | 126.20 | 333.43 | 128.76 | 307.60 | 128.09 |
| | Lasso | 263.78 | 106.37 | 259.03 | 86.10 | 266.19 | 98.18 | 253.56 | 120.06 | 278.18 | 124.10 | 275.74 | 102.28 | 294.35 | 126.01 | 281.60 | 133.60 | 295.15 | 125.50 | 267.06 | 128.52 |
| | E-net | 264.84 | 105.92 | 260.23 | 85.62 | 266.55 | 98.06 | 253.28 | 123.29 | 279.82 | 124.30 | 277.70 | 102.51 | 296.83 | 126.31 | 283.11 | 133.08 | 297.61 | 125.79 | 266.72 | 129.77 |
| | SCAD | 242.80 | 109.09 | 226.29 | 80.95 | 231.12 | 96.56 | 226.90 | 109.14 | 250.99 | 114.91 | 246.71 | 106.13 | 248.97 | 119.65 | 257.90 | 144.30 | 257.02 | 112.33 | 241.06 | 106.89 |
| | MCP | 235.55 | 106.41 | 226.08 | 87.85 | 251.38 | 111.61 | 237.57 | 110.55 | 246.23 | 117.76 | 241.28 | 105.98 | 246.38 | 121.08 | 249.24 | 129.56 | 253.87 | 121.25 | 244.22 | 103.09 |
| | XGBoost | 258.07 | 111.22 | 230.48 | 82.95 | 199.59 | 95.53 | 83.02 | 45.50 | 252.08 | 116.29 | 243.70 | 94.71 | 195.07 | 104.72 | 257.87 | 115.33 | 237.73 | 100.72 | 103.24 | 56.70 |
| | RF | 251.20 | 101.43 | 229.58 | 77.51 | 204.78 | 81.02 | 83.59 | 45.67 | 261.98 | 119.43 | 255.23 | 99.60 | 201.75 | 112.10 | 258.91 | 118.13 | 242.62 | 106.24 | 115.44 | 66.04 |
| | SVM | 275.92 | 103.66 | 251.44 | 78.91 | 215.99 | 91.21 | 93.20 | 63.70 | 294.24 | 128.01 | 296.29 | 105.01 | 359.97 | 136.25 | 294.67 | 127.87 | 310.23 | 118.27 | 260.09 | 101.35 |
| 6 | Ridge | 3162.64 | 1580.01 | 2974.67 | 1140.33 | 3104.03 | 1429.27 | 3099.37 | 1559.22 | 3342.73 | 1853.27 | 3184.88 | 1486.69 | 3504.06 | 1670.63 | 3291.90 | 1731.31 | 3470.73 | 1560.07 | 3207.90 | 1468.19 |
| | Lasso | 3161.45 | 1581.05 | 2975.47 | 1136.57 | 3122.67 | 1435.69 | 3107.47 | 1551.61 | 3346.18 | 1853.53 | 3188.95 | 1497.14 | 3453.56 | 1623.46 | 3284.44 | 1734.65 | 3453.57 | 1541.20 | 3157.81 | 1479.73 |
| | E-net | 3161.64 | 1580.99 | 2972.68 | 1135.87 | 3123.16 | 1436.00 | 3111.79 | 1557.54 | 3347.47 | 1853.02 | 3187.51 | 1496.30 | 3455.51 | 1627.47 | 3285.39 | 1733.96 | 3450.40 | 1543.86 | 3157.80 | 1478.02 |
| | SCAD | 3224.52 | 1631.18 | 3050.92 | 1237.75 | 3066.71 | 1373.85 | 3122.84 | 1590.92 | 3499.15 | 1931.62 | 3244.93 | 1537.01 | 3427.21 | 1544.75 | 3294.07 | 1730.88 | 3426.82 | 1541.69 | 3222.48 | 1665.21 |
| | MCP | 3188.01 | 1592.86 | 3039.49 | 1222.96 | 3115.90 | 1410.48 | 3191.00 | 1608.55 | 3506.72 | 1966.68 | 3228.99 | 1577.52 | 3428.71 | 1566.27 | 3309.53 | 1735.73 | 3460.21 | 1569.71 | 3336.00 | 1728.81 |
| | XGBoost | 2845.99 | 1614.96 | 2444.29 | 1142.57 | 1945.23 | 1390.77 | 829.71 | 637.82 | 2751.56 | 1539.94 | 2913.11 | 1466.27 | 2426.51 | 1529.11 | 2932.59 | 1561.86 | 2891.76 | 2028.38 | 1494.57 | 1348.33 |
| | RF | 2958.06 | 1550.83 | 2659.94 | 1066.64 | 2400.91 | 1193.17 | 1032.01 | 668.38 | 3101.20 | 1793.24 | 2969.93 | 1414.42 | 2668.81 | 1534.78 | 3036.09 | 1600.36 | 2977.22 | 1384.81 | 1607.95 | 982.46 |
| | SVM | 3170.45 | 1604.25 | 2877.11 | 1144.59 | 2540.77 | 1262.32 | 1132.02 | 822.15 | 3353.56 | 1887.85 | 3204.39 | 1517.47 | 3499.77 | 1701.79 | 3275.51 | 1756.74 | 3430.75 | 1544.96 | 2961.02 | 1378.05 |

Table 49: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 200$ and $p = 10$. See Figure 49 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 7.13 | 0.93 | 7.12 | 0.79 | 7.33 | 1.06 | 8.32 | 1.20 | 6.99 | 0.82 | 7.07 | 0.85 | 7.26 | 1.06 | 6.93 | 0.83 | 6.99 | 0.92 | 7.05 | 1.12 |
| | AIC B | 7.08 | 0.94 | 7.11 | 0.81 | 7.34 | 1.05 | 8.24 | 1.21 | 6.99 | 0.83 | 7.10 | 0.86 | 7.21 | 1.06 | 6.95 | 0.82 | 6.99 | 0.91 | 7.02 | 1.12 |
| | BIC B | 7.12 | 0.92 | 7.17 | 0.81 | 7.43 | 1.03 | 8.18 | 1.17 | 7.04 | 0.83 | 7.17 | 0.85 | 7.17 | 1.05 | 7.05 | 0.78 | 7.03 | 0.91 | 6.99 | 1.10 |
| | AIC SB | 7.08 | 0.94 | 7.11 | 0.81 | 7.34 | 1.05 | 8.24 | 1.21 | 6.99 | 0.83 | 7.09 | 0.86 | 7.21 | 1.05 | 6.95 | 0.82 | 6.99 | 0.91 | 7.02 | 1.12 |
| | BIC SB | 7.12 | 0.92 | 7.17 | 0.81 | 7.43 | 1.03 | 8.18 | 1.17 | 7.04 | 0.83 | 7.17 | 0.86 | 7.17 | 1.05 | 7.05 | 0.78 | 7.03 | 0.91 | 6.99 | 1.10 |
| | AIC F | 7.09 | 0.94 | 7.11 | 0.81 | 7.33 | 1.05 | 8.22 | 1.20 | 6.98 | 0.83 | 7.09 | 0.86 | 7.19 | 1.06 | 6.95 | 0.82 | 6.99 | 0.91 | 7.01 | 1.13 |
| | BIC F | 7.12 | 0.92 | 7.18 | 0.81 | 7.43 | 1.03 | 8.18 | 1.17 | 7.04 | 0.83 | 7.17 | 0.85 | 7.18 | 1.06 | 7.04 | 0.78 | 7.04 | 0.90 | 6.98 | 1.10 |
| | AIC SF | 7.09 | 0.94 | 7.11 | 0.81 | 7.33 | 1.05 | 8.22 | 1.20 | 6.98 | 0.83 | 7.09 | 0.86 | 7.19 | 1.06 | 6.96 | 0.81 | 6.99 | 0.91 | 7.01 | 1.12 |
| | BIC SF | 7.12 | 0.92 | 7.18 | 0.81 | 7.43 | 1.03 | 8.18 | 1.17 | 7.04 | 0.83 | 7.17 | 0.85 | 7.18 | 1.06 | 7.04 | 0.78 | 7.03 | 0.90 | 6.98 | 1.10 |
| | Ridge | 7.78 | 1.01 | 7.94 | 0.99 | 8.00 | 1.05 | 9.23 | 1.33 | 7.70 | 1.00 | 7.90 | 1.00 | 8.18 | 1.32 | 7.80 | 1.10 | 7.72 | 1.10 | 8.01 | 1.26 |
| | Lasso | 7.65 | 1.00 | 7.74 | 0.95 | 7.83 | 1.03 | 8.89 | 1.30 | 7.60 | 1.01 | 7.75 | 1.05 | 7.97 | 1.23 | 7.67 | 1.01 | 7.54 | 1.03 | 7.80 | 1.19 |
| | E-net | 7.65 | 0.99 | 7.74 | 0.94 | 7.81 | 1.02 | 8.92 | 1.31 | 7.60 | 1.01 | 7.75 | 1.05 | 8.00 | 1.28 | 7.67 | 1.01 | 7.53 | 1.04 | 7.79 | 1.19 |
| | SCAD | 7.10 | 0.92 | 7.15 | 0.80 | 7.38 | 1.04 | 8.18 | 1.16 | 7.01 | 0.82 | 7.13 | 0.85 | 7.20 | 1.03 | 7.01 | 0.78 | 7.02 | 0.90 | 7.01 | 1.12 |
| | MCP | 7.10 | 0.92 | 7.16 | 0.80 | 7.38 | 1.05 | 8.19 | 1.15 | 7.02 | 0.83 | 7.15 | 0.85 | 7.23 | 1.07 | 7.02 | 0.78 | 7.03 | 0.90 | 7.01 | 1.13 |
| | XGBoost | 2.32 | 0.44 | 2.28 | 0.40 | 2.30 | 0.49 | 2.08 | 0.43 | 2.24 | 0.38 | 2.25 | 0.34 | 2.15 | 0.42 | 2.25 | 0.32 | 2.22 | 0.36 | 2.08 | 0.33 |
| | RF | 3.99 | 0.72 | 3.94 | 0.71 | 3.29 | 0.60 | 2.09 | 0.44 | 3.92 | 0.76 | 3.73 | 0.72 | 2.59 | 0.49 | 3.91 | 0.61 | 3.64 | 0.64 | 3.00 | 0.55 |
| | SVM | 6.97 | 0.89 | 6.99 | 0.94 | 6.20 | 1.18 | 3.88 | 1.35 | 7.01 | 0.91 | 6.70 | 1.00 | 4.74 | 1.18 | 6.89 | 0.81 | 6.12 | 0.85 | 4.10 | 0.67 |
| 3 | OLS | 188.43 | 43.24 | 191.74 | 43.63 | 195.38 | 50.87 | 194.36 | 52.23 | 180.64 | 39.63 | 183.76 | 47.66 | 187.32 | 48.15 | 181.68 | 41.70 | 186.22 | 49.04 | 181.74 | 45.58 |
| | AIC B | 186.50 | 43.45 | 190.96 | 43.48 | 194.56 | 51.44 | 192.46 | 52.15 | 178.73 | 39.87 | 182.87 | 47.08 | 185.88 | 49.27 | 180.33 | 41.27 | 184.47 | 48.25 | 179.25 | 44.80 |
| | BIC B | 185.66 | 42.12 | 188.93 | 42.90 | 192.21 | 51.68 | 190.72 | 52.36 | 177.73 | 40.44 | 181.47 | 47.70 | 184.71 | 49.44 | 179.86 | 42.37 | 183.95 | 47.62 | 177.51 | 43.72 |
| | AIC SB | 186.50 | 43.45 | 190.96 | 43.48 | 194.56 | 51.44 | 192.46 | 52.15 | 178.73 | 39.87 | 182.85 | 47.07 | 185.88 | 49.27 | 180.33 | 41.27 | 184.47 | 48.25 | 179.25 | 44.80 |
| | BIC SB | 185.66 | 42.12 | 188.93 | 42.90 | 192.21 | 51.68 | 190.72 | 52.36 | 177.73 | 40.44 | 181.47 | 47.70 | 184.58 | 49.42 | 179.87 | 42.35 | 183.95 | 47.62 | 177.51 | 43.72 |
| | AIC F | 186.31 | 42.89 | 190.75 | 43.32 | 194.40 | 51.64 | 192.09 | 52.27 | 178.65 | 40.04 | 182.41 | 47.39 | 184.54 | 49.44 | 180.34 | 41.30 | 184.19 | 48.00 | 178.54 | 44.71 |
| | BIC F | 185.38 | 41.95 | 189.04 | 42.80 | 192.16 | 51.72 | 190.20 | 52.45 | 177.76 | 40.38 | 181.31 | 47.75 | 183.49 | 48.48 | 179.60 | 42.60 | 184.08 | 47.54 | 177.65 | 43.94 |
| | AIC SF | 186.31 | 42.89 | 190.75 | 43.32 | 194.40 | 51.64 | 192.09 | 52.27 | 178.65 | 40.04 | 182.44 | 47.39 | 184.56 | 49.57 | 180.37 | 41.31 | 184.19 | 48.00 | 178.54 | 44.71 |
| | BIC SF | 185.38 | 41.95 | 189.04 | 42.80 | 192.16 | 51.72 | 190.20 | 52.45 | 177.76 | 40.38 | 181.35 | 47.71 | 183.46 | 48.50 | 179.60 | 42.60 | 184.08 | 47.54 | 177.62 | 43.97 |
| | Ridge | 219.63 | 46.06 | 225.25 | 49.90 | 228.86 | 56.31 | 223.26 | 67.66 | 220.25 | 47.96 | 221.13 | 60.63 | 222.01 | 61.44 | 217.63 | 51.45 | 219.68 | 52.47 | 215.48 | 57.48 |
| | Lasso | 209.98 | 45.23 | 215.02 | 48.24 | 219.94 | 57.03 | 218.19 | 65.89 | 211.81 | 46.35 | 213.58 | 58.13 | 215.59 | 60.20 | 208.58 | 51.04 | 213.19 | 52.02 | 210.28 | 59.13 |
| | E-net | 210.73 | 45.58 | 215.76 | 48.53 | 220.48 | 57.72 | 218.03 | 65.53 | 212.25 | 46.78 | 213.85 | 58.10 | 216.11 | 60.55 | 209.22 | 51.32 | 213.95 | 51.95 | 211.06 | 59.45 |
| | SCAD | 186.08 | 42.85 | 188.83 | 42.61 | 192.99 | 51.31 | 191.85 | 52.87 | 177.39 | 40.76 | 181.26 | 47.99 | 184.72 | 49.08 | 178.86 | 43.13 | 184.43 | 48.19 | 179.24 | 44.33 |
| | MCP | 186.24 | 42.64 | 188.90 | 42.41 | 193.11 | 51.20 | 192.05 | 52.85 | 177.88 | 40.13 | 181.41 | 47.75 | 184.97 | 49.94 | 178.78 | 42.83 | 185.68 | 48.82 | 179.27 | 44.45 |
| | XGBoost | 24.56 | 10.14 | 27.63 | 11.80 | 27.83 | 13.69 | 28.94 | 15.45 | 25.02 | 13.49 | 25.64 | 11.76 | 27.61 | 10.74 | 25.35 | 10.61 | 26.94 | 12.12 | 27.80 | 11.71 |
| | RF | 65.08 | 23.82 | 68.40 | 22.10 | 58.64 | 23.79 | 34.99 | 16.74 | 62.17 | 21.72 | 62.53 | 25.92 | 42.63 | 17.45 | 61.70 | 21.24 | 64.87 | 24.66 | 48.05 | 17.66 |
| | SVM | 73.56 | 20.85 | 74.57 | 21.07 | 63.36 | 28.47 | 37.65 | 28.71 | 72.48 | 19.71 | 70.16 | 26.74 | 43.02 | 25.66 | 71.37 | 22.38 | 67.09 | 25.17 | 38.73 | 15.91 |
| 6 | OLS | 2843.38 | 666.76 | 2886.06 | 687.68 | 2929.16 | 796.89 | 2893.56 | 838.09 | 2716.47 | 618.83 | 2775.74 | 755.44 | 2811.58 | 752.39 | 2732.13 | 655.64 | 2807.69 | 775.50 | 2748.06 | 722.34 |
| | AIC B | 2801.08 | 663.10 | 2847.87 | 684.89 | 2898.66 | 809.57 | 2857.72 | 831.74 | 2673.40 | 616.50 | 2738.28 | 751.61 | 2775.52 | 755.02 | 2699.04 | 661.89 | 2765.32 | 772.39 | 2714.70 | 721.42 |
| | BIC B | 2750.01 | 654.65 | 2796.68 | 674.66 | 2839.12 | 800.56 | 2819.68 | 830.54 | 2613.25 | 621.72 | 2675.47 | 745.26 | 2756.36 | 760.71 | 2656.22 | 665.34 | 2732.05 | 754.82 | 2677.76 | 707.14 |
| | AIC SB | 2801.08 | 663.10 | 2847.87 | 684.89 | 2898.66 | 809.57 | 2857.72 | 831.74 | 2674.60 | 615.79 | 2738.28 | 751.61 | 2775.52 | 755.02 | 2699.04 | 661.89 | 2765.32 | 772.39 | 2714.70 | 721.42 |
| | BIC SB | 2750.01 | 654.65 | 2796.68 | 674.66 | 2839.12 | 800.56 | 2819.68 | 830.54 | 2613.25 | 621.72 | 2675.73 | 745.46 | 2756.36 | 760.71 | 2656.22 | 665.34 | 2732.05 | 754.82 | 2677.76 | 707.14 |
| | AIC F | 2798.82 | 660.67 | 2847.51 | 685.20 | 2889.62 | 811.86 | 2848.40 | 821.62 | 2669.40 | 612.51 | 2730.16 | 755.99 | 2753.01 | 751.17 | 2696.02 | 664.00 | 2761.24 | 768.80 | 2700.88 | 721.60 |
| | BIC F | 2750.01 | 654.65 | 2797.16 | 678.32 | 2835.04 | 802.82 | 2807.31 | 816.88 | 2611.69 | 620.24 | 2672.55 | 747.10 | 2731.89 | 768.30 | 2654.23 | 669.02 | 2727.40 | 758.85 | 2671.09 | 709.06 |
| | AIC SF | 2798.82 | 660.67 | 2847.51 | 685.20 | 2889.46 | 811.96 | 2848.40 | 821.62 | 2669.40 | 612.51 | 2730.60 | 755.93 | 2751.38 | 751.00 | 2695.72 | 663.91 | 2761.24 | 768.80 | 2702.28 | 722.86 |
| | BIC SF | 2750.01 | 654.65 | 2797.16 | 678.32 | 2835.04 | 802.82 | 2807.31 | 816.88 | 2611.69 | 620.24 | 2672.55 | 747.10 | 2731.89 | 768.30 | 2654.23 | 669.02 | 2727.40 | 758.85 | 2671.09 | 709.06 |
| | Ridge | 2949.87 | 663.09 | 3028.22 | 673.07 | 3120.98 | 809.59 | 3111.91 | 920.28 | 2881.42 | 643.36 | 2980.23 | 759.95 | 3049.81 | 792.40 | 2888.26 | 703.58 | 3005.56 | 773.77 | 2916.64 | 737.94 |
| | Lasso | 2933.37 | 665.42 | 3004.25 | 674.97 | 3099.63 | 815.83 | 3093.25 | 925.30 | 2871.14 | 645.92 | 2964.88 | 761.53 | 3035.75 | 800.25 | 2877.75 | 708.28 | 2993.85 | 775.68 | 2905.24 | 743.55 |
| | E-net | 2933.80 | 665.13 | 3006.87 | 674.09 | 3100.70 | 815.76 | 3094.34 | 925.02 | 2872.16 | 645.24 | 2967.23 | 761.42 | 3036.18 | 800.92 | 2878.16 | 708.20 | 2994.19 | 775.20 | 2905.94 | 743.35 |
| | SCAD | 2765.01 | 667.33 | 2805.25 | 685.93 | 2842.93 | 800.46 | 2857.67 | 836.40 | 2624.79 | 630.71 | 2697.69 | 746.83 | 2749.46 | 758.05 | 2655.23 | 692.99 | 2743.85 | 763.93 | 2692.26 | 707.46 |
| | MCP | 2764.08 | 664.05 | 2805.50 | 681.74 | 2850.51 | 801.61 | 2847.17 | 836.86 | 2620.82 | 636.40 | 2700.59 | 744.39 | 2740.88 | 765.51 | 2654.15 | 693.92 | 2738.18 | 755.57 | 2681.04 | 697.26 |
| | XGBoost | 190.56 | 147.80 | 221.67 | 162.82 | 224.52 | 197.53 | 266.47 | 231.29 | 191.43 | 223.78 | 204.59 | 162.52 | 234.98 | 157.48 | 191.65 | 151.55 | 226.31 | 185.22 | 247.03 | 182.52 |
| | RF | 628.39 | 316.62 | 653.49 | 296.42 | 580.00 | 331.42 | 371.76 | 250.63 | 566.90 | 282.04 | 576.37 | 345.03 | 379.97 | 233.35 | 576.74 | 297.22 | 609.49 | 335.54 | 380.92 | 188.49 |
| | SVM | 887.99 | 310.08 | 892.64 | 316.19 | 741.60 | 415.68 | 406.45 | 361.71 | 853.20 | 295.44 | 833.02 | 405.90 | 459.40 | 343.12 | 847.63 | 342.78 | 802.34 | 380.53 | 422.84 | 256.70 |

Table 50: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 200$ and $p = 100$. See Figure 50 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 13.57 | 1.99 | 13.92 | 2.31 | 14.38 | 2.55 | 15.76 | 2.37 | 13.55 | 2.60 | 13.27 | 1.90 | 13.63 | 2.56 | 13.81 | 2.13 | 14.34 | 2.12 | 15.61 | 2.57 |
| | AIC F | 10.24 | 1.70 | 10.50 | 1.80 | 10.80 | 1.70 | 11.53 | 1.71 | 10.10 | 1.53 | 9.67 | 1.57 | 8.62 | 1.50 | 10.10 | 1.58 | 10.39 | 1.54 | 9.97 | 1.84 |
| | BIC F | 7.89 | 1.04 | 7.88 | 1.15 | 8.07 | 1.15 | 8.56 | 1.18 | 7.83 | 1.13 | 7.55 | 1.13 | 7.26 | 1.09 | 7.81 | 0.98 | 7.90 | 1.08 | 8.37 | 1.33 |
| | AIC SF | 10.32 | 1.76 | 10.58 | 1.86 | 10.86 | 1.71 | 11.61 | 1.74 | 10.24 | 1.56 | 9.65 | 1.53 | 8.61 | 1.52 | 10.14 | 1.61 | 10.43 | 1.63 | 9.98 | 1.81 |
| | BIC SF | 7.89 | 1.04 | 7.89 | 1.15 | 8.07 | 1.15 | 8.56 | 1.18 | 7.82 | 1.13 | 7.54 | 1.13 | 7.27 | 1.09 | 7.81 | 0.99 | 7.90 | 1.08 | 8.37 | 1.33 |
| | Ridge | 12.48 | 1.95 | 11.94 | 1.77 | 11.29 | 1.56 | 9.96 | 1.42 | 12.21 | 1.69 | 11.31 | 1.62 | 9.47 | 1.30 | 11.79 | 1.63 | 11.05 | 1.60 | 9.96 | 1.37 |
| | Lasso | 8.22 | 1.27 | 8.11 | 1.15 | 8.35 | 1.08 | 9.11 | 1.29 | 8.19 | 1.02 | 7.86 | 1.05 | 7.90 | 1.19 | 8.10 | 1.12 | 8.24 | 1.17 | 8.91 | 1.19 |
| | E-net | 8.29 | 1.28 | 8.15 | 1.15 | 8.38 | 1.11 | 9.15 | 1.28 | 8.23 | 1.03 | 7.89 | 1.07 | 7.93 | 1.16 | 8.14 | 1.13 | 8.25 | 1.18 | 8.96 | 1.18 |
| | SCAD | 7.30 | 0.97 | 7.32 | 0.97 | 7.60 | 0.92 | 8.33 | 1.13 | 7.32 | 0.84 | 7.20 | 0.99 | 7.13 | 1.04 | 7.35 | 0.80 | 7.58 | 0.95 | 8.24 | 1.28 |
| | MCP | 7.32 | 0.97 | 7.38 | 0.96 | 7.69 | 0.93 | 8.24 | 1.07 | 7.34 | 0.86 | 7.21 | 0.99 | 7.33 | 1.19 | 7.36 | 0.78 | 7.62 | 0.95 | 8.18 | 1.32 |
| | XGBoost | 2.95 | 0.52 | 2.92 | 0.50 | 2.91 | 0.51 | 2.42 | 0.41 | 2.89 | 0.47 | 2.78 | 0.50 | 2.57 | 0.40 | 2.79 | 0.52 | 2.77 | 0.49 | 2.33 | 0.38 |
| | RF | 5.72 | 0.92 | 5.52 | 0.96 | 4.62 | 0.66 | 2.55 | 0.38 | 5.66 | 0.81 | 5.12 | 0.81 | 3.21 | 0.59 | 5.35 | 0.98 | 4.37 | 0.75 | 2.41 | 0.38 |
| | SVM | 13.89 | 1.48 | 12.75 | 1.53 | 10.11 | 1.25 | 5.13 | 0.93 | 13.65 | 1.42 | 12.93 | 1.32 | 10.54 | 1.11 | 13.09 | 1.41 | 11.61 | 1.20 | 7.55 | 0.99 |
| 3 | OLS | 355.54 | 82.14 | 360.26 | 77.76 | 354.59 | 76.34 | 352.00 | 72.20 | 349.98 | 72.29 | 342.65 | 65.96 | 348.36 | 75.89 | 358.91 | 83.01 | 357.67 | 75.44 | 366.12 | 74.19 |
| | AIC F | 262.80 | 65.20 | 262.62 | 61.35 | 266.63 | 58.66 | 261.19 | 56.15 | 262.84 | 59.61 | 246.93 | 54.09 | 218.23 | 55.03 | 263.95 | 61.68 | 258.29 | 63.08 | 238.08 | 61.59 |
| | BIC F | 202.08 | 49.96 | 198.55 | 47.51 | 201.19 | 48.57 | 194.62 | 44.79 | 201.70 | 45.39 | 195.88 | 45.60 | 189.15 | 50.27 | 204.12 | 49.58 | 195.77 | 44.13 | 199.30 | 50.66 |
| | AIC SF | 263.97 | 65.96 | 263.72 | 61.21 | 266.54 | 58.75 | 262.48 | 59.33 | 265.26 | 60.77 | 248.26 | 54.34 | 216.76 | 54.83 | 265.66 | 62.15 | 260.65 | 64.14 | 238.57 | 61.63 |
| | BIC SF | 202.15 | 50.06 | 198.55 | 47.50 | 201.28 | 48.53 | 194.57 | 44.66 | 201.74 | 45.44 | 195.82 | 45.60 | 189.18 | 50.22 | 204.20 | 49.57 | 195.95 | 44.00 | 199.30 | 50.66 |
| | Ridge | 255.57 | 51.88 | 260.53 | 49.67 | 250.56 | 58.90 | 219.51 | 53.97 | 261.12 | 45.83 | 259.43 | 50.25 | 236.93 | 60.86 | 265.14 | 58.75 | 249.64 | 55.69 | 236.69 | 69.51 |
| | Lasso | 222.00 | 56.87 | 221.45 | 49.63 | 221.76 | 54.92 | 212.76 | 52.59 | 224.64 | 50.73 | 217.90 | 48.65 | 217.07 | 58.72 | 226.08 | 58.24 | 221.52 | 59.92 | 226.28 | 65.08 |
| | E-net | 222.82 | 56.84 | 222.73 | 49.97 | 222.99 | 55.27 | 213.38 | 52.64 | 225.72 | 50.80 | 219.44 | 48.81 | 217.44 | 58.74 | 226.90 | 58.14 | 221.55 | 59.86 | 227.47 | 65.71 |
| | SCAD | 184.69 | 48.59 | 186.14 | 45.69 | 187.33 | 45.98 | 189.09 | 44.10 | 185.42 | 42.39 | 182.96 | 44.16 | 186.41 | 50.02 | 189.30 | 46.85 | 184.06 | 42.30 | 198.68 | 52.68 |
| | MCP | 185.24 | 48.46 | 187.37 | 45.81 | 189.53 | 45.43 | 188.06 | 42.84 | 185.44 | 42.23 | 183.30 | 43.66 | 188.36 | 50.87 | 189.97 | 46.32 | 185.18 | 42.09 | 197.79 | 51.21 |
| | XGBoost | 32.45 | 14.23 | 34.49 | 15.36 | 37.16 | 16.70 | 32.80 | 13.76 | 35.68 | 26.41 | 35.29 | 19.69 | 35.25 | 17.09 | 34.08 | 13.76 | 32.28 | 12.75 | 32.54 | 14.51 |
| | RF | 90.16 | 30.59 | 94.79 | 32.29 | 83.67 | 27.68 | 42.32 | 14.36 | 95.32 | 30.04 | 95.89 | 32.15 | 57.28 | 23.21 | 94.40 | 29.99 | 73.90 | 20.40 | 41.13 | 16.81 |
| | SVM | 221.97 | 50.16 | 204.54 | 44.50 | 154.46 | 37.21 | 56.48 | 23.56 | 222.90 | 42.05 | 213.16 | 44.97 | 155.78 | 33.41 | 216.39 | 46.45 | 170.95 | 31.77 | 87.89 | 35.01 |
| 6 | OLS | 5336.11 | 1310.05 | 5388.83 | 1185.49 | 5307.31 | 1195.24 | 5231.89 | 1140.97 | 5270.81 | 1105.90 | 5135.89 | 1022.73 | 5224.72 | 1152.33 | 5394.82 | 1305.70 | 5334.45 | 1187.24 | 5428.55 | 1126.30 |
| | AIC F | 3946.31 | 1012.20 | 3903.83 | 980.34 | 4001.70 | 919.61 | 3874.51 | 862.60 | 3926.27 | 866.64 | 3671.81 | 789.20 | 3276.82 | 868.26 | 3935.09 | 959.98 | 3822.21 | 967.14 | 3486.70 | 962.26 |
| | BIC F | 2951.76 | 784.90 | 2934.06 | 754.07 | 2980.67 | 755.40 | 2846.57 | 688.43 | 2989.55 | 708.58 | 2891.67 | 719.21 | 2826.02 | 809.89 | 3019.70 | 779.22 | 2874.62 | 709.38 | 2953.00 | 792.22 |
| | AIC SF | 3965.74 | 1034.64 | 3923.92 | 1006.42 | 4002.54 | 934.25 | 3874.43 | 879.36 | 3917.05 | 876.87 | 3680.04 | 800.12 | 3271.11 | 874.17 | 3952.42 | 973.09 | 3831.09 | 959.33 | 3486.52 | 960.03 |
| | BIC SF | 2951.76 | 784.90 | 2933.16 | 753.68 | 2979.63 | 755.13 | 2846.57 | 688.43 | 2988.18 | 707.78 | 2890.98 | 717.42 | 2826.24 | 809.69 | 3019.70 | 779.22 | 2875.94 | 710.50 | 2953.19 | 792.28 |
| | Ridge | 2977.85 | 778.14 | 3009.38 | 718.48 | 3087.92 | 746.63 | 3009.50 | 725.84 | 3013.87 | 657.20 | 3045.43 | 701.60 | 3137.18 | 788.02 | 3092.40 | 721.86 | 3011.63 | 655.71 | 3236.02 | 902.18 |
| | Lasso | 2968.70 | 776.01 | 2997.76 | 725.75 | 3061.34 | 737.42 | 2999.97 | 740.78 | 3001.85 | 653.98 | 3013.21 | 698.27 | 3081.30 | 780.43 | 3061.91 | 730.15 | 2973.05 | 649.07 | 3213.22 | 908.17 |
| | E-net | 2968.99 | 777.76 | 2998.53 | 725.22 | 3063.43 | 737.10 | 2999.82 | 741.30 | 3002.98 | 653.93 | 3014.77 | 698.62 | 3084.40 | 780.58 | 3062.75 | 729.56 | 2975.39 | 649.38 | 3213.99 | 908.19 |
| | SCAD | 2770.83 | 778.44 | 2783.32 | 716.44 | 2818.31 | 701.84 | 2788.38 | 692.96 | 2779.77 | 662.54 | 2724.61 | 695.82 | 2817.28 | 850.66 | 2832.96 | 725.45 | 2722.78 | 658.93 | 2932.99 | 795.94 |
| | MCP | 2752.32 | 777.89 | 2770.50 | 714.07 | 2825.19 | 699.88 | 2768.36 | 695.18 | 2759.76 | 660.63 | 2713.18 | 699.23 | 2813.45 | 851.56 | 2820.90 | 726.26 | 2718.68 | 662.70 | 2927.29 | 797.79 |
| | XGBoost | 236.16 | 205.71 | 251.33 | 209.22 | 287.38 | 231.34 | 246.37 | 183.41 | 293.97 | 431.28 | 292.62 | 280.49 | 287.83 | 262.70 | 267.14 | 205.82 | 249.46 | 158.45 | 269.38 | 224.94 |
| | RF | 809.42 | 416.37 | 831.30 | 403.60 | 761.70 | 351.66 | 416.91 | 215.47 | 847.79 | 373.15 | 862.26 | 443.68 | 531.37 | 341.56 | 861.58 | 402.62 | 675.13 | 259.25 | 434.23 | 281.80 |
| | SVM | 2864.89 | 778.83 | 2680.94 | 686.57 | 2006.52 | 552.21 | 655.75 | 313.31 | 2888.23 | 656.91 | 2796.43 | 690.69 | 2071.19 | 551.93 | 2854.65 | 702.23 | 2204.90 | 505.10 | 1079.35 | 463.73 |

Table 51: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 200$ and $p = 2000$. See Figure 51 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 22.02 | 1.86 | 19.87 | 1.99 | 15.42 | 1.66 | 10.23 | 1.37 | 23.15 | 2.16 | 26.18 | 2.55 | 28.77 | 3.14 | 22.80 | 2.23 | 17.33 | 1.80 | 11.58 | 1.37 |
| | Lasso | 8.83 | 1.20 | 8.66 | 1.13 | 8.83 | 1.20 | 9.41 | 1.41 | 8.71 | 1.13 | 8.63 | 1.20 | 8.27 | 1.31 | 8.64 | 1.10 | 8.62 | 1.31 | 9.26 | 1.19 |
| | E-net | 9.00 | 1.24 | 8.78 | 1.15 | 8.93 | 1.19 | 9.47 | 1.43 | 8.88 | 1.16 | 8.75 | 1.23 | 8.34 | 1.33 | 8.76 | 1.13 | 8.69 | 1.32 | 9.33 | 1.18 |
| | SCAD | 7.46 | 0.91 | 7.42 | 0.94 | 7.50 | 0.81 | 8.79 | 1.51 | 7.34 | 0.88 | 7.55 | 0.90 | 7.36 | 1.10 | 7.53 | 0.84 | 7.68 | 1.15 | 8.68 | 1.43 |
| | MCP | 7.47 | 0.93 | 7.46 | 0.95 | 7.57 | 0.82 | 8.70 | 1.52 | 7.33 | 0.87 | 7.53 | 0.89 | 7.53 | 1.25 | 7.57 | 0.89 | 7.70 | 1.20 | 8.62 | 1.38 |
| | XGBoost | 3.99 | 0.81 | 3.98 | 0.82 | 3.96 | 0.75 | 2.89 | 0.51 | 3.77 | 0.64 | 3.62 | 0.63 | 3.15 | 0.63 | 3.68 | 0.77 | 3.50 | 0.75 | 2.67 | 0.51 |
| | RF | 6.87 | 0.99 | 6.74 | 1.10 | 5.99 | 1.02 | 3.18 | 0.55 | 7.03 | 1.03 | 7.01 | 1.20 | 4.18 | 0.93 | 6.91 | 1.11 | 5.45 | 0.90 | 2.86 | 0.53 |
| | SVM | 21.44 | 1.85 | 18.94 | 1.69 | 14.28 | 1.54 | 5.96 | 1.34 | 22.42 | 2.09 | 25.07 | 2.37 | 31.43 | 3.24 | 22.67 | 1.96 | 18.55 | 1.69 | 13.20 | 1.35 |
| 3 | Ridge | 264.65 | 49.76 | 277.61 | 55.95 | 238.86 | 54.98 | 207.60 | 56.09 | 269.78 | 46.64 | 290.98 | 50.37 | 329.44 | 67.21 | 286.34 | 48.06 | 284.19 | 64.91 | 252.66 | 68.12 |
| | Lasso | 226.78 | 49.23 | 231.17 | 52.21 | 228.25 | 62.41 | 228.49 | 63.28 | 232.68 | 50.76 | 230.02 | 51.30 | 230.36 | 59.22 | 228.57 | 51.93 | 230.16 | 59.14 | 228.71 | 65.49 |
| | E-net | 228.51 | 49.35 | 232.95 | 52.45 | 229.53 | 62.87 | 228.49 | 63.23 | 233.97 | 50.62 | 231.89 | 51.32 | 231.61 | 60.01 | 230.51 | 52.17 | 231.97 | 59.23 | 229.19 | 65.36 |
| | SCAD | 188.46 | 44.11 | 191.52 | 47.54 | 183.35 | 45.61 | 203.16 | 52.10 | 187.53 | 41.85 | 189.40 | 44.09 | 193.42 | 45.37 | 191.68 | 45.29 | 194.93 | 52.10 | 190.05 | 45.17 |
| | MCP | 187.53 | 44.11 | 191.81 | 47.35 | 185.29 | 46.61 | 202.55 | 52.13 | 185.95 | 41.10 | 188.94 | 43.52 | 193.67 | 45.63 | 190.86 | 44.64 | 195.24 | 52.51 | 189.40 | 44.01 |
| | XGBoost | 49.38 | 20.14 | 52.66 | 21.06 | 52.80 | 20.08 | 44.58 | 20.34 | 48.15 | 19.94 | 50.34 | 22.23 | 50.11 | 20.98 | 51.03 | 23.54 | 51.18 | 27.73 | 37.42 | 15.00 |
| | RF | 120.50 | 33.31 | 131.89 | 38.30 | 110.43 | 30.34 | 57.06 | 23.27 | 120.12 | 31.62 | 130.23 | 35.57 | 81.58 | 28.55 | 127.42 | 37.25 | 105.79 | 38.66 | 50.84 | 20.46 |
| | SVM | 262.24 | 50.48 | 249.18 | 49.91 | 188.26 | 40.89 | 71.91 | 36.45 | 266.25 | 47.08 | 284.46 | 50.94 | 302.19 | 58.79 | 267.24 | 47.41 | 246.31 | 59.10 | 175.19 | 39.40 |
| 6 | Ridge | 2969.87 | 716.41 | 3092.28 | 753.30 | 3044.21 | 788.25 | 3067.23 | 857.22 | 3049.50 | 727.16 | 3111.77 | 713.23 | 3259.78 | 777.73 | 3085.27 | 711.92 | 3169.32 | 869.97 | 3144.13 | 757.93 |
| | Lasso | 2959.77 | 720.44 | 3076.83 | 755.18 | 3043.90 | 777.63 | 3133.14 | 841.43 | 3039.29 | 731.23 | 3086.85 | 713.38 | 3194.77 | 815.04 | 3068.63 | 714.58 | 3143.84 | 878.84 | 3108.78 | 759.92 |
| | E-net | 2960.61 | 720.02 | 3078.60 | 756.22 | 3043.09 | 778.56 | 3131.90 | 841.42 | 3040.40 | 730.88 | 3089.98 | 714.03 | 3196.62 | 813.87 | 3069.46 | 714.68 | 3146.46 | 878.36 | 3107.50 | 757.24 |
| | SCAD | 2821.62 | 702.21 | 2895.28 | 749.72 | 2778.52 | 691.05 | 2889.99 | 795.63 | 2887.97 | 702.88 | 2876.96 | 704.22 | 2928.42 | 736.85 | 2859.75 | 720.21 | 2899.14 | 847.80 | 2826.62 | 685.76 |
| | MCP | 2799.40 | 706.73 | 2887.96 | 753.82 | 2787.77 | 714.04 | 2929.79 | 814.19 | 2850.15 | 709.51 | 2839.83 | 706.98 | 2914.90 | 740.99 | 2821.11 | 719.29 | 2874.97 | 839.09 | 2846.78 | 699.95 |
| | XGBoost | 406.09 | 271.79 | 420.99 | 307.56 | 364.75 | 245.11 | 344.49 | 298.76 | 406.84 | 274.39 | 404.35 | 287.00 | 398.90 | 260.85 | 437.19 | 304.72 | 428.11 | 350.26 | 270.63 | 185.45 |
| | RF | 1034.77 | 422.05 | 1096.10 | 458.02 | 931.69 | 378.13 | 584.70 | 343.09 | 1066.04 | 434.42 | 1119.44 | 462.41 | 748.68 | 383.72 | 1095.63 | 470.63 | 981.70 | 533.17 | 513.48 | 276.57 |
| | SVM | 2969.59 | 725.72 | 2927.46 | 731.24 | 2285.71 | 588.44 | 853.28 | 467.23 | 3042.26 | 735.78 | 3106.35 | 719.42 | 3191.85 | 784.46 | 3045.24 | 713.01 | 2976.76 | 875.66 | 2242.13 | 566.79 |

Table 52: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 1000$ and $p = 10$. See Figure 52 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 6.83 | 0.37 | 6.91 | 0.38 | 7.01 | 0.39 | 7.78 | 0.56 | 6.76 | 0.36 | 6.83 | 0.34 | 6.89 | 0.49 | 6.68 | 0.34 | 6.74 | 0.37 | 6.74 | 0.42 |
| | AIC B | 6.81 | 0.37 | 6.90 | 0.38 | 7.00 | 0.39 | 7.78 | 0.56 | 6.74 | 0.36 | 6.82 | 0.34 | 6.89 | 0.49 | 6.67 | 0.34 | 6.73 | 0.37 | 6.74 | 0.41 |
| | BIC B | 6.79 | 0.37 | 6.88 | 0.38 | 7.01 | 0.39 | 7.80 | 0.55 | 6.73 | 0.35 | 6.81 | 0.35 | 6.90 | 0.49 | 6.66 | 0.34 | 6.73 | 0.37 | 6.77 | 0.41 |
| | AIC SB | 6.81 | 0.37 | 6.90 | 0.38 | 7.00 | 0.39 | 7.78 | 0.56 | 6.74 | 0.36 | 6.82 | 0.34 | 6.89 | 0.49 | 6.67 | 0.34 | 6.73 | 0.37 | 6.74 | 0.41 |
| | BIC SB | 6.79 | 0.37 | 6.88 | 0.38 | 7.01 | 0.39 | 7.80 | 0.55 | 6.73 | 0.35 | 6.81 | 0.35 | 6.90 | 0.49 | 6.66 | 0.34 | 6.73 | 0.37 | 6.77 | 0.41 |
| | AIC F | 6.81 | 0.37 | 6.90 | 0.38 | 7.00 | 0.39 | 7.78 | 0.56 | 6.74 | 0.36 | 6.81 | 0.34 | 6.88 | 0.49 | 6.67 | 0.34 | 6.73 | 0.37 | 6.74 | 0.41 |
| | BIC F | 6.79 | 0.37 | 6.88 | 0.38 | 7.01 | 0.39 | 7.80 | 0.55 | 6.73 | 0.35 | 6.81 | 0.35 | 6.89 | 0.49 | 6.66 | 0.34 | 6.73 | 0.37 | 6.77 | 0.41 |
| | AIC SF | 6.81 | 0.37 | 6.90 | 0.38 | 7.00 | 0.39 | 7.78 | 0.56 | 6.74 | 0.36 | 6.81 | 0.34 | 6.88 | 0.49 | 6.67 | 0.34 | 6.73 | 0.37 | 6.74 | 0.41 |
| | BIC SF | 6.79 | 0.37 | 6.88 | 0.38 | 7.01 | 0.39 | 7.80 | 0.55 | 6.73 | 0.35 | 6.81 | 0.35 | 6.89 | 0.49 | 6.66 | 0.34 | 6.73 | 0.37 | 6.77 | 0.41 |
| | Ridge | 7.18 | 0.45 | 7.26 | 0.42 | 7.45 | 0.44 | 8.45 | 0.56 | 7.15 | 0.40 | 7.20 | 0.39 | 7.42 | 0.48 | 7.05 | 0.37 | 7.13 | 0.40 | 7.30 | 0.50 |
| | Lasso | 7.12 | 0.45 | 7.19 | 0.39 | 7.32 | 0.42 | 8.19 | 0.50 | 7.10 | 0.39 | 7.11 | 0.38 | 7.24 | 0.44 | 6.99 | 0.37 | 7.03 | 0.41 | 7.12 | 0.48 |
| | E-net | 7.12 | 0.45 | 7.19 | 0.40 | 7.32 | 0.42 | 8.18 | 0.51 | 7.10 | 0.38 | 7.11 | 0.38 | 7.23 | 0.45 | 6.99 | 0.37 | 7.03 | 0.40 | 7.11 | 0.47 |
| | SCAD | 6.80 | 0.37 | 6.90 | 0.39 | 7.00 | 0.39 | 7.79 | 0.55 | 6.74 | 0.36 | 6.81 | 0.35 | 6.89 | 0.49 | 6.67 | 0.34 | 6.73 | 0.37 | 6.75 | 0.41 |
| | MCP | 6.81 | 0.37 | 6.90 | 0.38 | 7.00 | 0.39 | 7.79 | 0.55 | 6.74 | 0.36 | 6.81 | 0.35 | 6.89 | 0.49 | 6.67 | 0.34 | 6.73 | 0.37 | 6.75 | 0.41 |
| | XGBoost | 1.53 | 0.11 | 1.56 | 0.10 | 1.52 | 0.10 | 1.46 | 0.09 | 1.52 | 0.09 | 1.52 | 0.10 | 1.42 | 0.11 | 1.54 | 0.09 | 1.52 | 0.10 | 1.37 | 0.09 |
| | RF | 2.30 | 0.20 | 2.31 | 0.18 | 1.97 | 0.14 | 1.39 | 0.09 | 2.28 | 0.18 | 2.17 | 0.18 | 1.58 | 0.12 | 2.27 | 0.17 | 2.12 | 0.20 | 1.71 | 0.13 |
| | SVM | 4.85 | 0.30 | 4.80 | 0.29 | 4.15 | 0.27 | 2.68 | 0.22 | 4.82 | 0.27 | 4.58 | 0.31 | 3.33 | 0.29 | 4.76 | 0.28 | 4.35 | 0.28 | 3.08 | 0.21 |
| 3 | OLS | 178.48 | 20.29 | 178.54 | 18.40 | 179.81 | 19.81 | 180.63 | 24.23 | 174.55 | 16.46 | 176.55 | 18.29 | 178.48 | 20.84 | 177.10 | 20.22 | 176.41 | 18.58 | 176.12 | 18.98 |
| | AIC B | 178.14 | 20.33 | 178.14 | 18.34 | 179.48 | 19.77 | 180.31 | 24.29 | 174.31 | 16.46 | 176.08 | 18.07 | 178.28 | 20.95 | 176.90 | 20.13 | 176.23 | 18.52 | 175.96 | 18.86 |
| | BIC B | 177.68 | 20.18 | 177.96 | 18.41 | 179.31 | 19.64 | 180.33 | 24.15 | 173.97 | 16.23 | 176.04 | 18.19 | 178.07 | 20.92 | 176.63 | 20.08 | 175.79 | 18.66 | 175.82 | 18.83 |
| | AIC SB | 178.14 | 20.33 | 178.14 | 18.34 | 179.48 | 19.77 | 180.31 | 24.29 | 174.31 | 16.46 | 176.08 | 18.07 | 178.28 | 20.95 | 176.90 | 20.13 | 176.23 | 18.52 | 175.96 | 18.86 |
| | BIC SB | 177.68 | 20.18 | 177.96 | 18.41 | 179.31 | 19.64 | 180.33 | 24.15 | 173.97 | 16.23 | 176.07 | 18.18 | 178.07 | 20.92 | 176.63 | 20.08 | 175.79 | 18.66 | 175.82 | 18.83 |
| | AIC F | 178.14 | 20.33 | 178.14 | 18.34 | 179.45 | 19.77 | 180.28 | 24.28 | 174.29 | 16.46 | 176.02 | 18.09 | 178.19 | 21.00 | 176.90 | 20.13 | 176.21 | 18.51 | 175.89 | 18.87 |
| | BIC F | 177.68 | 20.18 | 177.96 | 18.41 | 179.27 | 19.62 | 180.30 | 24.16 | 173.97 | 16.23 | 176.04 | 18.17 | 178.14 | 20.94 | 176.58 | 20.13 | 175.80 | 18.66 | 175.86 | 18.92 |
| | AIC SF | 178.14 | 20.33 | 178.14 | 18.34 | 179.45 | 19.77 | 180.28 | 24.28 | 174.29 | 16.46 | 176.02 | 18.09 | 178.18 | 21.00 | 176.90 | 20.13 | 176.21 | 18.51 | 175.89 | 18.87 |
| | BIC SF | 177.68 | 20.18 | 177.96 | 18.41 | 179.27 | 19.62 | 180.30 | 24.16 | 173.97 | 16.23 | 176.04 | 18.17 | 178.14 | 20.94 | 176.58 | 20.13 | 175.80 | 18.66 | 175.86 | 18.92 |
| | Ridge | 196.16 | 24.13 | 197.32 | 20.38 | 197.50 | 19.88 | 198.32 | 24.32 | 191.23 | 18.79 | 194.59 | 20.98 | 195.82 | 22.71 | 195.70 | 23.53 | 195.42 | 21.44 | 193.11 | 20.32 |
| | Lasso | 194.60 | 23.36 | 195.30 | 19.67 | 195.66 | 20.49 | 196.07 | 24.79 | 189.92 | 18.94 | 192.95 | 21.34 | 193.37 | 22.98 | 194.33 | 23.24 | 193.45 | 21.14 | 191.25 | 20.97 |
| | E-net | 194.69 | 23.36 | 195.41 | 19.89 | 195.78 | 20.46 | 196.08 | 24.77 | 189.92 | 19.01 | 192.92 | 21.52 | 193.44 | 23.21 | 194.55 | 23.47 | 193.55 | 21.00 | 191.24 | 21.06 |
| | SCAD | 177.99 | 20.40 | 178.20 | 18.48 | 179.53 | 19.76 | 180.55 | 24.22 | 174.13 | 16.40 | 176.36 | 18.27 | 178.28 | 21.06 | 176.90 | 20.21 | 176.11 | 18.65 | 175.99 | 18.79 |
| | MCP | 177.96 | 20.36 | 178.18 | 18.45 | 179.57 | 19.68 | 180.54 | 24.17 | 174.21 | 16.39 | 176.40 | 18.23 | 178.19 | 20.95 | 176.89 | 20.09 | 176.10 | 18.66 | 175.89 | 18.92 |
| | XGBoost | 13.05 | 2.10 | 13.10 | 1.90 | 13.70 | 2.81 | 14.70 | 3.27 | 13.34 | 3.15 | 13.32 | 2.24 | 14.15 | 3.17 | 13.45 | 2.44 | 13.40 | 2.71 | 13.65 | 2.58 |
| | RF | 29.47 | 6.43 | 28.71 | 5.42 | 25.53 | 4.89 | 17.01 | 3.12 | 29.24 | 6.49 | 28.60 | 5.49 | 20.53 | 4.54 | 29.78 | 5.82 | 28.29 | 5.40 | 22.58 | 4.06 |
| | SVM | 38.91 | 6.45 | 35.72 | 5.34 | 27.90 | 5.80 | 16.96 | 5.58 | 37.17 | 5.73 | 32.70 | 5.64 | 20.67 | 6.44 | 37.10 | 6.22 | 30.70 | 5.50 | 20.45 | 5.23 |
| 6 | OLS | 2685.11 | 321.65 | 2681.03 | 290.53 | 2693.97 | 315.60 | 2688.88 | 380.44 | 2627.28 | 264.68 | 2657.71 | 290.75 | 2681.07 | 329.88 | 2669.62 | 319.31 | 2653.24 | 297.06 | 2655.97 | 301.03 |
| | AIC B | 2680.84 | 321.36 | 2676.94 | 290.66 | 2689.45 | 316.70 | 2680.40 | 379.80 | 2623.09 | 265.06 | 2652.12 | 288.61 | 2674.36 | 330.21 | 2668.99 | 319.28 | 2649.50 | 296.26 | 2651.86 | 299.83 |
| | BIC B | 2673.93 | 321.96 | 2672.07 | 287.70 | 2683.69 | 315.27 | 2669.74 | 377.79 | 2614.05 | 263.04 | 2644.55 | 289.57 | 2668.42 | 332.51 | 2662.65 | 315.24 | 2640.90 | 295.29 | 2646.33 | 302.84 |
| | AIC SB | 2680.84 | 321.36 | 2676.94 | 290.66 | 2689.45 | 316.70 | 2680.40 | 379.80 | 2623.09 | 265.06 | 2652.12 | 288.61 | 2674.36 | 330.21 | 2668.99 | 319.28 | 2649.50 | 296.26 | 2651.86 | 299.83 |
| | BIC SB | 2673.93 | 321.96 | 2672.07 | 287.70 | 2683.69 | 315.27 | 2669.74 | 377.79 | 2614.05 | 263.04 | 2644.55 | 289.57 | 2668.42 | 332.51 | 2662.65 | 315.24 | 2640.90 | 295.29 | 2646.33 | 302.84 |
| | AIC F | 2680.75 | 321.34 | 2676.10 | 289.96 | 2688.15 | 316.80 | 2677.23 | 380.46 | 2623.04 | 265.04 | 2651.29 | 288.27 | 2671.46 | 329.52 | 2668.55 | 319.03 | 2648.43 | 296.54 | 2650.86 | 300.73 |
| | BIC F | 2673.34 | 322.12 | 2672.07 | 287.70 | 2683.29 | 315.45 | 2669.74 | 377.79 | 2613.70 | 263.20 | 2644.30 | 289.69 | 2667.58 | 332.92 | 2662.65 | 315.24 | 2640.48 | 295.07 | 2646.63 | 303.15 |
| | AIC SF | 2680.75 | 321.34 | 2676.10 | 289.96 | 2688.15 | 316.80 | 2677.23 | 380.46 | 2623.04 | 265.04 | 2651.29 | 288.27 | 2671.47 | 329.52 | 2668.55 | 319.03 | 2648.43 | 296.54 | 2650.86 | 300.73 |
| | BIC SF | 2673.34 | 322.12 | 2672.07 | 287.70 | 2683.29 | 315.45 | 2669.74 | 377.79 | 2613.70 | 263.20 | 2644.30 | 289.69 | 2667.62 | 332.91 | 2662.65 | 315.24 | 2640.48 | 295.07 | 2646.63 | 303.15 |
| | Ridge | 2929.29 | 349.67 | 2942.89 | 291.69 | 2967.01 | 317.15 | 2952.16 | 386.78 | 2864.22 | 281.97 | 2929.88 | 319.63 | 2945.32 | 368.81 | 2920.99 | 349.24 | 2913.64 | 311.21 | 2891.17 | 309.37 |
| | Lasso | 2909.34 | 355.91 | 2919.02 | 298.62 | 2930.73 | 322.98 | 2916.61 | 393.04 | 2840.92 | 287.29 | 2895.79 | 320.95 | 2913.09 | 373.81 | 2899.60 | 351.35 | 2890.65 | 310.92 | 2869.77 | 309.43 |
| | E-net | 2910.20 | 355.59 | 2920.01 | 297.80 | 2933.67 | 324.17 | 2920.77 | 392.48 | 2840.37 | 288.24 | 2896.64 | 321.23 | 2913.46 | 373.45 | 2903.22 | 350.73 | 2889.01 | 311.64 | 2869.83 | 308.88 |
| | SCAD | 2669.74 | 319.97 | 2669.98 | 285.50 | 2683.54 | 315.75 | 2674.54 | 378.27 | 2613.28 | 265.59 | 2641.88 | 285.33 | 2669.37 | 331.78 | 2662.47 | 315.87 | 2642.64 | 295.73 | 2649.47 | 301.39 |
| | MCP | 2670.54 | 321.23 | 2670.15 | 286.41 | 2684.56 | 316.55 | 2675.12 | 379.17 | 2613.90 | 264.16 | 2643.99 | 286.19 | 2671.26 | 331.36 | 2664.08 | 317.07 | 2646.06 | 293.95 | 2649.71 | 300.31 |
| | XGBoost | 71.61 | 30.49 | 72.48 | 25.89 | 78.96 | 39.04 | 88.96 | 45.11 | 74.60 | 44.15 | 74.58 | 32.46 | 86.77 | 44.52 | 77.80 | 36.14 | 76.24 | 40.18 | 84.65 | 39.51 |
| | RF | 230.96 | 87.62 | 223.44 | 69.22 | 208.00 | 74.51 | 128.85 | 48.22 | 227.64 | 87.04 | 221.12 | 73.08 | 148.76 | 62.59 | 233.35 | 77.15 | 222.54 | 74.22 | 152.12 | 47.85 |
| | SVM | 412.21 | 101.23 | 364.13 | 84.15 | 257.55 | 89.05 | 132.26 | 83.16 | 386.81 | 87.26 | 317.43 | 85.82 | 171.73 | 90.10 | 385.23 | 91.51 | 295.24 | 83.96 | 171.48 | 79.94 |

Table 53: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 1000$ and $p = 100$. See Figure 53 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 7.47 | 0.34 | 7.53 | 0.43 | 7.73 | 0.45 | 8.62 | 0.56 | 7.43 | 0.40 | 7.43 | 0.41 | 7.58 | 0.51 | 7.49 | 0.40 | 7.74 | 0.45 | 8.59 | 0.49 |
| | AIC F | 7.17 | 0.33 | 7.23 | 0.40 | 7.41 | 0.45 | 8.29 | 0.54 | 7.11 | 0.40 | 7.09 | 0.38 | 7.09 | 0.47 | 7.18 | 0.39 | 7.39 | 0.44 | 8.02 | 0.46 |
| | BIC F | 6.84 | 0.31 | 6.89 | 0.37 | 7.08 | 0.43 | 7.93 | 0.49 | 6.78 | 0.35 | 6.77 | 0.34 | 6.94 | 0.45 | 6.83 | 0.37 | 7.08 | 0.40 | 7.83 | 0.44 |
| | AIC SF | 7.17 | 0.33 | 7.23 | 0.40 | 7.41 | 0.44 | 8.29 | 0.54 | 7.12 | 0.40 | 7.08 | 0.38 | 7.09 | 0.48 | 7.18 | 0.39 | 7.39 | 0.44 | 8.02 | 0.46 |
| | BIC SF | 6.84 | 0.31 | 6.89 | 0.37 | 7.08 | 0.43 | 7.93 | 0.49 | 6.78 | 0.35 | 6.77 | 0.34 | 6.94 | 0.45 | 6.83 | 0.37 | 7.08 | 0.40 | 7.83 | 0.44 |
| | Ridge | 7.80 | 0.39 | 7.87 | 0.43 | 8.06 | 0.50 | 8.87 | 0.54 | 7.74 | 0.43 | 7.70 | 0.40 | 7.78 | 0.46 | 7.81 | 0.44 | 8.11 | 0.48 | 8.81 | 0.49 |
| | Lasso | 7.22 | 0.37 | 7.22 | 0.38 | 7.39 | 0.46 | 8.24 | 0.46 | 7.12 | 0.38 | 7.07 | 0.36 | 7.25 | 0.43 | 7.18 | 0.40 | 7.38 | 0.39 | 8.21 | 0.45 |
| | E-net | 7.23 | 0.37 | 7.23 | 0.38 | 7.40 | 0.45 | 8.25 | 0.45 | 7.13 | 0.39 | 7.07 | 0.35 | 7.26 | 0.43 | 7.18 | 0.40 | 7.39 | 0.40 | 8.21 | 0.45 |
| | SCAD | 6.84 | 0.32 | 6.89 | 0.37 | 7.07 | 0.41 | 7.94 | 0.49 | 6.78 | 0.35 | 6.79 | 0.34 | 6.95 | 0.46 | 6.84 | 0.37 | 7.09 | 0.39 | 7.85 | 0.43 |
| | MCP | 6.84 | 0.32 | 6.89 | 0.37 | 7.07 | 0.42 | 7.93 | 0.49 | 6.77 | 0.35 | 6.78 | 0.34 | 6.96 | 0.46 | 6.83 | 0.37 | 7.08 | 0.39 | 7.85 | 0.43 |
| | XGBoost | 1.65 | 0.10 | 1.65 | 0.10 | 1.64 | 0.13 | 1.50 | 0.09 | 1.66 | 0.10 | 1.60 | 0.10 | 1.53 | 0.09 | 1.65 | 0.10 | 1.62 | 0.10 | 1.50 | 0.10 |
| | RF | 3.09 | 0.23 | 3.14 | 0.26 | 2.58 | 0.21 | 1.64 | 0.10 | 3.06 | 0.27 | 2.68 | 0.24 | 1.79 | 0.13 | 3.00 | 0.27 | 2.44 | 0.17 | 1.57 | 0.12 |
| | SVM | 7.96 | 0.35 | 7.63 | 0.40 | 6.18 | 0.33 | 3.56 | 0.26 | 7.97 | 0.41 | 7.95 | 0.36 | 7.05 | 0.34 | 7.96 | 0.39 | 7.30 | 0.42 | 5.08 | 0.31 |
| 3 | OLS | 198.84 | 20.51 | 194.18 | 17.64 | 196.61 | 18.99 | 201.64 | 19.56 | 192.88 | 20.04 | 194.18 | 21.06 | 195.45 | 20.50 | 194.48 | 18.21 | 197.29 | 21.14 | 200.29 | 19.38 |
| | AIC F | 190.68 | 20.09 | 186.28 | 17.57 | 188.16 | 18.92 | 192.87 | 19.76 | 184.34 | 20.05 | 185.23 | 20.54 | 182.78 | 20.12 | 186.48 | 17.77 | 188.00 | 20.78 | 187.16 | 18.75 |
| | BIC F | 181.93 | 19.98 | 178.03 | 18.19 | 179.52 | 19.25 | 184.62 | 19.12 | 175.60 | 20.12 | 178.02 | 20.72 | 178.02 | 19.72 | 177.96 | 18.17 | 179.54 | 20.65 | 182.36 | 18.61 |
| | AIC SF | 190.68 | 20.08 | 186.27 | 17.57 | 188.19 | 18.90 | 192.87 | 19.77 | 184.36 | 20.02 | 185.24 | 20.52 | 182.71 | 20.11 | 186.46 | 17.78 | 188.01 | 20.81 | 187.18 | 18.78 |
| | BIC SF | 181.93 | 19.98 | 178.03 | 18.19 | 179.56 | 19.30 | 184.62 | 19.12 | 175.60 | 20.12 | 178.02 | 20.72 | 178.02 | 19.72 | 177.96 | 18.17 | 179.54 | 20.65 | 182.36 | 18.61 |
| | Ridge | 213.07 | 22.18 | 209.45 | 21.25 | 209.58 | 21.46 | 205.13 | 24.08 | 207.25 | 22.26 | 208.19 | 23.89 | 201.54 | 21.18 | 208.38 | 21.07 | 210.38 | 22.20 | 205.66 | 23.11 |
| | Lasso | 197.97 | 21.81 | 193.68 | 20.48 | 195.44 | 21.44 | 199.87 | 23.85 | 191.33 | 21.59 | 194.22 | 22.64 | 193.17 | 21.26 | 193.83 | 20.93 | 196.42 | 22.21 | 199.16 | 23.05 |
| | E-net | 198.26 | 22.03 | 193.70 | 20.60 | 195.55 | 21.51 | 199.91 | 23.74 | 191.64 | 21.62 | 194.20 | 22.50 | 193.34 | 21.04 | 193.85 | 20.88 | 196.24 | 22.25 | 199.44 | 22.53 |
| | SCAD | 181.27 | 20.01 | 177.24 | 18.22 | 178.84 | 18.71 | 184.75 | 19.29 | 174.89 | 20.32 | 177.65 | 20.59 | 177.89 | 19.26 | 177.52 | 18.13 | 179.61 | 20.48 | 182.82 | 18.76 |
| | MCP | 181.32 | 20.18 | 177.14 | 18.25 | 179.04 | 18.79 | 184.83 | 19.27 | 174.84 | 20.38 | 177.51 | 20.54 | 177.73 | 19.24 | 177.47 | 18.17 | 179.55 | 20.59 | 182.82 | 18.78 |
| | XGBoost | 14.91 | 3.43 | 14.80 | 2.64 | 15.31 | 4.54 | 15.38 | 2.18 | 14.72 | 3.97 | 14.22 | 1.86 | 15.28 | 2.28 | 14.67 | 2.27 | 14.84 | 2.69 | 15.50 | 3.07 |
| | RF | 38.88 | 8.14 | 39.06 | 6.42 | 33.83 | 5.89 | 20.68 | 2.51 | 38.60 | 8.69 | 38.04 | 7.40 | 25.28 | 4.06 | 38.20 | 6.91 | 33.63 | 6.75 | 20.60 | 4.03 |
| | SVM | 177.79 | 18.16 | 145.73 | 13.86 | 89.10 | 9.66 | 29.64 | 5.28 | 170.62 | 18.34 | 159.42 | 17.28 | 82.52 | 8.27 | 159.31 | 14.50 | 115.75 | 13.55 | 48.72 | 9.10 |
| 6 | OLS | 3001.96 | 331.02 | 2917.31 | 278.66 | 2937.05 | 299.07 | 3001.71 | 302.04 | 2908.75 | 311.25 | 2925.03 | 331.58 | 2933.41 | 323.00 | 2929.74 | 288.37 | 2957.87 | 334.09 | 2985.81 | 306.22 |
| | AIC F | 2882.15 | 322.73 | 2798.02 | 279.84 | 2813.85 | 297.74 | 2869.11 | 306.51 | 2777.91 | 310.54 | 2791.26 | 319.97 | 2736.07 | 313.77 | 2809.60 | 287.67 | 2817.87 | 334.74 | 2781.75 | 294.07 |
| | BIC F | 2741.65 | 328.84 | 2676.45 | 283.05 | 2675.13 | 298.38 | 2742.98 | 301.20 | 2642.88 | 312.36 | 2672.34 | 327.50 | 2659.18 | 313.44 | 2681.58 | 291.04 | 2691.27 | 327.32 | 2706.40 | 294.35 |
| | AIC SF | 2881.26 | 322.53 | 2798.13 | 279.99 | 2813.50 | 297.49 | 2869.16 | 306.34 | 2777.65 | 310.27 | 2791.29 | 319.99 | 2735.92 | 312.09 | 2809.30 | 287.09 | 2817.92 | 334.30 | 2781.93 | 294.26 |
| | BIC SF | 2741.65 | 328.84 | 2676.45 | 283.05 | 2675.13 | 298.38 | 2742.98 | 301.20 | 2642.88 | 312.36 | 2672.34 | 327.50 | 2659.63 | 313.67 | 2681.58 | 291.04 | 2691.27 | 327.32 | 2706.51 | 294.35 |
| | Ridge | 3014.13 | 315.25 | 2974.47 | 288.42 | 3002.52 | 324.26 | 3003.64 | 367.68 | 2941.99 | 320.14 | 3002.37 | 336.82 | 2970.68 | 334.82 | 2984.44 | 302.81 | 3030.94 | 347.15 | 3029.35 | 369.20 |
| | Lasso | 2948.02 | 340.05 | 2880.77 | 301.12 | 2919.80 | 336.71 | 2980.10 | 371.61 | 2862.33 | 323.79 | 2902.47 | 348.98 | 2897.17 | 338.67 | 2903.12 | 314.76 | 2945.14 | 347.24 | 2980.34 | 367.59 |
| | E-net | 2948.68 | 341.05 | 2881.58 | 301.38 | 2923.27 | 336.16 | 2982.00 | 371.96 | 2865.23 | 323.36 | 2905.05 | 348.92 | 2900.42 | 338.45 | 2904.62 | 314.65 | 2945.49 | 348.99 | 2981.52 | 366.49 |
| | SCAD | 2715.42 | 320.52 | 2650.57 | 286.40 | 2657.41 | 294.00 | 2739.77 | 301.19 | 2616.41 | 313.87 | 2654.97 | 326.98 | 2648.89 | 311.63 | 2657.96 | 288.24 | 2677.46 | 323.74 | 2706.97 | 299.01 |
| | MCP | 2717.49 | 320.67 | 2651.74 | 286.47 | 2664.17 | 297.22 | 2736.35 | 301.80 | 2618.05 | 314.26 | 2655.17 | 328.15 | 2651.73 | 311.48 | 2658.32 | 286.46 | 2678.35 | 324.37 | 2705.90 | 293.68 |
| | XGBoost | 86.76 | 50.53 | 81.76 | 35.39 | 91.07 | 78.31 | 86.49 | 30.68 | 83.74 | 59.81 | 76.51 | 24.18 | 93.31 | 35.71 | 81.76 | 29.35 | 83.54 | 36.71 | 89.46 | 37.10 |
| | RF | 306.17 | 105.81 | 298.50 | 78.07 | 271.23 | 82.44 | 162.33 | 37.69 | 290.58 | 108.90 | 285.74 | 87.24 | 192.32 | 57.14 | 298.37 | 86.95 | 277.48 | 92.79 | 165.87 | 55.72 |
| | SVM | 2601.43 | 295.17 | 2079.75 | 218.16 | 1213.69 | 149.53 | 307.80 | 77.48 | 2486.14 | 286.19 | 2301.70 | 272.27 | 1078.37 | 131.64 | 2300.82 | 232.77 | 1605.57 | 205.31 | 560.56 | 119.93 |

Table 54: Mean and standard deviation of the testing MSE for the non-linear simulations when $n = 1000$ and $p = 2000$. See Figure 54 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 20.36 | 0.93 | 18.03 | 0.93 | 14.40 | 0.63 | 9.68 | 0.48 | 20.99 | 0.96 | 21.64 | 0.94 | 20.43 | 0.93 | 18.65 | 0.73 | 14.89 | 0.68 | 10.02 | 0.59 |
| | Lasso | 7.36 | 0.46 | 7.33 | 0.43 | 7.56 | 0.43 | 8.35 | 0.47 | 7.28 | 0.40 | 7.25 | 0.40 | 7.29 | 0.49 | 7.32 | 0.41 | 7.48 | 0.46 | 8.22 | 0.56 |
| | E-net | 7.38 | 0.47 | 7.35 | 0.43 | 7.58 | 0.43 | 8.38 | 0.47 | 7.30 | 0.40 | 7.27 | 0.40 | 7.30 | 0.49 | 7.33 | 0.42 | 7.49 | 0.46 | 8.24 | 0.56 |
| | SCAD | 6.90 | 0.40 | 6.91 | 0.37 | 7.21 | 0.38 | 7.90 | 0.43 | 6.90 | 0.35 | 6.89 | 0.36 | 7.01 | 0.44 | 6.95 | 0.36 | 7.15 | 0.41 | 7.81 | 0.50 |
| | MCP | 6.86 | 0.41 | 6.88 | 0.38 | 7.18 | 0.39 | 7.90 | 0.43 | 6.86 | 0.35 | 6.87 | 0.36 | 7.01 | 0.44 | 6.92 | 0.36 | 7.12 | 0.41 | 7.81 | 0.50 |
| | XGBoost | 1.79 | 0.12 | 1.79 | 0.10 | 1.78 | 0.12 | 1.63 | 0.12 | 1.77 | 0.12 | 1.75 | 0.11 | 1.68 | 0.13 | 1.75 | 0.10 | 1.73 | 0.11 | 1.58 | 0.12 |
| | RF | 3.92 | 0.31 | 4.02 | 0.28 | 3.23 | 0.24 | 1.94 | 0.12 | 3.83 | 0.29 | 3.38 | 0.30 | 2.15 | 0.20 | 3.76 | 0.25 | 2.96 | 0.21 | 1.76 | 0.12 |
| | SVM | 19.17 | 0.87 | 16.67 | 0.75 | 12.19 | 0.53 | 5.00 | 0.32 | 19.68 | 0.91 | 19.90 | 0.84 | 16.64 | 0.77 | 17.40 | 0.71 | 14.04 | 0.57 | 9.69 | 0.47 |
| 3 | Ridge | 262.79 | 20.16 | 254.60 | 26.44 | 230.35 | 22.21 | 193.27 | 17.93 | 268.52 | 17.45 | 279.27 | 22.67 | 259.77 | 28.21 | 264.95 | 24.30 | 242.97 | 24.75 | 205.95 | 21.21 |
| | Lasso | 195.12 | 20.76 | 196.78 | 24.76 | 197.11 | 22.65 | 192.88 | 19.57 | 194.50 | 18.99 | 198.77 | 22.75 | 197.95 | 25.93 | 198.46 | 22.69 | 198.83 | 24.35 | 194.74 | 20.87 |
| | E-net | 195.58 | 20.82 | 197.07 | 24.72 | 197.36 | 22.76 | 193.34 | 19.36 | 194.94 | 18.93 | 199.18 | 22.77 | 198.12 | 25.70 | 198.83 | 22.69 | 199.11 | 24.35 | 195.08 | 20.89 |
| | SCAD | 177.52 | 19.61 | 178.19 | 21.93 | 180.45 | 19.98 | 178.29 | 16.87 | 178.67 | 18.04 | 178.78 | 19.86 | 181.72 | 21.66 | 180.60 | 21.88 | 181.23 | 21.83 | 179.58 | 17.03 |
| | MCP | 176.92 | 19.45 | 177.75 | 22.05 | 180.62 | 20.05 | 178.51 | 16.79 | 178.14 | 18.17 | 178.27 | 19.98 | 181.27 | 21.68 | 179.92 | 21.93 | 180.95 | 21.78 | 179.55 | 17.02 |
| | XGBoost | 16.37 | 2.98 | 16.38 | 3.08 | 17.09 | 2.95 | 17.22 | 2.62 | 15.97 | 2.78 | 17.00 | 3.31 | 17.93 | 5.01 | 16.48 | 3.96 | 16.97 | 4.19 | 16.80 | 3.07 |
| | RF | 48.74 | 9.86 | 49.26 | 9.32 | 44.66 | 6.51 | 24.93 | 3.44 | 48.95 | 8.81 | 50.58 | 9.66 | 33.65 | 7.26 | 49.17 | 10.40 | 42.34 | 8.58 | 23.72 | 4.81 |
| | SVM | 250.15 | 20.77 | 228.13 | 21.70 | 170.84 | 14.35 | 51.33 | 6.19 | 252.93 | 17.13 | 255.33 | 20.94 | 234.28 | 24.67 | 241.43 | 22.45 | 207.29 | 20.19 | 98.84 | 9.51 |
| 6 | Ridge | 2952.93 | 300.31 | 2998.70 | 363.51 | 2965.62 | 367.96 | 2728.49 | 311.34 | 2978.69 | 262.96 | 3055.14 | 317.69 | 3178.68 | 386.24 | 3044.21 | 346.35 | 3081.63 | 353.46 | 2955.37 | 338.43 |
| | Lasso | 2880.77 | 307.03 | 2901.67 | 369.63 | 2930.25 | 355.82 | 2850.12 | 310.41 | 2878.86 | 275.61 | 2948.24 | 348.21 | 2964.82 | 406.83 | 2940.29 | 341.10 | 2953.77 | 372.17 | 2893.53 | 337.77 |
| | E-net | 2882.67 | 307.02 | 2904.65 | 369.02 | 2931.91 | 355.19 | 2853.14 | 310.79 | 2882.34 | 275.12 | 2951.51 | 348.55 | 2966.70 | 405.33 | 2942.82 | 341.73 | 2957.61 | 370.63 | 2896.08 | 336.92 |
| | SCAD | 2637.34 | 304.57 | 2643.80 | 351.02 | 2663.38 | 313.00 | 2631.89 | 264.31 | 2651.19 | 276.21 | 2658.69 | 313.58 | 2692.91 | 343.54 | 2683.60 | 345.53 | 2677.31 | 347.32 | 2638.15 | 276.77 |
| | MCP | 2635.39 | 303.10 | 2644.36 | 350.02 | 2665.88 | 313.43 | 2640.00 | 268.58 | 2648.63 | 277.54 | 2657.11 | 312.85 | 2697.34 | 343.94 | 2681.20 | 346.18 | 2676.51 | 347.17 | 2639.24 | 276.32 |
| | XGBoost | 91.99 | 36.47 | 89.95 | 37.57 | 95.22 | 38.79 | 90.70 | 29.18 | 88.05 | 40.05 | 103.18 | 48.16 | 109.84 | 70.38 | 93.38 | 54.03 | 98.81 | 55.42 | 95.99 | 35.67 |
| | RF | 371.61 | 121.81 | 367.47 | 120.90 | 361.20 | 89.39 | 198.64 | 46.92 | 367.37 | 105.97 | 390.42 | 117.24 | 274.09 | 97.04 | 374.79 | 133.72 | 351.17 | 118.05 | 197.82 | 65.85 |
| | SVM | 2935.73 | 304.45 | 2773.80 | 333.73 | 2134.83 | 223.66 | 582.15 | 82.33 | 2953.28 | 264.04 | 2993.89 | 314.79 | 2947.32 | 364.92 | 2935.84 | 347.39 | 2629.77 | 324.09 | 1213.28 | 140.09 |

## 5.3 Tables for the $\beta$-sensitivity of the non-linear simulations

Table 55: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 50$ and $p = 10$. See Figure 55 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.4517 | 0.1729 | 0.4350 | 0.1673 | 0.4150 | 0.1749 | 0.3417 | 0.1731 | 0.4167 | 0.1598 | 0.4317 | 0.1677 | 0.4117 | 0.1946 | 0.4583 | 0.1915 | 0.4300 | 0.1678 | 0.3933 | 0.1812 |
| | BIC B | 0.3217 | 0.1540 | 0.3067 | 0.1396 | 0.3000 | 0.1361 | 0.2167 | 0.1219 | 0.3017 | 0.1415 | 0.2917 | 0.1369 | 0.2933 | 0.1556 | 0.3000 | 0.1231 | 0.3033 | 0.1348 | 0.2433 | 0.1328 |
| | AIC SB | 0.4517 | 0.1729 | 0.4350 | 0.1673 | 0.4150 | 0.1749 | 0.3433 | 0.1738 | 0.4167 | 0.1598 | 0.4317 | 0.1677 | 0.4150 | 0.1932 | 0.4583 | 0.1915 | 0.4300 | 0.1678 | 0.3950 | 0.1799 |
| | BIC SB | 0.3217 | 0.1540 | 0.3050 | 0.1403 | 0.3017 | 0.1355 | 0.2183 | 0.1224 | 0.3017 | 0.1415 | 0.2917 | 0.1369 | 0.2933 | 0.1556 | 0.3000 | 0.1231 | 0.3033 | 0.1348 | 0.2433 | 0.1328 |
| | AIC F | 0.4450 | 0.1693 | 0.4067 | 0.1559 | 0.3983 | 0.1690 | 0.2917 | 0.1524 | 0.4100 | 0.1631 | 0.3900 | 0.1593 | 0.3250 | 0.1613 | 0.4317 | 0.1726 | 0.3967 | 0.1620 | 0.3517 | 0.1639 |
| | BIC F | 0.3117 | 0.1434 | 0.2800 | 0.1273 | 0.2850 | 0.1191 | 0.2000 | 0.1086 | 0.2900 | 0.1374 | 0.2683 | 0.1182 | 0.2333 | 0.0948 | 0.2833 | 0.1124 | 0.2900 | 0.1267 | 0.2333 | 0.1005 |
| | AIC SF | 0.4433 | 0.1679 | 0.4067 | 0.1559 | 0.3967 | 0.1671 | 0.2900 | 0.1472 | 0.4083 | 0.1596 | 0.3867 | 0.1569 | 0.3150 | 0.1551 | 0.4317 | 0.1726 | 0.3950 | 0.1601 | 0.3417 | 0.1648 |
| | BIC SF | 0.3117 | 0.1434 | 0.2800 | 0.1273 | 0.2850 | 0.1191 | 0.1983 | 0.1078 | 0.2900 | 0.1374 | 0.2683 | 0.1182 | 0.2267 | 0.0933 | 0.2833 | 0.1124 | 0.2900 | 0.1267 | 0.2067 | 0.0951 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.3033 | 0.1779 | 0.3317 | 0.1858 | 0.4100 | 0.1945 | 0.3767 | 0.1652 | 0.3033 | 0.1825 | 0.3583 | 0.1648 | 0.4150 | 0.1580 | 0.3367 | 0.1953 | 0.3733 | 0.1897 | 0.4000 | 0.1708 |
| | E-net | 0.3150 | 0.1849 | 0.3550 | 0.1919 | 0.4450 | 0.2025 | 0.5117 | 0.1777 | 0.3333 | 0.1895 | 0.3883 | 0.1725 | 0.5233 | 0.1725 | 0.3600 | 0.1978 | 0.4233 | 0.1795 | 0.5000 | 0.1725 |
| | SCAD | 0.4100 | 0.2362 | 0.3983 | 0.2208 | 0.4267 | 0.2620 | 0.2617 | 0.2014 | 0.4033 | 0.2250 | 0.3667 | 0.2235 | 0.3133 | 0.2226 | 0.4250 | 0.2599 | 0.3483 | 0.1955 | 0.3533 | 0.2532 |
| | MCP | 0.3667 | 0.2333 | 0.3133 | 0.2109 | 0.3567 | 0.2563 | 0.2517 | 0.2125 | 0.3400 | 0.2308 | 0.3067 | 0.1964 | 0.3083 | 0.2420 | 0.3567 | 0.2649 | 0.2867 | 0.1881 | 0.3150 | 0.2438 |
| 3 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.4150 | 0.1873 | 0.4100 | 0.1748 | 0.4267 | 0.1825 | 0.3750 | 0.1698 | 0.3750 | 0.1665 | 0.3950 | 0.1652 | 0.3517 | 0.1879 | 0.3917 | 0.1681 | 0.4050 | 0.1540 | 0.3650 | 0.1653 |
| | BIC B | 0.2800 | 0.1273 | 0.2833 | 0.1489 | 0.2967 | 0.1433 | 0.2283 | 0.1312 | 0.2600 | 0.1068 | 0.2750 | 0.1429 | 0.2417 | 0.1348 | 0.2767 | 0.1190 | 0.2967 | 0.1331 | 0.2550 | 0.1350 |
| | AIC SB | 0.4150 | 0.1873 | 0.4100 | 0.1748 | 0.4267 | 0.1825 | 0.3767 | 0.1685 | 0.3750 | 0.1665 | 0.3950 | 0.1652 | 0.3517 | 0.1879 | 0.3917 | 0.1681 | 0.4083 | 0.1542 | 0.3667 | 0.1658 |
| | BIC SB | 0.2800 | 0.1273 | 0.2833 | 0.1489 | 0.2967 | 0.1433 | 0.2283 | 0.1312 | 0.2617 | 0.1039 | 0.2750 | 0.1429 | 0.2400 | 0.1347 | 0.2783 | 0.1162 | 0.2967 | 0.1331 | 0.2550 | 0.1350 |
| | AIC F | 0.3933 | 0.1733 | 0.3850 | 0.1736 | 0.3833 | 0.1781 | 0.3050 | 0.1625 | 0.3450 | 0.1484 | 0.3517 | 0.1533 | 0.2800 | 0.1379 | 0.3667 | 0.1553 | 0.3717 | 0.1496 | 0.3017 | 0.1511 |
| | BIC F | 0.2683 | 0.1158 | 0.2667 | 0.1361 | 0.2600 | 0.1215 | 0.1783 | 0.1066 | 0.2567 | 0.1017 | 0.2467 | 0.0990 | 0.1950 | 0.1186 | 0.2650 | 0.1138 | 0.2667 | 0.1161 | 0.2100 | 0.1076 |
| | AIC SF | 0.3933 | 0.1733 | 0.3850 | 0.1736 | 0.3833 | 0.1781 | 0.3033 | 0.1596 | 0.3450 | 0.1484 | 0.3517 | 0.1533 | 0.2700 | 0.1377 | 0.3667 | 0.1553 | 0.3700 | 0.1490 | 0.2933 | 0.1384 |
| | BIC SF | 0.2683 | 0.1158 | 0.2667 | 0.1361 | 0.2600 | 0.1215 | 0.1767 | 0.1055 | 0.2567 | 0.1017 | 0.2467 | 0.0990 | 0.1883 | 0.1128 | 0.2650 | 0.1138 | 0.2667 | 0.1161 | 0.2083 | 0.1043 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1550 | 0.1729 | 0.1300 | 0.1331 | 0.2117 | 0.1689 | 0.2683 | 0.1952 | 0.1183 | 0.1067 | 0.1300 | 0.1075 | 0.2133 | 0.1790 | 0.1317 | 0.1504 | 0.1517 | 0.1626 | 0.1917 | 0.1505 |
| | E-net | 0.1567 | 0.1786 | 0.1350 | 0.1415 | 0.2283 | 0.1875 | 0.3500 | 0.2327 | 0.1167 | 0.1073 | 0.1333 | 0.1111 | 0.2833 | 0.2291 | 0.1350 | 0.1566 | 0.1633 | 0.1708 | 0.2467 | 0.1842 |
| | SCAD | 0.3983 | 0.2550 | 0.3867 | 0.2391 | 0.3933 | 0.2351 | 0.2917 | 0.2577 | 0.3233 | 0.2103 | 0.3250 | 0.2373 | 0.2617 | 0.2238 | 0.3317 | 0.2017 | 0.4167 | 0.2524 | 0.2917 | 0.2214 |
| | MCP | 0.3533 | 0.2419 | 0.3333 | 0.2540 | 0.3533 | 0.2565 | 0.2783 | 0.2649 | 0.2783 | 0.2079 | 0.2817 | 0.2218 | 0.2483 | 0.2501 | 0.2950 | 0.1951 | 0.3500 | 0.2600 | 0.2617 | 0.2109 |
| 6 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.3900 | 0.1792 | 0.3733 | 0.1852 | 0.3800 | 0.1969 | 0.3500 | 0.1633 | 0.3433 | 0.1705 | 0.3583 | 0.1794 | 0.3150 | 0.1995 | 0.3750 | 0.1731 | 0.3750 | 0.1681 | 0.3450 | 0.1854 |
| | BIC B | 0.2433 | 0.1525 | 0.2317 | 0.1690 | 0.2450 | 0.1544 | 0.1900 | 0.1441 | 0.2200 | 0.1419 | 0.2217 | 0.1320 | 0.1933 | 0.1548 | 0.2267 | 0.1287 | 0.2417 | 0.1306 | 0.2083 | 0.1369 |
| | AIC SB | 0.3933 | 0.1797 | 0.3733 | 0.1852 | 0.3783 | 0.1994 | 0.3500 | 0.1633 | 0.3467 | 0.1686 | 0.3617 | 0.1758 | 0.3150 | 0.1995 | 0.3767 | 0.1702 | 0.3750 | 0.1681 | 0.3450 | 0.1854 |
| | BIC SB | 0.2433 | 0.1525 | 0.2317 | 0.1690 | 0.2450 | 0.1544 | 0.1917 | 0.1448 | 0.2217 | 0.1403 | 0.2233 | 0.1302 | 0.1950 | 0.1554 | 0.2300 | 0.1293 | 0.2433 | 0.1285 | 0.2083 | 0.1369 |
| | AIC F | 0.3617 | 0.1693 | 0.3333 | 0.1820 | 0.3183 | 0.1742 | 0.2500 | 0.1667 | 0.3233 | 0.1532 | 0.3183 | 0.1519 | 0.2083 | 0.1747 | 0.3417 | 0.1505 | 0.3317 | 0.1615 | 0.2600 | 0.1595 |
| | BIC F | 0.2300 | 0.1437 | 0.2083 | 0.1467 | 0.2067 | 0.1463 | 0.1317 | 0.1119 | 0.2050 | 0.1316 | 0.2100 | 0.1245 | 0.1383 | 0.1162 | 0.2200 | 0.1273 | 0.2283 | 0.1176 | 0.1717 | 0.1241 |
| | AIC SF | 0.3617 | 0.1676 | 0.3333 | 0.1820 | 0.3150 | 0.1739 | 0.2483 | 0.1650 | 0.3217 | 0.1503 | 0.3167 | 0.1526 | 0.2017 | 0.1646 | 0.3417 | 0.1505 | 0.3233 | 0.1586 | 0.2550 | 0.1488 |
| | BIC SF | 0.2283 | 0.1415 | 0.2050 | 0.1418 | 0.2067 | 0.1463 | 0.1300 | 0.1100 | 0.2050 | 0.1316 | 0.2100 | 0.1245 | 0.1383 | 0.1162 | 0.2200 | 0.1273 | 0.2283 | 0.1176 | 0.1717 | 0.1241 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0300 | 0.1193 | 0.0217 | 0.0907 | 0.0600 | 0.1220 | 0.1000 | 0.1553 | 0.0217 | 0.0655 | 0.0183 | 0.0666 | 0.0700 | 0.1385 | 0.0217 | 0.0611 | 0.0367 | 0.1100 | 0.0433 | 0.0966 |
| | E-net | 0.0300 | 0.1193 | 0.0233 | 0.0948 | 0.0650 | 0.1273 | 0.1167 | 0.1812 | 0.0217 | 0.0655 | 0.0183 | 0.0666 | 0.0850 | 0.1700 | 0.0217 | 0.0611 | 0.0367 | 0.1150 | 0.0517 | 0.1129 |
| | SCAD | 0.2767 | 0.2755 | 0.2850 | 0.3027 | 0.3083 | 0.2827 | 0.1967 | 0.2522 | 0.2283 | 0.2341 | 0.2483 | 0.2433 | 0.1717 | 0.1887 | 0.1900 | 0.1939 | 0.2833 | 0.2935 | 0.2333 | 0.2235 |
| | MCP | 0.2417 | 0.2684 | 0.2533 | 0.3057 | 0.2767 | 0.2894 | 0.1933 | 0.2548 | 0.1967 | 0.2500 | 0.1800 | 0.2006 | 0.1500 | 0.1796 | 0.1550 | 0.1761 | 0.2600 | 0.2826 | 0.1850 | 0.2144 |

Table 56: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 50$ and $p = 100$. See Figure 56 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.2067 | 0.1008 | 0.2383 | 0.1066 | 0.2633 | 0.1365 | 0.1933 | 0.1270 | 0.2267 | 0.1073 | 0.2483 | 0.1124 | 0.4000 | 0.1675 | 0.2583 | 0.1306 | 0.3233 | 0.1655 | 0.3317 | 0.1667 |
| | E-net | 0.2117 | 0.1029 | 0.2550 | 0.1147 | 0.2867 | 0.1573 | 0.2367 | 0.1258 | 0.2317 | 0.1108 | 0.2767 | 0.1324 | 0.5400 | 0.1837 | 0.2683 | 0.1338 | 0.3583 | 0.1731 | 0.4200 | 0.1649 |
| | SCAD | 0.2767 | 0.1236 | 0.2600 | 0.1168 | 0.2400 | 0.1094 | 0.1083 | 0.1121 | 0.2783 | 0.1480 | 0.2350 | 0.1062 | 0.1917 | 0.0898 | 0.2550 | 0.1097 | 0.2383 | 0.1092 | 0.1517 | 0.1233 |
| | MCP | 0.2183 | 0.0877 | 0.2083 | 0.0833 | 0.1850 | 0.0666 | 0.0783 | 0.0931 | 0.2117 | 0.0943 | 0.2083 | 0.0763 | 0.1633 | 0.0748 | 0.2117 | 0.0849 | 0.1950 | 0.0713 | 0.1150 | 0.0968 |
| 3 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0950 | 0.1118 | 0.1200 | 0.1162 | 0.1400 | 0.1201 | 0.0933 | 0.1119 | 0.1050 | 0.1200 | 0.1383 | 0.1137 | 0.2033 | 0.1546 | 0.1150 | 0.0996 | 0.1467 | 0.1282 | 0.1567 | 0.1514 |
| | E-net | 0.0950 | 0.1142 | 0.1233 | 0.1222 | 0.1433 | 0.1254 | 0.1283 | 0.1316 | 0.1017 | 0.1182 | 0.1350 | 0.1129 | 0.2417 | 0.1959 | 0.1167 | 0.1046 | 0.1500 | 0.1391 | 0.2150 | 0.1824 |
| | SCAD | 0.2383 | 0.1214 | 0.2550 | 0.1264 | 0.1983 | 0.1103 | 0.0733 | 0.1014 | 0.2433 | 0.1369 | 0.2383 | 0.1142 | 0.1967 | 0.0988 | 0.2233 | 0.1091 | 0.2250 | 0.1239 | 0.1300 | 0.1352 |
| | MCP | 0.1917 | 0.1069 | 0.2117 | 0.0973 | 0.1567 | 0.0881 | 0.0633 | 0.0847 | 0.1917 | 0.1043 | 0.1933 | 0.0811 | 0.1483 | 0.0883 | 0.1783 | 0.0829 | 0.1683 | 0.0870 | 0.0883 | 0.0931 |
| 6 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0250 | 0.0833 | 0.0333 | 0.1111 | 0.0350 | 0.0956 | 0.0267 | 0.0614 | 0.0150 | 0.0631 | 0.0267 | 0.0739 | 0.0417 | 0.1069 | 0.0300 | 0.0959 | 0.0183 | 0.0622 | 0.0233 | 0.0581 |
| | E-net | 0.0250 | 0.0833 | 0.0333 | 0.1033 | 0.0367 | 0.0993 | 0.0400 | 0.0790 | 0.0183 | 0.0707 | 0.0267 | 0.0776 | 0.0467 | 0.1233 | 0.0283 | 0.0949 | 0.0200 | 0.0682 | 0.0367 | 0.0771 |
| | SCAD | 0.1400 | 0.1548 | 0.1350 | 0.1334 | 0.1033 | 0.1356 | 0.0350 | 0.0760 | 0.1333 | 0.1460 | 0.1517 | 0.1462 | 0.1250 | 0.1542 | 0.1417 | 0.1448 | 0.1183 | 0.1407 | 0.0633 | 0.0941 |
| | MCP | 0.1017 | 0.1338 | 0.1100 | 0.1258 | 0.0567 | 0.0893 | 0.0267 | 0.0658 | 0.1017 | 0.1229 | 0.1133 | 0.1205 | 0.0617 | 0.0875 | 0.1050 | 0.1200 | 0.0617 | 0.0937 | 0.0483 | 0.0796 |

Table 57: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 50$ and $p = 2000$. See Figure 57 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1383 | 0.0672 | 0.1733 | 0.0525 | 0.1800 | 0.0565 | 0.0783 | 0.0836 | 0.1667 | 0.0711 | 0.1967 | 0.0959 | 0.3567 | 0.1480 | 0.1867 | 0.0722 | 0.2533 | 0.1098 | 0.1850 | 0.1158 |
| | E-net | 0.1383 | 0.0672 | 0.1750 | 0.0549 | 0.1817 | 0.0585 | 0.0950 | 0.0984 | 0.1650 | 0.0767 | 0.2050 | 0.1082 | 0.4750 | 0.1596 | 0.1983 | 0.0844 | 0.2650 | 0.1187 | 0.2533 | 0.1544 |
| | SCAD | 0.1783 | 0.0721 | 0.1867 | 0.0594 | 0.1683 | 0.0443 | 0.0550 | 0.0788 | 0.2033 | 0.0733 | 0.1933 | 0.0739 | 0.1933 | 0.1270 | 0.1967 | 0.0726 | 0.2067 | 0.0890 | 0.1133 | 0.1228 |
| | MCP | 0.1583 | 0.0435 | 0.1767 | 0.0520 | 0.1467 | 0.0544 | 0.0367 | 0.0694 | 0.1767 | 0.0520 | 0.1767 | 0.0463 | 0.1250 | 0.0866 | 0.1717 | 0.0286 | 0.1633 | 0.0669 | 0.0633 | 0.0813 |
| 3 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0500 | 0.0768 | 0.0933 | 0.0927 | 0.0950 | 0.0894 | 0.0233 | 0.0581 | 0.0733 | 0.0896 | 0.0683 | 0.0950 | 0.1517 | 0.1443 | 0.0683 | 0.0920 | 0.1267 | 0.1278 | 0.0783 | 0.1147 |
| | E-net | 0.0517 | 0.0810 | 0.0883 | 0.0931 | 0.1000 | 0.0917 | 0.0300 | 0.0686 | 0.0700 | 0.0923 | 0.0717 | 0.1012 | 0.1967 | 0.1930 | 0.0667 | 0.0917 | 0.1283 | 0.1316 | 0.1100 | 0.1324 |
| | SCAD | 0.1600 | 0.0915 | 0.1717 | 0.0869 | 0.1300 | 0.0905 | 0.0217 | 0.0563 | 0.1700 | 0.0947 | 0.1733 | 0.1206 | 0.1650 | 0.1046 | 0.1550 | 0.0955 | 0.1833 | 0.1046 | 0.0633 | 0.0879 |
| | MCP | 0.1417 | 0.0833 | 0.1383 | 0.0856 | 0.0917 | 0.0866 | 0.0183 | 0.0524 | 0.1500 | 0.0902 | 0.1517 | 0.1008 | 0.1250 | 0.0763 | 0.1333 | 0.0821 | 0.1367 | 0.0799 | 0.0517 | 0.0775 |
| 6 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0033 | 0.0235 | 0.0067 | 0.0328 | 0.0100 | 0.0463 | 0.0017 | 0.0167 | 0.0050 | 0.0286 | 0.0083 | 0.0435 | 0.0267 | 0.0877 | 0.0083 | 0.0365 | 0.0283 | 0.0822 | 0.0133 | 0.0512 |
| | E-net | 0.0033 | 0.0235 | 0.0067 | 0.0328 | 0.0117 | 0.0489 | 0.0067 | 0.0328 | 0.0050 | 0.0286 | 0.0067 | 0.0405 | 0.0333 | 0.1111 | 0.0083 | 0.0365 | 0.0300 | 0.0834 | 0.0200 | 0.0722 |
| | SCAD | 0.0500 | 0.0838 | 0.0567 | 0.0924 | 0.0333 | 0.0786 | 0.0067 | 0.0328 | 0.0700 | 0.1037 | 0.0650 | 0.1108 | 0.0967 | 0.1235 | 0.0583 | 0.1015 | 0.0833 | 0.1148 | 0.0333 | 0.0821 |
| | MCP | 0.0267 | 0.0614 | 0.0417 | 0.0763 | 0.0150 | 0.0479 | 0.0033 | 0.0235 | 0.0400 | 0.0825 | 0.0483 | 0.0896 | 0.0567 | 0.0793 | 0.0400 | 0.0754 | 0.0533 | 0.0883 | 0.0200 | 0.0544 |

Table 58: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 200$ and $p = 10$. See Figure 58 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.5467 | 0.1537 | 0.5333 | 0.1641 | 0.4833 | 0.1489 | 0.3583 | 0.1560 | 0.5317 | 0.1530 | 0.4683 | 0.1291 | 0.3950 | 0.1635 | 0.5083 | 0.1284 | 0.4883 | 0.1407 | 0.3733 | 0.1519 |
| | BIC B | 0.3400 | 0.1296 | 0.3600 | 0.1247 | 0.3300 | 0.1319 | 0.2250 | 0.0898 | 0.3583 | 0.1217 | 0.3200 | 0.0908 | 0.2567 | 0.1017 | 0.3550 | 0.1223 | 0.3383 | 0.1097 | 0.2383 | 0.0925 |
| | AIC SB | 0.5467 | 0.1537 | 0.5333 | 0.1641 | 0.4833 | 0.1489 | 0.3583 | 0.1560 | 0.5333 | 0.1517 | 0.4700 | 0.1284 | 0.3950 | 0.1635 | 0.5083 | 0.1284 | 0.4883 | 0.1407 | 0.3733 | 0.1519 |
| | BIC SB | 0.3400 | 0.1296 | 0.3600 | 0.1247 | 0.3300 | 0.1319 | 0.2250 | 0.0898 | 0.3583 | 0.1217 | 0.3217 | 0.0894 | 0.2567 | 0.1017 | 0.3550 | 0.1223 | 0.3383 | 0.1097 | 0.2383 | 0.0925 |
| | AIC F | 0.5433 | 0.1582 | 0.5317 | 0.1619 | 0.4783 | 0.1492 | 0.3367 | 0.1553 | 0.5233 | 0.1517 | 0.4583 | 0.1284 | 0.3683 | 0.1466 | 0.5050 | 0.1307 | 0.4750 | 0.1284 | 0.3617 | 0.1536 |
| | BIC F | 0.3400 | 0.1296 | 0.3567 | 0.1208 | 0.3250 | 0.1284 | 0.2200 | 0.0850 | 0.3567 | 0.1185 | 0.3183 | 0.0920 | 0.2517 | 0.0902 | 0.3483 | 0.1187 | 0.3317 | 0.1124 | 0.2350 | 0.0889 |
| | AIC SF | 0.5433 | 0.1582 | 0.5317 | 0.1619 | 0.4783 | 0.1492 | 0.3367 | 0.1553 | 0.5233 | 0.1517 | 0.4567 | 0.1267 | 0.3683 | 0.1466 | 0.5000 | 0.1276 | 0.4767 | 0.1319 | 0.3633 | 0.1542 |
| | BIC SF | 0.3400 | 0.1296 | 0.3567 | 0.1208 | 0.3250 | 0.1284 | 0.2200 | 0.0850 | 0.3550 | 0.1176 | 0.3167 | 0.0870 | 0.2517 | 0.0902 | 0.3483 | 0.1187 | 0.3300 | 0.1085 | 0.2333 | 0.0886 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.3467 | 0.1875 | 0.4250 | 0.1714 | 0.4967 | 0.1606 | 0.4933 | 0.1707 | 0.3667 | 0.1835 | 0.4033 | 0.1323 | 0.4633 | 0.1564 | 0.3767 | 0.1617 | 0.4583 | 0.1747 | 0.4833 | 0.1796 |
| | E-net | 0.3600 | 0.1891 | 0.4600 | 0.1710 | 0.5550 | 0.1608 | 0.6350 | 0.1784 | 0.3867 | 0.1802 | 0.4383 | 0.1290 | 0.5867 | 0.1469 | 0.4150 | 0.1598 | 0.5183 | 0.1673 | 0.6417 | 0.1747 |
| | SCAD | 0.6250 | 0.2610 | 0.6017 | 0.2679 | 0.5350 | 0.2555 | 0.3083 | 0.2070 | 0.6383 | 0.2474 | 0.5667 | 0.2235 | 0.2833 | 0.1749 | 0.6017 | 0.2528 | 0.5417 | 0.2663 | 0.3283 | 0.2339 |
| | MCP | 0.5750 | 0.2837 | 0.5417 | 0.2876 | 0.4883 | 0.2735 | 0.3000 | 0.2038 | 0.5850 | 0.2727 | 0.4833 | 0.2398 | 0.3033 | 0.1841 | 0.5300 | 0.2695 | 0.5050 | 0.2847 | 0.3150 | 0.2308 |
| 3 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.3733 | 0.1573 | 0.3850 | 0.1636 | 0.3767 | 0.1491 | 0.3200 | 0.1548 | 0.3667 | 0.1535 | 0.3900 | 0.1645 | 0.3967 | 0.1688 | 0.3933 | 0.1508 | 0.3683 | 0.1559 | 0.3683 | 0.1646 |
| | BIC B | 0.2250 | 0.0898 | 0.2400 | 0.0927 | 0.2400 | 0.1041 | 0.1967 | 0.0763 | 0.2383 | 0.0984 | 0.2383 | 0.1012 | 0.2317 | 0.0974 | 0.2283 | 0.0875 | 0.2133 | 0.0857 | 0.2250 | 0.0866 |
| | AIC SB | 0.3733 | 0.1573 | 0.3850 | 0.1636 | 0.3767 | 0.1491 | 0.3200 | 0.1548 | 0.3667 | 0.1535 | 0.3917 | 0.1648 | 0.3983 | 0.1690 | 0.3933 | 0.1508 | 0.3683 | 0.1559 | 0.3683 | 0.1646 |
| | BIC SB | 0.2250 | 0.0898 | 0.2400 | 0.0927 | 0.2400 | 0.1041 | 0.1967 | 0.0763 | 0.2383 | 0.0984 | 0.2400 | 0.1014 | 0.2333 | 0.0948 | 0.2300 | 0.0879 | 0.2133 | 0.0857 | 0.2250 | 0.0866 |
| | AIC F | 0.3633 | 0.1560 | 0.3767 | 0.1565 | 0.3550 | 0.1374 | 0.2933 | 0.1384 | 0.3583 | 0.1486 | 0.3467 | 0.1529 | 0.3233 | 0.1476 | 0.3883 | 0.1499 | 0.3450 | 0.1522 | 0.3333 | 0.1517 |
| | BIC F | 0.2217 | 0.0856 | 0.2417 | 0.0929 | 0.2333 | 0.0977 | 0.1867 | 0.0722 | 0.2367 | 0.0953 | 0.2333 | 0.0977 | 0.2267 | 0.0871 | 0.2233 | 0.0828 | 0.2100 | 0.0808 | 0.2167 | 0.0803 |
| | AIC SF | 0.3633 | 0.1560 | 0.3767 | 0.1565 | 0.3550 | 0.1374 | 0.2933 | 0.1384 | 0.3583 | 0.1486 | 0.3450 | 0.1522 | 0.3083 | 0.1284 | 0.3867 | 0.1458 | 0.3450 | 0.1522 | 0.3333 | 0.1517 |
| | BIC SF | 0.2217 | 0.0856 | 0.2417 | 0.0929 | 0.2333 | 0.0977 | 0.1867 | 0.0722 | 0.2367 | 0.0953 | 0.2317 | 0.0974 | 0.2267 | 0.0871 | 0.2233 | 0.0828 | 0.2100 | 0.0808 | 0.2150 | 0.0796 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1733 | 0.0576 | 0.1917 | 0.0929 | 0.2167 | 0.1019 | 0.2917 | 0.1239 | 0.1633 | 0.0669 | 0.1850 | 0.0745 | 0.2667 | 0.1319 | 0.1650 | 0.0374 | 0.1883 | 0.0773 | 0.2683 | 0.1673 |
| | E-net | 0.1733 | 0.0576 | 0.2117 | 0.1132 | 0.2383 | 0.1118 | 0.4483 | 0.1905 | 0.1683 | 0.0730 | 0.1850 | 0.0745 | 0.3333 | 0.1460 | 0.1667 | 0.0474 | 0.1967 | 0.0898 | 0.3500 | 0.2017 |
| | SCAD | 0.3583 | 0.2466 | 0.4067 | 0.2715 | 0.3667 | 0.2496 | 0.2683 | 0.2144 | 0.3817 | 0.2641 | 0.3383 | 0.2215 | 0.2900 | 0.1962 | 0.3717 | 0.2437 | 0.3433 | 0.2195 | 0.3183 | 0.2273 |
| | MCP | 0.3217 | 0.2187 | 0.3683 | 0.2641 | 0.3200 | 0.2400 | 0.2600 | 0.2083 | 0.3483 | 0.2733 | 0.2967 | 0.2018 | 0.2650 | 0.1852 | 0.3417 | 0.2544 | 0.3100 | 0.2451 | 0.2900 | 0.2046 |
| 6 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.3583 | 0.1486 | 0.3867 | 0.1496 | 0.3750 | 0.1681 | 0.2883 | 0.1587 | 0.3617 | 0.1625 | 0.3650 | 0.1670 | 0.3617 | 0.1642 | 0.3767 | 0.1472 | 0.3467 | 0.1511 | 0.3433 | 0.1754 |
| | BIC B | 0.2217 | 0.0856 | 0.2433 | 0.1017 | 0.2233 | 0.1039 | 0.1467 | 0.0956 | 0.2300 | 0.0941 | 0.2250 | 0.0866 | 0.2000 | 0.1161 | 0.2333 | 0.1005 | 0.2133 | 0.0889 | 0.2183 | 0.1051 |
| | AIC SB | 0.3583 | 0.1486 | 0.3867 | 0.1496 | 0.3750 | 0.1681 | 0.2883 | 0.1587 | 0.3617 | 0.1625 | 0.3650 | 0.1670 | 0.3617 | 0.1642 | 0.3767 | 0.1472 | 0.3467 | 0.1511 | 0.3433 | 0.1754 |
| | BIC SB | 0.2217 | 0.0856 | 0.2433 | 0.1017 | 0.2233 | 0.1039 | 0.1467 | 0.0956 | 0.2300 | 0.0941 | 0.2267 | 0.0871 | 0.2000 | 0.1161 | 0.2333 | 0.1005 | 0.2133 | 0.0889 | 0.2183 | 0.1051 |
| | AIC F | 0.3517 | 0.1458 | 0.3783 | 0.1438 | 0.3517 | 0.1723 | 0.2500 | 0.1544 | 0.3450 | 0.1522 | 0.3350 | 0.1598 | 0.2867 | 0.1500 | 0.3600 | 0.1435 | 0.3283 | 0.1469 | 0.2933 | 0.1482 |
| | BIC F | 0.2217 | 0.0856 | 0.2400 | 0.1041 | 0.2067 | 0.0921 | 0.1233 | 0.0842 | 0.2283 | 0.0937 | 0.2217 | 0.0788 | 0.1783 | 0.1039 | 0.2250 | 0.0929 | 0.2117 | 0.0882 | 0.2067 | 0.1008 |
| | AIC SF | 0.3517 | 0.1458 | 0.3783 | 0.1438 | 0.3500 | 0.1700 | 0.2500 | 0.1544 | 0.3450 | 0.1522 | 0.3333 | 0.1553 | 0.2783 | 0.1442 | 0.3583 | 0.1389 | 0.3283 | 0.1469 | 0.2917 | 0.1448 |
| | BIC SF | 0.2217 | 0.0856 | 0.2400 | 0.1041 | 0.2067 | 0.0921 | 0.1233 | 0.0842 | 0.2283 | 0.0937 | 0.2217 | 0.0788 | 0.1783 | 0.1039 | 0.2250 | 0.0929 | 0.2117 | 0.0882 | 0.2067 | 0.1008 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0383 | 0.0849 | 0.0633 | 0.1054 | 0.0533 | 0.0944 | 0.1017 | 0.1399 | 0.0317 | 0.0699 | 0.0450 | 0.0849 | 0.0733 | 0.1304 | 0.0250 | 0.0643 | 0.0350 | 0.0831 | 0.0500 | 0.1019 |
| | E-net | 0.0383 | 0.0849 | 0.0600 | 0.1047 | 0.0567 | 0.1039 | 0.1350 | 0.1799 | 0.0317 | 0.0699 | 0.0450 | 0.0882 | 0.0917 | 0.1542 | 0.0250 | 0.0643 | 0.0350 | 0.0831 | 0.0583 | 0.1170 |
| | SCAD | 0.3417 | 0.2070 | 0.3717 | 0.2414 | 0.3483 | 0.2273 | 0.2717 | 0.2400 | 0.3400 | 0.2170 | 0.3500 | 0.2254 | 0.2767 | 0.1957 | 0.3933 | 0.2502 | 0.3300 | 0.2024 | 0.3033 | 0.2084 |
| | MCP | 0.2817 | 0.2006 | 0.3167 | 0.2422 | 0.3117 | 0.2602 | 0.2250 | 0.2373 | 0.2750 | 0.2057 | 0.2883 | 0.2246 | 0.2567 | 0.2177 | 0.3367 | 0.2518 | 0.2750 | 0.1841 | 0.2650 | 0.2025 |

Table 59: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 200$ and $p = 100$. See Figure 59 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC F | 0.5500 | 0.1781 | 0.5567 | 0.1465 | 0.4783 | 0.1799 | 0.3850 | 0.1784 | 0.5617 | 0.1686 | 0.5267 | 0.1670 | 0.3833 | 0.1431 | 0.5183 | 0.1569 | 0.5367 | 0.1798 | 0.3883 | 0.1499 |
| | BIC F | 0.3583 | 0.1448 | 0.3250 | 0.1262 | 0.2833 | 0.1371 | 0.2050 | 0.0705 | 0.3383 | 0.1147 | 0.3450 | 0.0894 | 0.2533 | 0.0962 | 0.3517 | 0.1273 | 0.3200 | 0.1128 | 0.2133 | 0.0789 |
| | AIC SF | 0.5483 | 0.1746 | 0.5400 | 0.1443 | 0.4767 | 0.1804 | 0.3883 | 0.1805 | 0.5367 | 0.1634 | 0.5067 | 0.1588 | 0.3700 | 0.1331 | 0.5033 | 0.1571 | 0.5217 | 0.1669 | 0.3883 | 0.1518 |
| | BIC SF | 0.3550 | 0.1415 | 0.3250 | 0.1262 | 0.2783 | 0.1362 | 0.2033 | 0.0694 | 0.3367 | 0.1111 | 0.3450 | 0.0894 | 0.2517 | 0.0991 | 0.3517 | 0.1273 | 0.3183 | 0.1114 | 0.2133 | 0.0789 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.2400 | 0.1261 | 0.3333 | 0.1479 | 0.3650 | 0.1435 | 0.3183 | 0.1321 | 0.2733 | 0.1351 | 0.3967 | 0.1293 | 0.4767 | 0.1910 | 0.3583 | 0.1486 | 0.4500 | 0.1633 | 0.4200 | 0.1580 |
| | E-net | 0.2533 | 0.1308 | 0.3683 | 0.1447 | 0.3850 | 0.1454 | 0.3583 | 0.1486 | 0.2983 | 0.1427 | 0.4367 | 0.1293 | 0.6050 | 0.1875 | 0.3917 | 0.1369 | 0.4983 | 0.1733 | 0.5433 | 0.1798 |
| | SCAD | 0.3683 | 0.1972 | 0.3700 | 0.1617 | 0.2883 | 0.1294 | 0.1800 | 0.0512 | 0.3417 | 0.1596 | 0.3650 | 0.1548 | 0.1883 | 0.0655 | 0.3917 | 0.1524 | 0.3483 | 0.1742 | 0.1783 | 0.0489 |
| | MCP | 0.2983 | 0.1680 | 0.3100 | 0.1461 | 0.2300 | 0.0999 | 0.1750 | 0.0365 | 0.2867 | 0.1383 | 0.2917 | 0.1095 | 0.1867 | 0.0594 | 0.3250 | 0.1542 | 0.2833 | 0.1330 | 0.1800 | 0.0512 |
| 3 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC F | 0.4283 | 0.1761 | 0.3967 | 0.1637 | 0.3983 | 0.1864 | 0.3250 | 0.1648 | 0.4417 | 0.1578 | 0.3750 | 0.1681 | 0.3250 | 0.1448 | 0.4367 | 0.1769 | 0.3933 | 0.1812 | 0.3083 | 0.1429 |
| | BIC F | 0.2300 | 0.0970 | 0.2233 | 0.0893 | 0.2117 | 0.0744 | 0.1600 | 0.0915 | 0.2433 | 0.1017 | 0.2300 | 0.0847 | 0.2150 | 0.0864 | 0.2433 | 0.0960 | 0.2217 | 0.0949 | 0.1700 | 0.0626 |
| | AIC SF | 0.4083 | 0.1630 | 0.3900 | 0.1539 | 0.3783 | 0.1722 | 0.3200 | 0.1583 | 0.4367 | 0.1549 | 0.3750 | 0.1714 | 0.3117 | 0.1415 | 0.4383 | 0.1751 | 0.3783 | 0.1786 | 0.3000 | 0.1421 |
| | BIC SF | 0.2300 | 0.0970 | 0.2233 | 0.0893 | 0.2117 | 0.0744 | 0.1600 | 0.0915 | 0.2417 | 0.1015 | 0.2300 | 0.0847 | 0.2100 | 0.0842 | 0.2433 | 0.0960 | 0.2200 | 0.0914 | 0.1700 | 0.0626 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1450 | 0.0655 | 0.1750 | 0.0725 | 0.2000 | 0.0821 | 0.1867 | 0.0830 | 0.1567 | 0.0520 | 0.1767 | 0.0398 | 0.2717 | 0.1374 | 0.1683 | 0.0604 | 0.1933 | 0.1025 | 0.2500 | 0.1219 |
| | E-net | 0.1450 | 0.0655 | 0.1750 | 0.0725 | 0.2100 | 0.0874 | 0.2183 | 0.1103 | 0.1567 | 0.0520 | 0.1783 | 0.0427 | 0.3667 | 0.1725 | 0.1700 | 0.0669 | 0.2150 | 0.1191 | 0.3533 | 0.1745 |
| | SCAD | 0.2517 | 0.1265 | 0.2533 | 0.1172 | 0.2333 | 0.1005 | 0.1533 | 0.0810 | 0.2400 | 0.1215 | 0.2250 | 0.0898 | 0.1850 | 0.0974 | 0.2767 | 0.1445 | 0.2567 | 0.1218 | 0.1583 | 0.0763 |
| | MCP | 0.1983 | 0.0810 | 0.2150 | 0.0926 | 0.2017 | 0.0760 | 0.1417 | 0.0799 | 0.2033 | 0.0806 | 0.2033 | 0.0733 | 0.1450 | 0.0773 | 0.2200 | 0.0944 | 0.1983 | 0.0699 | 0.1583 | 0.0643 |
| 6 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC F | 0.4000 | 0.1708 | 0.4000 | 0.1498 | 0.4033 | 0.1999 | 0.2850 | 0.1958 | 0.4217 | 0.1525 | 0.3717 | 0.1833 | 0.2633 | 0.1502 | 0.4450 | 0.1820 | 0.3633 | 0.1714 | 0.2133 | 0.1693 |
| | BIC F | 0.2200 | 0.0883 | 0.2183 | 0.0938 | 0.1917 | 0.0959 | 0.0500 | 0.0902 | 0.2300 | 0.0879 | 0.2367 | 0.0953 | 0.1500 | 0.1019 | 0.2233 | 0.0893 | 0.1900 | 0.1060 | 0.0850 | 0.0870 |
| | AIC SF | 0.3917 | 0.1630 | 0.4017 | 0.1519 | 0.3967 | 0.1936 | 0.2767 | 0.1838 | 0.4117 | 0.1430 | 0.3667 | 0.1788 | 0.2483 | 0.1470 | 0.4417 | 0.1810 | 0.3533 | 0.1646 | 0.2033 | 0.1651 |
| | BIC SF | 0.2200 | 0.0883 | 0.2183 | 0.0938 | 0.1900 | 0.0977 | 0.0500 | 0.0902 | 0.2300 | 0.0879 | 0.2367 | 0.0953 | 0.1483 | 0.0974 | 0.2233 | 0.0893 | 0.1883 | 0.1077 | 0.0850 | 0.0870 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0183 | 0.0575 | 0.0250 | 0.0686 | 0.0550 | 0.0978 | 0.0417 | 0.0866 | 0.0200 | 0.0639 | 0.0333 | 0.0749 | 0.0683 | 0.1114 | 0.0400 | 0.0825 | 0.0533 | 0.0914 | 0.0650 | 0.1133 |
| | E-net | 0.0167 | 0.0556 | 0.0250 | 0.0686 | 0.0550 | 0.0978 | 0.0533 | 0.1056 | 0.0183 | 0.0575 | 0.0333 | 0.0749 | 0.0883 | 0.1411 | 0.0400 | 0.0825 | 0.0533 | 0.0973 | 0.0817 | 0.1451 |
| | SCAD | 0.2367 | 0.1235 | 0.2450 | 0.1147 | 0.2167 | 0.1124 | 0.0700 | 0.0923 | 0.2417 | 0.1217 | 0.2433 | 0.1070 | 0.1683 | 0.1242 | 0.2433 | 0.1390 | 0.2367 | 0.1323 | 0.1333 | 0.1517 |
| | MCP | 0.1883 | 0.0907 | 0.1933 | 0.0909 | 0.1800 | 0.0938 | 0.0650 | 0.0851 | 0.2067 | 0.1036 | 0.2050 | 0.0780 | 0.1233 | 0.0906 | 0.1967 | 0.0898 | 0.1900 | 0.1137 | 0.0967 | 0.0827 |

Table 60: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 200$ and $p = 2000$. See Figure 60 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1783 | 0.0489 | 0.2183 | 0.0844 | 0.2133 | 0.0823 | 0.1767 | 0.0619 | 0.2200 | 0.0944 | 0.3217 | 0.1214 | 0.4467 | 0.1496 | 0.2883 | 0.1205 | 0.3467 | 0.1375 | 0.2700 | 0.1203 |
| | E-net | 0.1800 | 0.0512 | 0.2250 | 0.0929 | 0.2183 | 0.0877 | 0.1817 | 0.0674 | 0.2367 | 0.1037 | 0.3500 | 0.1308 | 0.5733 | 0.1559 | 0.3117 | 0.1223 | 0.3783 | 0.1378 | 0.3300 | 0.1460 |
| | SCAD | 0.2167 | 0.0902 | 0.2400 | 0.1068 | 0.2117 | 0.0816 | 0.1550 | 0.0489 | 0.2483 | 0.1098 | 0.2350 | 0.1138 | 0.1683 | 0.0167 | 0.2633 | 0.1258 | 0.2117 | 0.0849 | 0.1600 | 0.0328 |
| | MCP | 0.1817 | 0.0535 | 0.2050 | 0.0849 | 0.1817 | 0.0479 | 0.1383 | 0.0629 | 0.2167 | 0.0902 | 0.2067 | 0.0754 | 0.1667 | 0.0237 | 0.2183 | 0.0968 | 0.1850 | 0.0524 | 0.1567 | 0.0398 |
| 3 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1500 | 0.0503 | 0.1667 | 0.0530 | 0.1683 | 0.0443 | 0.1083 | 0.0898 | 0.1383 | 0.0672 | 0.1700 | 0.0473 | 0.2467 | 0.1329 | 0.1650 | 0.0167 | 0.1867 | 0.0639 | 0.1733 | 0.1003 |
| | E-net | 0.1483 | 0.0524 | 0.1667 | 0.0580 | 0.1700 | 0.0529 | 0.1217 | 0.0849 | 0.1367 | 0.0686 | 0.1700 | 0.0473 | 0.2983 | 0.1466 | 0.1650 | 0.0167 | 0.1967 | 0.0763 | 0.1950 | 0.1112 |
| | SCAD | 0.1950 | 0.0672 | 0.2017 | 0.0760 | 0.1867 | 0.0544 | 0.0983 | 0.0889 | 0.1867 | 0.0594 | 0.2117 | 0.0816 | 0.1817 | 0.0789 | 0.2000 | 0.0786 | 0.1983 | 0.0699 | 0.1400 | 0.0877 |
| | MCP | 0.1800 | 0.0454 | 0.1850 | 0.0524 | 0.1700 | 0.0333 | 0.0833 | 0.0902 | 0.1750 | 0.0365 | 0.1883 | 0.0563 | 0.1533 | 0.0656 | 0.1800 | 0.0512 | 0.1733 | 0.0328 | 0.1200 | 0.0789 |
| 6 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0133 | 0.0454 | 0.0267 | 0.0658 | 0.0333 | 0.0749 | 0.0117 | 0.0427 | 0.0150 | 0.0479 | 0.0283 | 0.0629 | 0.0517 | 0.1024 | 0.0233 | 0.0581 | 0.0383 | 0.0882 | 0.0233 | 0.0671 |
| | E-net | 0.0133 | 0.0454 | 0.0267 | 0.0658 | 0.0333 | 0.0749 | 0.0133 | 0.0454 | 0.0133 | 0.0454 | 0.0283 | 0.0629 | 0.0617 | 0.1223 | 0.0233 | 0.0581 | 0.0350 | 0.0896 | 0.0250 | 0.0686 |
| | SCAD | 0.1733 | 0.0974 | 0.1800 | 0.0876 | 0.1400 | 0.0969 | 0.0167 | 0.0503 | 0.1550 | 0.0829 | 0.1967 | 0.0867 | 0.2100 | 0.1394 | 0.1850 | 0.0883 | 0.1917 | 0.0898 | 0.0733 | 0.1068 |
| | MCP | 0.1600 | 0.0851 | 0.1567 | 0.0848 | 0.1100 | 0.0924 | 0.0117 | 0.0427 | 0.1467 | 0.0796 | 0.1683 | 0.0690 | 0.1150 | 0.0810 | 0.1733 | 0.0818 | 0.1667 | 0.0854 | 0.0433 | 0.0735 |

Table 61: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 1000$ and $p = 10$. See Figure 61 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.6183 | 0.1143 | 0.6217 | 0.1250 | 0.6100 | 0.1258 | 0.4550 | 0.1587 | 0.5933 | 0.1144 | 0.6183 | 0.1304 | 0.4883 | 0.1366 | 0.6017 | 0.1158 | 0.5800 | 0.1148 | 0.4850 | 0.1423 |
| | BIC B | 0.5100 | 0.0520 | 0.5100 | 0.0619 | 0.4700 | 0.0834 | 0.2850 | 0.1041 | 0.5017 | 0.0374 | 0.4800 | 0.0863 | 0.3383 | 0.0553 | 0.5050 | 0.0500 | 0.4800 | 0.0830 | 0.3217 | 0.0894 |
| | AIC SB | 0.6183 | 0.1143 | 0.6217 | 0.1250 | 0.6100 | 0.1258 | 0.4550 | 0.1587 | 0.5933 | 0.1144 | 0.6183 | 0.1304 | 0.4883 | 0.1366 | 0.6017 | 0.1158 | 0.5800 | 0.1148 | 0.4850 | 0.1423 |
| | BIC SB | 0.5100 | 0.0520 | 0.5100 | 0.0619 | 0.4700 | 0.0834 | 0.2850 | 0.1041 | 0.5017 | 0.0374 | 0.4800 | 0.0863 | 0.3383 | 0.0553 | 0.5050 | 0.0500 | 0.4800 | 0.0830 | 0.3217 | 0.0894 |
| | AIC F | 0.6183 | 0.1143 | 0.6217 | 0.1250 | 0.6067 | 0.1197 | 0.4367 | 0.1494 | 0.5917 | 0.1145 | 0.6067 | 0.1265 | 0.4533 | 0.1255 | 0.5983 | 0.1138 | 0.5700 | 0.1064 | 0.4700 | 0.1327 |
| | BIC F | 0.5100 | 0.0520 | 0.5100 | 0.0619 | 0.4700 | 0.0834 | 0.2833 | 0.1019 | 0.5017 | 0.0374 | 0.4817 | 0.0883 | 0.3350 | 0.0443 | 0.5050 | 0.0500 | 0.4767 | 0.0750 | 0.3200 | 0.0876 |
| | AIC SF | 0.6183 | 0.1143 | 0.6217 | 0.1250 | 0.6067 | 0.1197 | 0.4367 | 0.1494 | 0.5917 | 0.1145 | 0.6067 | 0.1265 | 0.4500 | 0.1173 | 0.5983 | 0.1138 | 0.5700 | 0.1064 | 0.4700 | 0.1327 |
| | BIC SF | 0.5100 | 0.0520 | 0.5100 | 0.0619 | 0.4700 | 0.0834 | 0.2833 | 0.1019 | 0.5017 | 0.0374 | 0.4800 | 0.0863 | 0.3350 | 0.0443 | 0.5050 | 0.0500 | 0.4767 | 0.0750 | 0.3200 | 0.0876 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.4867 | 0.0967 | 0.5267 | 0.0739 | 0.5833 | 0.1219 | 0.5700 | 0.1425 | 0.4900 | 0.0463 | 0.5217 | 0.0907 | 0.5350 | 0.1522 | 0.4933 | 0.0525 | 0.5433 | 0.0966 | 0.5733 | 0.1347 |
| | E-net | 0.5017 | 0.0837 | 0.5467 | 0.0920 | 0.6183 | 0.1238 | 0.7600 | 0.1577 | 0.4983 | 0.0374 | 0.5267 | 0.0939 | 0.6383 | 0.1480 | 0.5000 | 0.0474 | 0.5600 | 0.1099 | 0.7100 | 0.1528 |
| | SCAD | 0.6783 | 0.1484 | 0.6617 | 0.1732 | 0.6667 | 0.1880 | 0.3800 | 0.1955 | 0.6717 | 0.1507 | 0.6583 | 0.1747 | 0.5417 | 0.2577 | 0.6567 | 0.1722 | 0.6350 | 0.1653 | 0.5633 | 0.2770 |
| | MCP | 0.6283 | 0.1457 | 0.6450 | 0.1703 | 0.6433 | 0.2024 | 0.3850 | 0.2020 | 0.6150 | 0.1548 | 0.6233 | 0.1767 | 0.5333 | 0.2462 | 0.6067 | 0.1684 | 0.5983 | 0.1693 | 0.5550 | 0.2763 |
| 3 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.4233 | 0.1449 | 0.4333 | 0.1692 | 0.4100 | 0.1648 | 0.3367 | 0.1589 | 0.4500 | 0.1562 | 0.4133 | 0.1598 | 0.3633 | 0.1560 | 0.3900 | 0.1539 | 0.4033 | 0.1444 | 0.3600 | 0.1355 |
| | BIC B | 0.2200 | 0.0816 | 0.2233 | 0.0954 | 0.2150 | 0.0896 | 0.1983 | 0.0699 | 0.2367 | 0.0860 | 0.2217 | 0.0919 | 0.2017 | 0.0760 | 0.2117 | 0.0882 | 0.2050 | 0.0744 | 0.2000 | 0.0749 |
| | AIC SB | 0.4233 | 0.1449 | 0.4333 | 0.1692 | 0.4100 | 0.1648 | 0.3367 | 0.1589 | 0.4500 | 0.1562 | 0.4133 | 0.1598 | 0.3633 | 0.1560 | 0.3900 | 0.1539 | 0.4033 | 0.1444 | 0.3600 | 0.1355 |
| | BIC SB | 0.2200 | 0.0816 | 0.2233 | 0.0954 | 0.2150 | 0.0896 | 0.1983 | 0.0699 | 0.2367 | 0.0860 | 0.2250 | 0.0929 | 0.2017 | 0.0760 | 0.2117 | 0.0882 | 0.2050 | 0.0744 | 0.2000 | 0.0749 |
| | AIC F | 0.4233 | 0.1449 | 0.4217 | 0.1732 | 0.4017 | 0.1626 | 0.3167 | 0.1508 | 0.4483 | 0.1548 | 0.3900 | 0.1557 | 0.3217 | 0.1386 | 0.3900 | 0.1575 | 0.3950 | 0.1374 | 0.3317 | 0.1350 |
| | BIC F | 0.2200 | 0.0816 | 0.2233 | 0.0954 | 0.2100 | 0.0842 | 0.1983 | 0.0699 | 0.2367 | 0.0860 | 0.2217 | 0.0888 | 0.2050 | 0.0744 | 0.2083 | 0.0763 | 0.2017 | 0.0722 | 0.1983 | 0.0738 |
| | AIC SF | 0.4233 | 0.1449 | 0.4217 | 0.1732 | 0.4017 | 0.1626 | 0.3167 | 0.1508 | 0.4483 | 0.1548 | 0.3900 | 0.1557 | 0.3167 | 0.1350 | 0.3883 | 0.1536 | 0.3950 | 0.1374 | 0.3317 | 0.1350 |
| | BIC SF | 0.2200 | 0.0816 | 0.2233 | 0.0954 | 0.2100 | 0.0842 | 0.1983 | 0.0699 | 0.2367 | 0.0860 | 0.2217 | 0.0888 | 0.2050 | 0.0744 | 0.2083 | 0.0763 | 0.2017 | 0.0722 | 0.1983 | 0.0738 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1683 | 0.0167 | 0.1817 | 0.0479 | 0.2133 | 0.1035 | 0.3167 | 0.1544 | 0.1717 | 0.0286 | 0.1850 | 0.0575 | 0.2783 | 0.1232 | 0.1700 | 0.0235 | 0.1833 | 0.0556 | 0.2917 | 0.1348 |
| | E-net | 0.1700 | 0.0235 | 0.1833 | 0.0503 | 0.2400 | 0.1192 | 0.5433 | 0.1635 | 0.1733 | 0.0405 | 0.1867 | 0.0594 | 0.4133 | 0.1632 | 0.1733 | 0.0328 | 0.1917 | 0.0686 | 0.4517 | 0.1729 |
| | SCAD | 0.4700 | 0.2455 | 0.4933 | 0.2710 | 0.4517 | 0.2725 | 0.3267 | 0.2461 | 0.5567 | 0.2418 | 0.4733 | 0.2790 | 0.3017 | 0.2206 | 0.4367 | 0.2538 | 0.4400 | 0.2590 | 0.2933 | 0.2134 |
| | MCP | 0.3983 | 0.2495 | 0.3967 | 0.2730 | 0.4267 | 0.2933 | 0.3317 | 0.2479 | 0.4933 | 0.2710 | 0.4117 | 0.2886 | 0.2667 | 0.2197 | 0.3817 | 0.2544 | 0.3967 | 0.2760 | 0.2850 | 0.2056 |
| 6 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC B | 0.3667 | 0.1401 | 0.3633 | 0.1681 | 0.3867 | 0.1739 | 0.3350 | 0.1451 | 0.4017 | 0.1423 | 0.3767 | 0.1617 | 0.3500 | 0.1633 | 0.3583 | 0.1648 | 0.3617 | 0.1422 | 0.3583 | 0.1306 |
| | BIC B | 0.2183 | 0.0844 | 0.2200 | 0.0850 | 0.2233 | 0.0861 | 0.1867 | 0.0594 | 0.2183 | 0.0908 | 0.2150 | 0.0760 | 0.2067 | 0.0825 | 0.2067 | 0.0715 | 0.2050 | 0.0705 | 0.2150 | 0.0760 |
| | AIC SB | 0.3667 | 0.1401 | 0.3633 | 0.1681 | 0.3867 | 0.1739 | 0.3350 | 0.1451 | 0.4017 | 0.1423 | 0.3767 | 0.1617 | 0.3500 | 0.1633 | 0.3583 | 0.1648 | 0.3617 | 0.1422 | 0.3583 | 0.1306 |
| | BIC SB | 0.2183 | 0.0844 | 0.2200 | 0.0850 | 0.2233 | 0.0861 | 0.1867 | 0.0594 | 0.2183 | 0.0908 | 0.2150 | 0.0760 | 0.2067 | 0.0825 | 0.2067 | 0.0715 | 0.2050 | 0.0705 | 0.2150 | 0.0760 |
| | AIC F | 0.3650 | 0.1375 | 0.3533 | 0.1576 | 0.3550 | 0.1565 | 0.3000 | 0.1340 | 0.3933 | 0.1372 | 0.3500 | 0.1615 | 0.2967 | 0.1373 | 0.3483 | 0.1626 | 0.3417 | 0.1409 | 0.3283 | 0.1195 |
| | BIC F | 0.2167 | 0.0838 | 0.2200 | 0.0850 | 0.2217 | 0.0856 | 0.1867 | 0.0594 | 0.2133 | 0.0789 | 0.2133 | 0.0752 | 0.2050 | 0.0816 | 0.2067 | 0.0715 | 0.2017 | 0.0682 | 0.2167 | 0.0768 |
| | AIC SF | 0.3650 | 0.1375 | 0.3533 | 0.1576 | 0.3550 | 0.1565 | 0.3000 | 0.1340 | 0.3933 | 0.1372 | 0.3500 | 0.1615 | 0.2967 | 0.1373 | 0.3483 | 0.1626 | 0.3417 | 0.1409 | 0.3283 | 0.1195 |
| | BIC SF | 0.2167 | 0.0838 | 0.2200 | 0.0850 | 0.2217 | 0.0856 | 0.1867 | 0.0594 | 0.2133 | 0.0789 | 0.2133 | 0.0752 | 0.2050 | 0.0816 | 0.2067 | 0.0715 | 0.2017 | 0.0682 | 0.2167 | 0.0768 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0933 | 0.0831 | 0.1133 | 0.0850 | 0.1467 | 0.0544 | 0.2117 | 0.1205 | 0.1167 | 0.0803 | 0.1350 | 0.0657 | 0.1650 | 0.0690 | 0.0983 | 0.0824 | 0.1167 | 0.0768 | 0.1667 | 0.1059 |
| | E-net | 0.0933 | 0.0831 | 0.1167 | 0.0870 | 0.1483 | 0.0575 | 0.2800 | 0.1848 | 0.1167 | 0.0803 | 0.1367 | 0.0686 | 0.1917 | 0.0959 | 0.0983 | 0.0824 | 0.1167 | 0.0768 | 0.1933 | 0.1396 |
| | SCAD | 0.2900 | 0.1889 | 0.3083 | 0.2277 | 0.3017 | 0.2231 | 0.2617 | 0.1943 | 0.3233 | 0.2343 | 0.2967 | 0.1798 | 0.2517 | 0.1932 | 0.2850 | 0.2123 | 0.3000 | 0.1953 | 0.2700 | 0.1753 |
| | MCP | 0.2750 | 0.1973 | 0.2633 | 0.1985 | 0.2700 | 0.2116 | 0.2567 | 0.1795 | 0.2783 | 0.2052 | 0.2633 | 0.1927 | 0.2283 | 0.1601 | 0.2567 | 0.1988 | 0.2683 | 0.2023 | 0.2517 | 0.1716 |

Table 62: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 1000$ and $p = 100$. See Figure 62 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC F | 0.6150 | 0.1177 | 0.6067 | 0.1197 | 0.6133 | 0.1273 | 0.4150 | 0.1633 | 0.5967 | 0.1165 | 0.6117 | 0.1232 | 0.4533 | 0.1362 | 0.6250 | 0.1306 | 0.5900 | 0.1146 | 0.3933 | 0.1330 |
| | BIC F | 0.5117 | 0.0592 | 0.5167 | 0.0556 | 0.4433 | 0.0983 | 0.2300 | 0.0911 | 0.5017 | 0.0443 | 0.4767 | 0.0821 | 0.3283 | 0.0440 | 0.5100 | 0.0571 | 0.4567 | 0.0842 | 0.2583 | 0.1095 |
| | AIC SF | 0.6150 | 0.1177 | 0.6067 | 0.1197 | 0.6117 | 0.1255 | 0.4150 | 0.1633 | 0.5983 | 0.1163 | 0.6117 | 0.1232 | 0.4450 | 0.1341 | 0.6250 | 0.1306 | 0.5900 | 0.1096 | 0.3950 | 0.1354 |
| | BIC SF | 0.5117 | 0.0592 | 0.5167 | 0.0556 | 0.4433 | 0.0983 | 0.2300 | 0.0911 | 0.5017 | 0.0443 | 0.4767 | 0.0821 | 0.3283 | 0.0440 | 0.5100 | 0.0571 | 0.4567 | 0.0842 | 0.2583 | 0.1095 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.4533 | 0.1062 | 0.5183 | 0.0622 | 0.5300 | 0.0959 | 0.4183 | 0.1470 | 0.4883 | 0.0489 | 0.5100 | 0.0881 | 0.5367 | 0.1373 | 0.5117 | 0.0721 | 0.5400 | 0.0980 | 0.5267 | 0.1416 |
| | E-net | 0.4633 | 0.0905 | 0.5200 | 0.0639 | 0.5400 | 0.0921 | 0.4867 | 0.1492 | 0.4917 | 0.0435 | 0.5167 | 0.0870 | 0.6600 | 0.1400 | 0.5217 | 0.0843 | 0.5700 | 0.1141 | 0.6300 | 0.1599 |
| | SCAD | 0.5733 | 0.1168 | 0.5617 | 0.0875 | 0.5217 | 0.0843 | 0.2100 | 0.0874 | 0.5383 | 0.0780 | 0.5433 | 0.1127 | 0.3017 | 0.0775 | 0.5600 | 0.0963 | 0.5167 | 0.0991 | 0.2217 | 0.0978 |
| | MCP | 0.5250 | 0.0833 | 0.5333 | 0.0670 | 0.4650 | 0.1093 | 0.2033 | 0.0806 | 0.5200 | 0.0594 | 0.4850 | 0.1088 | 0.2950 | 0.0744 | 0.5217 | 0.0773 | 0.4783 | 0.0875 | 0.2233 | 0.0954 |
| 3 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC F | 0.4083 | 0.1714 | 0.3917 | 0.1596 | 0.3700 | 0.1813 | 0.3250 | 0.1505 | 0.4050 | 0.1594 | 0.4083 | 0.1389 | 0.3317 | 0.1650 | 0.4200 | 0.1700 | 0.3800 | 0.1573 | 0.3133 | 0.1387 |
| | BIC F | 0.2267 | 0.0871 | 0.2183 | 0.0877 | 0.1900 | 0.0581 | 0.1850 | 0.0524 | 0.2200 | 0.0944 | 0.2183 | 0.0810 | 0.2083 | 0.0799 | 0.2133 | 0.0789 | 0.2067 | 0.0790 | 0.1983 | 0.0657 |
| | AIC SF | 0.4083 | 0.1714 | 0.3883 | 0.1608 | 0.3700 | 0.1813 | 0.3250 | 0.1505 | 0.4017 | 0.1573 | 0.4083 | 0.1389 | 0.3200 | 0.1529 | 0.4167 | 0.1667 | 0.3800 | 0.1591 | 0.3117 | 0.1395 |
| | BIC SF | 0.2267 | 0.0871 | 0.2183 | 0.0877 | 0.1900 | 0.0581 | 0.1850 | 0.0524 | 0.2200 | 0.0944 | 0.2183 | 0.0810 | 0.2083 | 0.0799 | 0.2133 | 0.0789 | 0.2067 | 0.0790 | 0.1983 | 0.0657 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1683 | 0.0167 | 0.1717 | 0.0371 | 0.1883 | 0.0697 | 0.2183 | 0.0844 | 0.1767 | 0.0571 | 0.1800 | 0.0512 | 0.2683 | 0.1273 | 0.1767 | 0.0398 | 0.2033 | 0.0873 | 0.2717 | 0.1223 |
| | E-net | 0.1683 | 0.0167 | 0.1783 | 0.0489 | 0.2050 | 0.0882 | 0.2733 | 0.1197 | 0.1783 | 0.0592 | 0.1883 | 0.0611 | 0.3700 | 0.1668 | 0.1833 | 0.0556 | 0.2317 | 0.1108 | 0.4067 | 0.1647 |
| | SCAD | 0.2933 | 0.1300 | 0.3050 | 0.1403 | 0.2550 | 0.1195 | 0.1717 | 0.0286 | 0.2917 | 0.1560 | 0.2917 | 0.1505 | 0.1933 | 0.0776 | 0.3017 | 0.1415 | 0.2950 | 0.1438 | 0.1850 | 0.0524 |
| | MCP | 0.2383 | 0.1142 | 0.2633 | 0.1189 | 0.2017 | 0.0722 | 0.1700 | 0.0235 | 0.2483 | 0.1371 | 0.2150 | 0.0831 | 0.1783 | 0.0427 | 0.2500 | 0.1173 | 0.2200 | 0.0914 | 0.1833 | 0.0503 |
| 6 | OLS | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | AIC F | 0.3933 | 0.1392 | 0.3683 | 0.1522 | 0.3417 | 0.1409 | 0.3050 | 0.1554 | 0.3600 | 0.1493 | 0.3533 | 0.1427 | 0.3000 | 0.1381 | 0.3617 | 0.1403 | 0.3333 | 0.1479 | 0.2917 | 0.1327 |
| | BIC F | 0.2167 | 0.0803 | 0.2050 | 0.0705 | 0.1900 | 0.0581 | 0.1417 | 0.0725 | 0.2033 | 0.0733 | 0.2033 | 0.0733 | 0.2083 | 0.0799 | 0.2067 | 0.0754 | 0.1933 | 0.0614 | 0.1783 | 0.0638 |
| | AIC SF | 0.3900 | 0.1365 | 0.3683 | 0.1522 | 0.3433 | 0.1418 | 0.3017 | 0.1548 | 0.3600 | 0.1493 | 0.3517 | 0.1419 | 0.2967 | 0.1393 | 0.3633 | 0.1409 | 0.3317 | 0.1470 | 0.2917 | 0.1327 |
| | BIC SF | 0.2167 | 0.0803 | 0.2050 | 0.0705 | 0.1900 | 0.0581 | 0.1417 | 0.0725 | 0.2033 | 0.0733 | 0.2033 | 0.0733 | 0.2067 | 0.0754 | 0.2067 | 0.0754 | 0.1933 | 0.0614 | 0.1783 | 0.0638 |
| | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.0917 | 0.0866 | 0.1300 | 0.0771 | 0.1383 | 0.0672 | 0.1417 | 0.0898 | 0.1100 | 0.0793 | 0.1317 | 0.0722 | 0.1683 | 0.0902 | 0.1200 | 0.0857 | 0.1400 | 0.0739 | 0.1817 | 0.1008 |
| | E-net | 0.0900 | 0.0868 | 0.1300 | 0.0771 | 0.1433 | 0.0750 | 0.1600 | 0.0945 | 0.1100 | 0.0793 | 0.1317 | 0.0722 | 0.1850 | 0.1083 | 0.1200 | 0.0857 | 0.1400 | 0.0739 | 0.2083 | 0.1306 |
| | SCAD | 0.2200 | 0.0883 | 0.2267 | 0.0903 | 0.1950 | 0.0672 | 0.1450 | 0.0655 | 0.2217 | 0.1186 | 0.2067 | 0.0890 | 0.1833 | 0.0556 | 0.2250 | 0.1043 | 0.2117 | 0.0943 | 0.1817 | 0.0631 |
| | MCP | 0.1967 | 0.0686 | 0.2017 | 0.0796 | 0.1817 | 0.0479 | 0.1550 | 0.0592 | 0.1983 | 0.0908 | 0.1850 | 0.0622 | 0.1617 | 0.0602 | 0.2067 | 0.0858 | 0.1950 | 0.0672 | 0.1733 | 0.0576 |

Table 63: Mean and standard deviation of the $\beta$-sensitivity for the non-linear simulations when $n = 1000$ and $p = 2000$. See Figure 63 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.3900 | 0.1302 | 0.4850 | 0.0714 | 0.4367 | 0.1027 | 0.2517 | 0.1046 | 0.4650 | 0.0831 | 0.4800 | 0.0760 | 0.5500 | 0.1391 | 0.4983 | 0.0690 | 0.5183 | 0.0817 | 0.3967 | 0.1549 |
| | E-net | 0.4033 | 0.1258 | 0.4900 | 0.0619 | 0.4483 | 0.0996 | 0.2633 | 0.1141 | 0.4783 | 0.0736 | 0.4950 | 0.0766 | 0.6733 | 0.1274 | 0.5083 | 0.0598 | 0.5300 | 0.0834 | 0.4683 | 0.1601 |
| | SCAD | 0.4950 | 0.0647 | 0.5033 | 0.0626 | 0.4167 | 0.1073 | 0.1667 | 0.0000 | 0.5200 | 0.0682 | 0.4917 | 0.0763 | 0.1800 | 0.0454 | 0.5233 | 0.0671 | 0.4650 | 0.0896 | 0.1667 | 0.0000 |
| | MCP | 0.4767 | 0.0711 | 0.4917 | 0.0549 | 0.3550 | 0.1246 | 0.1667 | 0.0000 | 0.5067 | 0.0746 | 0.4400 | 0.0871 | 0.1800 | 0.0454 | 0.4883 | 0.0681 | 0.3950 | 0.1102 | 0.1667 | 0.0000 |
| 3 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1667 | 0.0000 | 0.1683 | 0.0167 | 0.1733 | 0.0328 | 0.1700 | 0.0235 | 0.1667 | 0.0000 | 0.1700 | 0.0235 | 0.2633 | 0.1280 | 0.1717 | 0.0286 | 0.1850 | 0.0524 | 0.2200 | 0.1002 |
| | E-net | 0.1667 | 0.0000 | 0.1683 | 0.0167 | 0.1817 | 0.0479 | 0.1750 | 0.0365 | 0.1667 | 0.0000 | 0.1700 | 0.0235 | 0.3983 | 0.1551 | 0.1717 | 0.0286 | 0.2017 | 0.0682 | 0.2950 | 0.1418 |
| | SCAD | 0.1883 | 0.0563 | 0.2033 | 0.0733 | 0.1867 | 0.0544 | 0.1667 | 0.0000 | 0.2167 | 0.0838 | 0.2133 | 0.0857 | 0.1967 | 0.0726 | 0.2300 | 0.1080 | 0.2167 | 0.0768 | 0.1750 | 0.0435 |
| | MCP | 0.1850 | 0.0524 | 0.1817 | 0.0479 | 0.1767 | 0.0398 | 0.1667 | 0.0000 | 0.1950 | 0.0672 | 0.1950 | 0.0672 | 0.1733 | 0.0328 | 0.1983 | 0.0699 | 0.1817 | 0.0479 | 0.1717 | 0.0286 |
| 6 | Ridge | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 | 1.0000 | 0.0000 |
| | Lasso | 0.1050 | 0.0809 | 0.1100 | 0.0793 | 0.1317 | 0.0760 | 0.1200 | 0.0752 | 0.1167 | 0.0768 | 0.1017 | 0.0817 | 0.1567 | 0.0881 | 0.1233 | 0.0735 | 0.1350 | 0.0699 | 0.1550 | 0.1012 |
| | E-net | 0.1033 | 0.0813 | 0.1083 | 0.0799 | 0.1300 | 0.0771 | 0.1267 | 0.0715 | 0.1150 | 0.0775 | 0.1000 | 0.0821 | 0.1783 | 0.1142 | 0.1217 | 0.0744 | 0.1350 | 0.0738 | 0.1733 | 0.1134 |
| | SCAD | 0.1850 | 0.0524 | 0.1850 | 0.0524 | 0.1867 | 0.0544 | 0.1400 | 0.0658 | 0.1967 | 0.0644 | 0.2000 | 0.0749 | 0.1750 | 0.0435 | 0.1967 | 0.0726 | 0.1750 | 0.0365 | 0.1550 | 0.0427 |
| | MCP | 0.1750 | 0.0365 | 0.1783 | 0.0427 | 0.1733 | 0.0328 | 0.1167 | 0.0768 | 0.1883 | 0.0563 | 0.1850 | 0.0524 | 0.1617 | 0.0440 | 0.1817 | 0.0479 | 0.1717 | 0.0286 | 0.1500 | 0.0503 |

## 5.4 Tables for the $\beta$-specificity of the non-linear simulations

Table 64: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 50$ and $p = 10$. See Figure 64 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.412 | 0.1472 | 0.408 | 0.1656 | 0.428 | 0.1505 | 0.486 | 0.1664 | 0.398 | 0.1670 | 0.428 | 0.1558 | 0.458 | 0.1713 | 0.382 | 0.1708 | 0.432 | 0.1497 | 0.466 | 0.1609 |
| | BIC B | 0.506 | 0.1081 | 0.500 | 0.1255 | 0.518 | 0.1104 | 0.590 | 0.1314 | 0.496 | 0.1255 | 0.526 | 0.1125 | 0.546 | 0.1417 | 0.508 | 0.1220 | 0.514 | 0.1279 | 0.566 | 0.1241 |
| | AIC SB | 0.412 | 0.1472 | 0.408 | 0.1656 | 0.428 | 0.1505 | 0.486 | 0.1664 | 0.398 | 0.1670 | 0.428 | 0.1558 | 0.458 | 0.1713 | 0.382 | 0.1708 | 0.432 | 0.1497 | 0.464 | 0.1605 |
| | BIC SB | 0.506 | 0.1081 | 0.498 | 0.1255 | 0.518 | 0.1104 | 0.590 | 0.1314 | 0.496 | 0.1255 | 0.526 | 0.1125 | 0.546 | 0.1417 | 0.512 | 0.1183 | 0.514 | 0.1279 | 0.566 | 0.1241 |
| | AIC F | 0.416 | 0.1441 | 0.440 | 0.1477 | 0.444 | 0.1493 | 0.528 | 0.1621 | 0.404 | 0.1705 | 0.466 | 0.1335 | 0.480 | 0.1504 | 0.392 | 0.1606 | 0.460 | 0.1435 | 0.488 | 0.1665 |
| | BIC F | 0.512 | 0.1076 | 0.514 | 0.1247 | 0.522 | 0.1060 | 0.606 | 0.1153 | 0.504 | 0.1222 | 0.542 | 0.0997 | 0.544 | 0.1209 | 0.524 | 0.1093 | 0.538 | 0.1013 | 0.572 | 0.1102 |
| | AIC SF | 0.416 | 0.1441 | 0.440 | 0.1477 | 0.448 | 0.1453 | 0.528 | 0.1621 | 0.406 | 0.1693 | 0.468 | 0.1309 | 0.504 | 0.1406 | 0.394 | 0.1594 | 0.460 | 0.1435 | 0.508 | 0.1433 |
| | BIC SF | 0.512 | 0.1076 | 0.514 | 0.1247 | 0.522 | 0.1060 | 0.606 | 0.1153 | 0.504 | 0.1222 | 0.542 | 0.0997 | 0.562 | 0.1126 | 0.524 | 0.1093 | 0.538 | 0.1013 | 0.586 | 0.0995 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.512 | 0.1249 | 0.476 | 0.1525 | 0.430 | 0.1541 | 0.412 | 0.1552 | 0.490 | 0.1432 | 0.478 | 0.1418 | 0.420 | 0.1717 | 0.476 | 0.1628 | 0.454 | 0.1629 | 0.428 | 0.1682 |
| | E-net | 0.500 | 0.1348 | 0.462 | 0.1575 | 0.396 | 0.1504 | 0.324 | 0.1628 | 0.476 | 0.1498 | 0.460 | 0.1435 | 0.352 | 0.1611 | 0.464 | 0.1630 | 0.434 | 0.1609 | 0.372 | 0.1776 |
| | SCAD | 0.410 | 0.1872 | 0.424 | 0.1870 | 0.434 | 0.1908 | 0.548 | 0.2082 | 0.416 | 0.1879 | 0.478 | 0.1727 | 0.492 | 0.1830 | 0.416 | 0.2063 | 0.496 | 0.1595 | 0.472 | 0.2118 |
| | MCP | 0.450 | 0.1829 | 0.496 | 0.1669 | 0.474 | 0.1790 | 0.542 | 0.1996 | 0.460 | 0.1959 | 0.512 | 0.1641 | 0.470 | 0.1829 | 0.464 | 0.2087 | 0.524 | 0.1525 | 0.512 | 0.1849 |
| 3 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.500 | 0.2118 | 0.524 | 0.1881 | 0.546 | 0.1702 | 0.598 | 0.1645 | 0.538 | 0.1857 | 0.560 | 0.1886 | 0.550 | 0.1977 | 0.572 | 0.1753 | 0.542 | 0.1827 | 0.582 | 0.1559 |
| | BIC B | 0.658 | 0.1512 | 0.634 | 0.1609 | 0.656 | 0.1479 | 0.702 | 0.1223 | 0.686 | 0.1429 | 0.694 | 0.1286 | 0.666 | 0.1241 | 0.682 | 0.1306 | 0.658 | 0.1590 | 0.668 | 0.1278 |
| | AIC SB | 0.498 | 0.2118 | 0.524 | 0.1881 | 0.546 | 0.1702 | 0.598 | 0.1645 | 0.538 | 0.1857 | 0.558 | 0.1913 | 0.548 | 0.2002 | 0.570 | 0.1761 | 0.538 | 0.1813 | 0.582 | 0.1559 |
| | BIC SB | 0.658 | 0.1512 | 0.634 | 0.1609 | 0.652 | 0.1494 | 0.700 | 0.1223 | 0.690 | 0.1403 | 0.690 | 0.1314 | 0.666 | 0.1273 | 0.682 | 0.1306 | 0.658 | 0.1590 | 0.668 | 0.1278 |
| | AIC F | 0.532 | 0.1825 | 0.554 | 0.1839 | 0.574 | 0.1721 | 0.648 | 0.1396 | 0.564 | 0.1761 | 0.584 | 0.1900 | 0.606 | 0.1830 | 0.596 | 0.1752 | 0.584 | 0.1600 | 0.660 | 0.1463 |
| | BIC F | 0.666 | 0.1423 | 0.648 | 0.1480 | 0.672 | 0.1464 | 0.730 | 0.1040 | 0.696 | 0.1286 | 0.710 | 0.1185 | 0.688 | 0.1217 | 0.696 | 0.1222 | 0.692 | 0.1346 | 0.706 | 0.1188 |
| | AIC SF | 0.532 | 0.1825 | 0.554 | 0.1839 | 0.574 | 0.1721 | 0.648 | 0.1396 | 0.566 | 0.1754 | 0.588 | 0.1860 | 0.620 | 0.1853 | 0.598 | 0.1717 | 0.584 | 0.1600 | 0.662 | 0.1469 |
| | BIC SF | 0.666 | 0.1423 | 0.648 | 0.1480 | 0.676 | 0.1415 | 0.730 | 0.1040 | 0.696 | 0.1286 | 0.710 | 0.1185 | 0.700 | 0.1155 | 0.696 | 0.1222 | 0.694 | 0.1317 | 0.706 | 0.1188 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.752 | 0.1396 | 0.756 | 0.1085 | 0.666 | 0.1683 | 0.656 | 0.1800 | 0.784 | 0.0615 | 0.768 | 0.0931 | 0.670 | 0.1567 | 0.766 | 0.0807 | 0.734 | 0.1506 | 0.710 | 0.1541 |
| | E-net | 0.752 | 0.1396 | 0.746 | 0.1201 | 0.654 | 0.1749 | 0.574 | 0.2121 | 0.780 | 0.0667 | 0.766 | 0.0987 | 0.616 | 0.1813 | 0.764 | 0.0871 | 0.728 | 0.1544 | 0.684 | 0.1686 |
| | SCAD | 0.540 | 0.2535 | 0.548 | 0.2584 | 0.536 | 0.2460 | 0.634 | 0.2345 | 0.590 | 0.2153 | 0.576 | 0.2332 | 0.602 | 0.2265 | 0.608 | 0.1968 | 0.536 | 0.2393 | 0.644 | 0.2022 |
| | MCP | 0.590 | 0.2627 | 0.580 | 0.2629 | 0.610 | 0.2468 | 0.626 | 0.2321 | 0.656 | 0.2071 | 0.642 | 0.2226 | 0.594 | 0.2317 | 0.664 | 0.1795 | 0.598 | 0.2486 | 0.662 | 0.2004 |
| 6 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.594 | 0.1979 | 0.578 | 0.1883 | 0.590 | 0.1691 | 0.590 | 0.1829 | 0.612 | 0.1725 | 0.634 | 0.1799 | 0.570 | 0.1936 | 0.644 | 0.1623 | 0.584 | 0.1791 | 0.590 | 0.1617 |
| | BIC B | 0.720 | 0.1271 | 0.706 | 0.1347 | 0.700 | 0.1287 | 0.700 | 0.1318 | 0.740 | 0.1223 | 0.732 | 0.1246 | 0.690 | 0.1432 | 0.744 | 0.0988 | 0.706 | 0.1347 | 0.688 | 0.1402 |
| | AIC SB | 0.594 | 0.1979 | 0.578 | 0.1883 | 0.588 | 0.1677 | 0.590 | 0.1829 | 0.612 | 0.1725 | 0.634 | 0.1821 | 0.568 | 0.1943 | 0.642 | 0.1615 | 0.584 | 0.1791 | 0.588 | 0.1629 |
| | BIC SB | 0.720 | 0.1271 | 0.706 | 0.1347 | 0.700 | 0.1287 | 0.700 | 0.1318 | 0.740 | 0.1223 | 0.730 | 0.1283 | 0.690 | 0.1432 | 0.744 | 0.0988 | 0.704 | 0.1348 | 0.686 | 0.1400 |
| | AIC F | 0.620 | 0.1853 | 0.614 | 0.1688 | 0.620 | 0.1764 | 0.662 | 0.1674 | 0.624 | 0.1615 | 0.664 | 0.1703 | 0.654 | 0.1500 | 0.676 | 0.1357 | 0.642 | 0.1615 | 0.626 | 0.1574 |
| | BIC F | 0.734 | 0.1174 | 0.722 | 0.1133 | 0.734 | 0.1066 | 0.738 | 0.1013 | 0.750 | 0.1115 | 0.750 | 0.0959 | 0.724 | 0.1129 | 0.748 | 0.0926 | 0.738 | 0.1013 | 0.714 | 0.1215 |
| | AIC SF | 0.622 | 0.1840 | 0.616 | 0.1674 | 0.622 | 0.1750 | 0.664 | 0.1630 | 0.622 | 0.1630 | 0.666 | 0.1683 | 0.658 | 0.1458 | 0.678 | 0.1330 | 0.646 | 0.1553 | 0.628 | 0.1558 |
| | BIC SF | 0.734 | 0.1174 | 0.722 | 0.1133 | 0.734 | 0.1066 | 0.740 | 0.0964 | 0.750 | 0.1115 | 0.750 | 0.0959 | 0.726 | 0.1088 | 0.748 | 0.0926 | 0.738 | 0.1013 | 0.714 | 0.1215 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.794 | 0.0445 | 0.796 | 0.0281 | 0.778 | 0.0746 | 0.762 | 0.0930 | 0.798 | 0.0200 | 0.798 | 0.0200 | 0.756 | 0.1085 | 0.798 | 0.0200 | 0.788 | 0.0477 | 0.778 | 0.0799 |
| | E-net | 0.794 | 0.0445 | 0.796 | 0.0281 | 0.778 | 0.0746 | 0.740 | 0.1318 | 0.798 | 0.0200 | 0.796 | 0.0281 | 0.742 | 0.1281 | 0.798 | 0.0200 | 0.792 | 0.0394 | 0.772 | 0.0944 |
| | SCAD | 0.640 | 0.2395 | 0.640 | 0.2494 | 0.612 | 0.2341 | 0.694 | 0.1958 | 0.684 | 0.1710 | 0.688 | 0.1849 | 0.670 | 0.1957 | 0.734 | 0.1304 | 0.634 | 0.2413 | 0.660 | 0.2040 |
| | MCP | 0.678 | 0.2290 | 0.668 | 0.2465 | 0.642 | 0.2383 | 0.690 | 0.1850 | 0.722 | 0.1630 | 0.726 | 0.1599 | 0.694 | 0.1808 | 0.746 | 0.1201 | 0.666 | 0.2328 | 0.688 | 0.1996 |

Table 65: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 50$ and $p = 100$. See Figure 65 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9598 | 0.0430 | 0.9418 | 0.0409 | 0.9181 | 0.0427 | 0.9151 | 0.0302 | 0.9639 | 0.0279 | 0.9627 | 0.0284 | 0.9657 | 0.0159 | 0.9592 | 0.0216 | 0.9491 | 0.0263 | 0.9438 | 0.0221 |
| | E-net | 0.9571 | 0.0455 | 0.9338 | 0.0406 | 0.9009 | 0.0476 | 0.8793 | 0.0312 | 0.9604 | 0.0311 | 0.9591 | 0.0293 | 0.9612 | 0.0162 | 0.9547 | 0.0232 | 0.9413 | 0.0271 | 0.9240 | 0.0220 |
| | SCAD | 0.9241 | 0.0358 | 0.9226 | 0.0379 | 0.9457 | 0.0272 | 0.9641 | 0.0301 | 0.9295 | 0.0368 | 0.9321 | 0.0411 | 0.9486 | 0.0266 | 0.9273 | 0.0377 | 0.9424 | 0.0319 | 0.9625 | 0.0210 |
| | MCP | 0.9591 | 0.0216 | 0.9588 | 0.0231 | 0.9669 | 0.0177 | 0.9743 | 0.0108 | 0.9621 | 0.0208 | 0.9639 | 0.0193 | 0.9653 | 0.0178 | 0.9578 | 0.0236 | 0.9646 | 0.0163 | 0.9700 | 0.0163 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9858 | 0.0114 | 0.9823 | 0.0190 | 0.9724 | 0.0228 | 0.9578 | 0.0267 | 0.9847 | 0.0170 | 0.9851 | 0.0154 | 0.9800 | 0.0248 | 0.9831 | 0.0190 | 0.9787 | 0.0183 | 0.9714 | 0.0198 |
| | E-net | 0.9852 | 0.0140 | 0.9802 | 0.0215 | 0.9661 | 0.0292 | 0.9385 | 0.0368 | 0.9836 | 0.0212 | 0.9845 | 0.0170 | 0.9762 | 0.0285 | 0.9826 | 0.0154 | 0.9768 | 0.0186 | 0.9606 | 0.0254 |
| | SCAD | 0.9361 | 0.0434 | 0.9365 | 0.0391 | 0.9493 | 0.0278 | 0.9680 | 0.0226 | 0.9415 | 0.0478 | 0.9412 | 0.0364 | 0.9638 | 0.0249 | 0.9386 | 0.0413 | 0.9529 | 0.0295 | 0.9671 | 0.0188 |
| | MCP | 0.9672 | 0.0254 | 0.9662 | 0.0282 | 0.9769 | 0.0140 | 0.9795 | 0.0123 | 0.9739 | 0.0204 | 0.9734 | 0.0210 | 0.9762 | 0.0193 | 0.9709 | 0.0214 | 0.9723 | 0.0219 | 0.9766 | 0.0142 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9871 | 0.0152 | 0.9837 | 0.0335 | 0.9848 | 0.0137 | 0.9805 | 0.0151 | 0.9873 | 0.0211 | 0.9865 | 0.0162 | 0.9847 | 0.0236 | 0.9868 | 0.0193 | 0.9882 | 0.0066 | 0.9851 | 0.0111 |
| | E-net | 0.9871 | 0.0152 | 0.9839 | 0.0290 | 0.9840 | 0.0154 | 0.9742 | 0.0249 | 0.9872 | 0.0211 | 0.9857 | 0.0184 | 0.9841 | 0.0247 | 0.9867 | 0.0203 | 0.9881 | 0.0074 | 0.9828 | 0.0157 |
| | SCAD | 0.9636 | 0.0389 | 0.9613 | 0.0357 | 0.9648 | 0.0268 | 0.9734 | 0.0182 | 0.9633 | 0.0385 | 0.9617 | 0.0359 | 0.9715 | 0.0286 | 0.9602 | 0.0381 | 0.9671 | 0.0279 | 0.9719 | 0.0238 |
| | MCP | 0.9758 | 0.0235 | 0.9761 | 0.0209 | 0.9798 | 0.0137 | 0.9819 | 0.0108 | 0.9793 | 0.0177 | 0.9773 | 0.0176 | 0.9818 | 0.0159 | 0.9797 | 0.0158 | 0.9792 | 0.0160 | 0.9803 | 0.0149 |

Table 66: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 50$ and $p = 2000$. See Figure 66 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9980 | 0.0024 | 0.9959 | 0.0027 | 0.9929 | 0.0028 | 0.9931 | 0.0020 | 0.9976 | 0.0025 | 0.9981 | 0.0018 | 0.9981 | 0.0012 | 0.9979 | 0.0017 | 0.9965 | 0.0020 | 0.9962 | 0.0017 |
| | E-net | 0.9978 | 0.0029 | 0.9951 | 0.0029 | 0.9911 | 0.0028 | 0.9894 | 0.0024 | 0.9974 | 0.0027 | 0.9979 | 0.0021 | 0.9977 | 0.0014 | 0.9974 | 0.0021 | 0.9958 | 0.0021 | 0.9942 | 0.0018 |
| | SCAD | 0.9918 | 0.0035 | 0.9929 | 0.0026 | 0.9941 | 0.0028 | 0.9960 | 0.0030 | 0.9916 | 0.0028 | 0.9921 | 0.0033 | 0.9952 | 0.0034 | 0.9927 | 0.0032 | 0.9944 | 0.0030 | 0.9976 | 0.0020 |
| | MCP | 0.9973 | 0.0014 | 0.9977 | 0.0012 | 0.9981 | 0.0008 | 0.9988 | 0.0004 | 0.9974 | 0.0013 | 0.9977 | 0.0012 | 0.9981 | 0.0014 | 0.9976 | 0.0012 | 0.9979 | 0.0012 | 0.9988 | 0.0009 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9993 | 0.0006 | 0.9985 | 0.0025 | 0.9978 | 0.0021 | 0.9970 | 0.0020 | 0.9994 | 0.0004 | 0.9991 | 0.0020 | 0.9991 | 0.0010 | 0.9992 | 0.0013 | 0.9983 | 0.0023 | 0.9982 | 0.0011 |
| | E-net | 0.9993 | 0.0009 | 0.9983 | 0.0027 | 0.9973 | 0.0023 | 0.9949 | 0.0032 | 0.9993 | 0.0005 | 0.9990 | 0.0023 | 0.9989 | 0.0013 | 0.9991 | 0.0015 | 0.9980 | 0.0026 | 0.9972 | 0.0019 |
| | SCAD | 0.9939 | 0.0042 | 0.9935 | 0.0033 | 0.9952 | 0.0023 | 0.9972 | 0.0022 | 0.9934 | 0.0044 | 0.9945 | 0.0042 | 0.9951 | 0.0039 | 0.9946 | 0.0039 | 0.9950 | 0.0030 | 0.9971 | 0.0021 |
| | MCP | 0.9984 | 0.0011 | 0.9980 | 0.0013 | 0.9986 | 0.0009 | 0.9990 | 0.0004 | 0.9982 | 0.0014 | 0.9985 | 0.0013 | 0.9984 | 0.0014 | 0.9984 | 0.0013 | 0.9985 | 0.0010 | 0.9986 | 0.0012 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9994 | 0.0006 | 0.9994 | 0.0005 | 0.9990 | 0.0015 | 0.9989 | 0.0012 | 0.9995 | 0.0001 | 0.9993 | 0.0016 | 0.9993 | 0.0010 | 0.9995 | 0.0002 | 0.9991 | 0.0017 | 0.9991 | 0.0007 |
| | E-net | 0.9994 | 0.0007 | 0.9994 | 0.0006 | 0.9989 | 0.0016 | 0.9984 | 0.0021 | 0.9995 | 0.0001 | 0.9993 | 0.0015 | 0.9993 | 0.0011 | 0.9995 | 0.0002 | 0.9990 | 0.0019 | 0.9989 | 0.0012 |
| | SCAD | 0.9971 | 0.0034 | 0.9958 | 0.0039 | 0.9965 | 0.0027 | 0.9981 | 0.0015 | 0.9966 | 0.0038 | 0.9971 | 0.0037 | 0.9975 | 0.0028 | 0.9967 | 0.0038 | 0.9969 | 0.0032 | 0.9977 | 0.0021 |
| | MCP | 0.9988 | 0.0011 | 0.9985 | 0.0014 | 0.9989 | 0.0008 | 0.9991 | 0.0004 | 0.9987 | 0.0014 | 0.9989 | 0.0010 | 0.9989 | 0.0010 | 0.9988 | 0.0013 | 0.9989 | 0.0009 | 0.9987 | 0.0014 |

Table 67: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 200$ and $p = 10$. See Figure 67 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.348 | 0.1159 | 0.368 | 0.1053 | 0.394 | 0.1462 | 0.452 | 0.1494 | 0.358 | 0.1249 | 0.372 | 0.1364 | 0.436 | 0.1514 | 0.358 | 0.1281 | 0.368 | 0.1355 | 0.454 | 0.1417 |
| | BIC B | 0.450 | 0.1000 | 0.454 | 0.1058 | 0.480 | 0.1137 | 0.556 | 0.0833 | 0.474 | 0.0970 | 0.472 | 0.1190 | 0.540 | 0.1119 | 0.466 | 0.1066 | 0.480 | 0.1137 | 0.562 | 0.0930 |
| | AIC SB | 0.348 | 0.1159 | 0.368 | 0.1053 | 0.394 | 0.1462 | 0.452 | 0.1494 | 0.358 | 0.1249 | 0.372 | 0.1364 | 0.434 | 0.1532 | 0.358 | 0.1281 | 0.368 | 0.1355 | 0.454 | 0.1417 |
| | BIC SB | 0.450 | 0.1000 | 0.454 | 0.1058 | 0.480 | 0.1137 | 0.556 | 0.0833 | 0.474 | 0.0970 | 0.472 | 0.1190 | 0.540 | 0.1119 | 0.466 | 0.1066 | 0.480 | 0.1137 | 0.562 | 0.0930 |
| | AIC F | 0.348 | 0.1087 | 0.368 | 0.1053 | 0.400 | 0.1449 | 0.472 | 0.1436 | 0.362 | 0.1196 | 0.382 | 0.1306 | 0.456 | 0.1395 | 0.360 | 0.1271 | 0.380 | 0.1318 | 0.470 | 0.1403 |
| | BIC F | 0.450 | 0.1000 | 0.454 | 0.1058 | 0.486 | 0.1146 | 0.562 | 0.0789 | 0.474 | 0.0970 | 0.480 | 0.1101 | 0.548 | 0.1010 | 0.470 | 0.1078 | 0.494 | 0.1081 | 0.562 | 0.0885 |
| | AIC SF | 0.348 | 0.1087 | 0.368 | 0.1053 | 0.400 | 0.1449 | 0.472 | 0.1436 | 0.362 | 0.1196 | 0.382 | 0.1306 | 0.456 | 0.1395 | 0.360 | 0.1271 | 0.382 | 0.1306 | 0.472 | 0.1379 |
| | BIC SF | 0.450 | 0.1000 | 0.454 | 0.1058 | 0.486 | 0.1146 | 0.562 | 0.0789 | 0.474 | 0.0970 | 0.480 | 0.1101 | 0.550 | 0.1000 | 0.470 | 0.1078 | 0.494 | 0.1081 | 0.564 | 0.0871 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.480 | 0.1239 | 0.418 | 0.1140 | 0.370 | 0.1642 | 0.378 | 0.1554 | 0.460 | 0.1255 | 0.440 | 0.0985 | 0.386 | 0.1457 | 0.466 | 0.1273 | 0.426 | 0.1383 | 0.388 | 0.1578 |
| | E-net | 0.456 | 0.1242 | 0.396 | 0.1063 | 0.338 | 0.1625 | 0.282 | 0.1533 | 0.452 | 0.1259 | 0.434 | 0.0945 | 0.310 | 0.1251 | 0.448 | 0.1210 | 0.394 | 0.1377 | 0.276 | 0.1793 |
| | SCAD | 0.266 | 0.1950 | 0.284 | 0.1994 | 0.346 | 0.2086 | 0.500 | 0.1741 | 0.294 | 0.1958 | 0.336 | 0.1773 | 0.502 | 0.1595 | 0.294 | 0.1979 | 0.322 | 0.2008 | 0.482 | 0.1930 |
| | MCP | 0.306 | 0.1999 | 0.328 | 0.2021 | 0.376 | 0.2036 | 0.508 | 0.1643 | 0.324 | 0.1985 | 0.376 | 0.1975 | 0.486 | 0.1589 | 0.334 | 0.2071 | 0.358 | 0.2189 | 0.496 | 0.1809 |
| 3 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.428 | 0.1364 | 0.452 | 0.1521 | 0.480 | 0.1633 | 0.588 | 0.1677 | 0.412 | 0.1653 | 0.464 | 0.1554 | 0.580 | 0.2020 | 0.432 | 0.1497 | 0.474 | 0.1468 | 0.562 | 0.1698 |
| | BIC B | 0.608 | 0.1447 | 0.586 | 0.1279 | 0.628 | 0.1393 | 0.708 | 0.1152 | 0.626 | 0.1411 | 0.642 | 0.1281 | 0.720 | 0.1239 | 0.596 | 0.1333 | 0.622 | 0.0980 | 0.656 | 0.1104 |
| | AIC SB | 0.428 | 0.1364 | 0.452 | 0.1521 | 0.480 | 0.1633 | 0.588 | 0.1677 | 0.412 | 0.1653 | 0.464 | 0.1554 | 0.580 | 0.2020 | 0.432 | 0.1497 | 0.474 | 0.1468 | 0.562 | 0.1698 |
| | BIC SB | 0.608 | 0.1447 | 0.586 | 0.1279 | 0.628 | 0.1393 | 0.708 | 0.1152 | 0.626 | 0.1411 | 0.642 | 0.1281 | 0.718 | 0.1242 | 0.596 | 0.1333 | 0.622 | 0.0980 | 0.656 | 0.1104 |
| | AIC F | 0.432 | 0.1355 | 0.454 | 0.1527 | 0.496 | 0.1669 | 0.614 | 0.1589 | 0.432 | 0.1746 | 0.494 | 0.1644 | 0.654 | 0.1604 | 0.432 | 0.1497 | 0.498 | 0.1318 | 0.586 | 0.1664 |
| | BIC F | 0.616 | 0.1383 | 0.588 | 0.1266 | 0.640 | 0.1172 | 0.720 | 0.1101 | 0.636 | 0.1345 | 0.650 | 0.1251 | 0.732 | 0.1145 | 0.598 | 0.1318 | 0.626 | 0.1011 | 0.664 | 0.1133 |
| | AIC SF | 0.432 | 0.1355 | 0.454 | 0.1527 | 0.496 | 0.1669 | 0.614 | 0.1589 | 0.432 | 0.1746 | 0.494 | 0.1644 | 0.658 | 0.1539 | 0.432 | 0.1497 | 0.498 | 0.1318 | 0.586 | 0.1664 |
| | BIC SF | 0.616 | 0.1383 | 0.588 | 0.1266 | 0.640 | 0.1172 | 0.720 | 0.1101 | 0.636 | 0.1345 | 0.650 | 0.1251 | 0.738 | 0.1090 | 0.598 | 0.1318 | 0.626 | 0.1011 | 0.664 | 0.1133 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.762 | 0.0930 | 0.720 | 0.1363 | 0.654 | 0.1553 | 0.614 | 0.1735 | 0.774 | 0.0787 | 0.740 | 0.1287 | 0.658 | 0.1565 | 0.774 | 0.0733 | 0.746 | 0.1096 | 0.690 | 0.1432 |
| | E-net | 0.760 | 0.0943 | 0.682 | 0.1533 | 0.618 | 0.1777 | 0.472 | 0.1832 | 0.770 | 0.0823 | 0.732 | 0.1340 | 0.562 | 0.1698 | 0.762 | 0.0930 | 0.740 | 0.1189 | 0.642 | 0.1689 |
| | SCAD | 0.492 | 0.2549 | 0.426 | 0.2338 | 0.516 | 0.2415 | 0.676 | 0.1965 | 0.466 | 0.2801 | 0.560 | 0.2238 | 0.648 | 0.2380 | 0.466 | 0.2221 | 0.492 | 0.2097 | 0.582 | 0.2091 |
| | MCP | 0.542 | 0.2531 | 0.478 | 0.2308 | 0.564 | 0.2402 | 0.664 | 0.2028 | 0.496 | 0.2835 | 0.610 | 0.2209 | 0.636 | 0.2351 | 0.518 | 0.2311 | 0.552 | 0.2110 | 0.626 | 0.1900 |
| 6 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.616 | 0.1674 | 0.620 | 0.1595 | 0.602 | 0.1764 | 0.634 | 0.1584 | 0.616 | 0.1698 | 0.616 | 0.1600 | 0.616 | 0.1879 | 0.604 | 0.1608 | 0.632 | 0.1442 | 0.602 | 0.1717 |
| | BIC B | 0.748 | 0.0926 | 0.748 | 0.0926 | 0.750 | 0.0916 | 0.734 | 0.0987 | 0.760 | 0.0804 | 0.766 | 0.0755 | 0.740 | 0.1155 | 0.744 | 0.0988 | 0.750 | 0.0916 | 0.724 | 0.1296 |
| | AIC SB | 0.616 | 0.1674 | 0.620 | 0.1595 | 0.602 | 0.1764 | 0.634 | 0.1584 | 0.612 | 0.1701 | 0.616 | 0.1600 | 0.616 | 0.1879 | 0.604 | 0.1608 | 0.632 | 0.1442 | 0.602 | 0.1717 |
| | BIC SB | 0.748 | 0.0926 | 0.748 | 0.0926 | 0.750 | 0.0916 | 0.734 | 0.0987 | 0.760 | 0.0804 | 0.766 | 0.0755 | 0.740 | 0.1155 | 0.744 | 0.0988 | 0.750 | 0.0916 | 0.724 | 0.1296 |
| | AIC F | 0.618 | 0.1660 | 0.624 | 0.1538 | 0.624 | 0.1712 | 0.654 | 0.1500 | 0.614 | 0.1712 | 0.642 | 0.1565 | 0.672 | 0.1596 | 0.612 | 0.1578 | 0.658 | 0.1372 | 0.648 | 0.1507 |
| | BIC F | 0.748 | 0.0926 | 0.752 | 0.0858 | 0.754 | 0.0892 | 0.740 | 0.0921 | 0.762 | 0.0789 | 0.772 | 0.0697 | 0.750 | 0.0959 | 0.746 | 0.0979 | 0.756 | 0.0833 | 0.736 | 0.1097 |
| | AIC SF | 0.618 | 0.1660 | 0.624 | 0.1538 | 0.624 | 0.1712 | 0.654 | 0.1500 | 0.614 | 0.1712 | 0.644 | 0.1520 | 0.680 | 0.1477 | 0.612 | 0.1578 | 0.658 | 0.1372 | 0.650 | 0.1460 |
| | BIC SF | 0.748 | 0.0926 | 0.752 | 0.0858 | 0.754 | 0.0892 | 0.740 | 0.0921 | 0.762 | 0.0789 | 0.772 | 0.0697 | 0.750 | 0.0959 | 0.746 | 0.0979 | 0.756 | 0.0833 | 0.736 | 0.1097 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.798 | 0.0200 | 0.800 | 0.0000 | 0.786 | 0.0652 | 0.758 | 0.0997 | 0.800 | 0.0000 | 0.794 | 0.0343 | 0.770 | 0.0772 | 0.800 | 0.0000 | 0.796 | 0.0400 | 0.790 | 0.0522 |
| | E-net | 0.798 | 0.0200 | 0.800 | 0.0000 | 0.784 | 0.0677 | 0.732 | 0.1340 | 0.800 | 0.0000 | 0.792 | 0.0394 | 0.754 | 0.1019 | 0.800 | 0.0000 | 0.796 | 0.0400 | 0.784 | 0.0735 |
| | SCAD | 0.612 | 0.2306 | 0.580 | 0.2370 | 0.624 | 0.2243 | 0.652 | 0.2082 | 0.624 | 0.2114 | 0.632 | 0.2197 | 0.668 | 0.2014 | 0.576 | 0.2483 | 0.646 | 0.1904 | 0.662 | 0.1984 |
| | MCP | 0.674 | 0.2232 | 0.644 | 0.2267 | 0.648 | 0.2544 | 0.672 | 0.1875 | 0.678 | 0.1926 | 0.686 | 0.2261 | 0.668 | 0.2150 | 0.630 | 0.2580 | 0.688 | 0.1783 | 0.688 | 0.1783 |

Table 68: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 200$ and $p = 100$. See Figure 68 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.7469 | 0.0585 | 0.7458 | 0.0646 | 0.7442 | 0.0611 | 0.7608 | 0.0620 | 0.7596 | 0.0636 | 0.7777 | 0.0675 | 0.8578 | 0.0631 | 0.7524 | 0.0691 | 0.7621 | 0.0750 | 0.8635 | 0.0707 |
| | BIC F | 0.9434 | 0.0196 | 0.9476 | 0.0174 | 0.9526 | 0.0180 | 0.9606 | 0.0165 | 0.9472 | 0.0193 | 0.9526 | 0.0166 | 0.9704 | 0.0116 | 0.9493 | 0.0185 | 0.9586 | 0.0169 | 0.9682 | 0.0111 |
| | AIC SF | 0.7496 | 0.0589 | 0.7485 | 0.0625 | 0.7518 | 0.0586 | 0.7651 | 0.0632 | 0.7614 | 0.0594 | 0.7833 | 0.0613 | 0.8657 | 0.0562 | 0.7620 | 0.0650 | 0.7712 | 0.0686 | 0.8655 | 0.0672 |
| | BIC SF | 0.9438 | 0.0191 | 0.9476 | 0.0174 | 0.9528 | 0.0175 | 0.9606 | 0.0165 | 0.9472 | 0.0193 | 0.9528 | 0.0164 | 0.9708 | 0.0115 | 0.9492 | 0.0186 | 0.9586 | 0.0169 | 0.9682 | 0.0111 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9658 | 0.0263 | 0.9429 | 0.0321 | 0.9112 | 0.0300 | 0.9040 | 0.0328 | 0.9691 | 0.0180 | 0.9674 | 0.0112 | 0.9669 | 0.0091 | 0.9593 | 0.0220 | 0.9485 | 0.0232 | 0.9440 | 0.0185 |
| | E-net | 0.9635 | 0.0264 | 0.9316 | 0.0325 | 0.8913 | 0.0322 | 0.8589 | 0.0355 | 0.9657 | 0.0226 | 0.9644 | 0.0138 | 0.9618 | 0.0133 | 0.9551 | 0.0232 | 0.9386 | 0.0252 | 0.9218 | 0.0224 |
| | SCAD | 0.9227 | 0.0595 | 0.9282 | 0.0421 | 0.9399 | 0.0310 | 0.9729 | 0.0104 | 0.9359 | 0.0539 | 0.9344 | 0.0465 | 0.9665 | 0.0258 | 0.9208 | 0.0498 | 0.9397 | 0.0361 | 0.9625 | 0.0165 |
| | MCP | 0.9531 | 0.0346 | 0.9537 | 0.0258 | 0.9669 | 0.0140 | 0.9740 | 0.0088 | 0.9575 | 0.0341 | 0.9552 | 0.0344 | 0.9649 | 0.0189 | 0.9525 | 0.0282 | 0.9631 | 0.0189 | 0.9701 | 0.0122 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.7575 | 0.0567 | 0.7624 | 0.0660 | 0.7613 | 0.0603 | 0.7647 | 0.0629 | 0.7569 | 0.0645 | 0.7880 | 0.0625 | 0.8727 | 0.0661 | 0.7687 | 0.0734 | 0.7819 | 0.0801 | 0.8625 | 0.0894 |
| | BIC F | 0.9546 | 0.0198 | 0.9600 | 0.0153 | 0.9631 | 0.0186 | 0.9685 | 0.0172 | 0.9546 | 0.0204 | 0.9613 | 0.0205 | 0.9725 | 0.0150 | 0.9580 | 0.0161 | 0.9641 | 0.0161 | 0.9768 | 0.0112 |
| | AIC SF | 0.7645 | 0.0532 | 0.7689 | 0.0621 | 0.7652 | 0.0571 | 0.7699 | 0.0616 | 0.7614 | 0.0611 | 0.7937 | 0.0576 | 0.8825 | 0.0585 | 0.7739 | 0.0676 | 0.7868 | 0.0703 | 0.8677 | 0.0796 |
| | BIC SF | 0.9551 | 0.0193 | 0.9601 | 0.0153 | 0.9634 | 0.0184 | 0.9689 | 0.0168 | 0.9546 | 0.0204 | 0.9615 | 0.0197 | 0.9732 | 0.0137 | 0.9579 | 0.0163 | 0.9640 | 0.0163 | 0.9768 | 0.0112 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9882 | 0.0064 | 0.9849 | 0.0119 | 0.9687 | 0.0246 | 0.9502 | 0.0214 | 0.9884 | 0.0076 | 0.9882 | 0.0043 | 0.9811 | 0.0091 | 0.9867 | 0.0068 | 0.9792 | 0.0136 | 0.9682 | 0.0151 |
| | E-net | 0.9878 | 0.0071 | 0.9829 | 0.0149 | 0.9617 | 0.0293 | 0.9177 | 0.0281 | 0.9884 | 0.0076 | 0.9877 | 0.0050 | 0.9766 | 0.0098 | 0.9856 | 0.0094 | 0.9749 | 0.0154 | 0.9492 | 0.0205 |
| | SCAD | 0.9455 | 0.0481 | 0.9402 | 0.0418 | 0.9475 | 0.0313 | 0.9767 | 0.0192 | 0.9547 | 0.0425 | 0.9613 | 0.0403 | 0.9668 | 0.0300 | 0.9435 | 0.0407 | 0.9503 | 0.0306 | 0.9749 | 0.0210 |
| | MCP | 0.9679 | 0.0357 | 0.9633 | 0.0278 | 0.9722 | 0.0228 | 0.9824 | 0.0095 | 0.9725 | 0.0268 | 0.9781 | 0.0253 | 0.9746 | 0.0193 | 0.9651 | 0.0286 | 0.9745 | 0.0183 | 0.9786 | 0.0138 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.7606 | 0.0585 | 0.7713 | 0.0672 | 0.7565 | 0.0677 | 0.7659 | 0.0712 | 0.7684 | 0.0662 | 0.7958 | 0.0599 | 0.8738 | 0.0608 | 0.7815 | 0.0692 | 0.7931 | 0.0754 | 0.8723 | 0.0852 |
| | BIC F | 0.9626 | 0.0178 | 0.9681 | 0.0159 | 0.9681 | 0.0202 | 0.9717 | 0.0124 | 0.9607 | 0.0198 | 0.9661 | 0.0188 | 0.9774 | 0.0122 | 0.9655 | 0.0166 | 0.9705 | 0.0146 | 0.9774 | 0.0132 |
| | AIC SF | 0.7664 | 0.0560 | 0.7766 | 0.0646 | 0.7674 | 0.0590 | 0.7749 | 0.0690 | 0.7777 | 0.0581 | 0.8015 | 0.0570 | 0.8805 | 0.0557 | 0.7877 | 0.0629 | 0.7997 | 0.0707 | 0.8774 | 0.0763 |
| | BIC SF | 0.9626 | 0.0178 | 0.9682 | 0.0157 | 0.9683 | 0.0199 | 0.9717 | 0.0124 | 0.9608 | 0.0196 | 0.9662 | 0.0185 | 0.9774 | 0.0122 | 0.9655 | 0.0166 | 0.9708 | 0.0138 | 0.9775 | 0.0130 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9893 | 0.0021 | 0.9895 | 0.0000 | 0.9868 | 0.0080 | 0.9789 | 0.0158 | 0.9895 | 0.0000 | 0.9888 | 0.0044 | 0.9874 | 0.0050 | 0.9892 | 0.0023 | 0.9885 | 0.0034 | 0.9847 | 0.0101 |
| | E-net | 0.9893 | 0.0021 | 0.9894 | 0.0011 | 0.9862 | 0.0099 | 0.9725 | 0.0243 | 0.9895 | 0.0000 | 0.9888 | 0.0044 | 0.9863 | 0.0068 | 0.9892 | 0.0023 | 0.9883 | 0.0039 | 0.9815 | 0.0149 |
| | SCAD | 0.9491 | 0.0470 | 0.9448 | 0.0376 | 0.9458 | 0.0304 | 0.9700 | 0.0205 | 0.9509 | 0.0411 | 0.9557 | 0.0383 | 0.9596 | 0.0302 | 0.9471 | 0.0411 | 0.9536 | 0.0244 | 0.9667 | 0.0176 |
| | MCP | 0.9726 | 0.0254 | 0.9723 | 0.0220 | 0.9734 | 0.0200 | 0.9815 | 0.0070 | 0.9746 | 0.0221 | 0.9759 | 0.0203 | 0.9758 | 0.0175 | 0.9735 | 0.0233 | 0.9772 | 0.0133 | 0.9763 | 0.0137 |

Table 69: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 200$ and $p = 2000$. See Figure 69 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9988 | 0.0005 | 0.9948 | 0.0031 | 0.9911 | 0.0024 | 0.9907 | 0.0023 | 0.9984 | 0.0016 | 0.9983 | 0.0013 | 0.9982 | 0.0008 | 0.9980 | 0.0013 | 0.9958 | 0.0048 | 0.9955 | 0.0013 |
| | E-net | 0.9986 | 0.0009 | 0.9931 | 0.0033 | 0.9889 | 0.0025 | 0.9864 | 0.0028 | 0.9982 | 0.0020 | 0.9980 | 0.0017 | 0.9980 | 0.0007 | 0.9976 | 0.0016 | 0.9948 | 0.0048 | 0.9932 | 0.0016 |
| | SCAD | 0.9959 | 0.0045 | 0.9937 | 0.0048 | 0.9942 | 0.0033 | 0.9973 | 0.0037 | 0.9944 | 0.0071 | 0.9954 | 0.0062 | 0.9961 | 0.0044 | 0.9948 | 0.0055 | 0.9959 | 0.0046 | 0.9967 | 0.0019 |
| | MCP | 0.9979 | 0.0022 | 0.9971 | 0.0020 | 0.9982 | 0.0009 | 0.9989 | 0.0003 | 0.9977 | 0.0022 | 0.9979 | 0.0019 | 0.9978 | 0.0020 | 0.9976 | 0.0022 | 0.9980 | 0.0017 | 0.9979 | 0.0012 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9995 | 0.0002 | 0.9991 | 0.0011 | 0.9976 | 0.0022 | 0.9957 | 0.0020 | 0.9995 | 0.0001 | 0.9994 | 0.0002 | 0.9992 | 0.0004 | 0.9994 | 0.0006 | 0.9989 | 0.0009 | 0.9977 | 0.0011 |
| | E-net | 0.9995 | 0.0002 | 0.9990 | 0.0013 | 0.9969 | 0.0027 | 0.9929 | 0.0027 | 0.9995 | 0.0002 | 0.9994 | 0.0002 | 0.9989 | 0.0004 | 0.9994 | 0.0008 | 0.9986 | 0.0011 | 0.9961 | 0.0015 |
| | SCAD | 0.9948 | 0.0059 | 0.9943 | 0.0042 | 0.9950 | 0.0032 | 0.9961 | 0.0031 | 0.9936 | 0.0066 | 0.9948 | 0.0062 | 0.9972 | 0.0039 | 0.9943 | 0.0059 | 0.9958 | 0.0041 | 0.9979 | 0.0019 |
| | MCP | 0.9984 | 0.0018 | 0.9980 | 0.0017 | 0.9984 | 0.0009 | 0.9991 | 0.0004 | 0.9982 | 0.0018 | 0.9982 | 0.0022 | 0.9988 | 0.0012 | 0.9982 | 0.0018 | 0.9987 | 0.0013 | 0.9988 | 0.0011 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9995 | 0.0002 | 0.9994 | 0.0008 | 0.9992 | 0.0009 | 0.9987 | 0.0011 | 0.9995 | 0.0000 | 0.9995 | 0.0001 | 0.9994 | 0.0002 | 0.9995 | 0.0001 | 0.9995 | 0.0002 | 0.9992 | 0.0005 |
| | E-net | 0.9995 | 0.0002 | 0.9994 | 0.0009 | 0.9991 | 0.0010 | 0.9981 | 0.0018 | 0.9995 | 0.0000 | 0.9995 | 0.0001 | 0.9994 | 0.0002 | 0.9995 | 0.0001 | 0.9994 | 0.0003 | 0.9991 | 0.0009 |
| | SCAD | 0.9952 | 0.0061 | 0.9946 | 0.0051 | 0.9944 | 0.0034 | 0.9977 | 0.0016 | 0.9949 | 0.0069 | 0.9939 | 0.0073 | 0.9969 | 0.0032 | 0.9945 | 0.0061 | 0.9945 | 0.0044 | 0.9969 | 0.0021 |
| | MCP | 0.9982 | 0.0020 | 0.9979 | 0.0018 | 0.9983 | 0.0009 | 0.9990 | 0.0003 | 0.9980 | 0.0018 | 0.9979 | 0.0023 | 0.9986 | 0.0016 | 0.9981 | 0.0020 | 0.9983 | 0.0014 | 0.9986 | 0.0011 |

Table 70: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 1000$ and $p = 10$. See Figure 70 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.326 | 0.1125 | 0.336 | 0.0980 | 0.338 | 0.0930 | 0.440 | 0.1206 | 0.316 | 0.1143 | 0.338 | 0.1052 | 0.348 | 0.1259 | 0.340 | 0.0964 | 0.336 | 0.1059 | 0.356 | 0.1157 |
| | BIC B | 0.400 | 0.0284 | 0.392 | 0.0394 | 0.402 | 0.0449 | 0.504 | 0.1044 | 0.400 | 0.0284 | 0.396 | 0.0281 | 0.496 | 0.1118 | 0.392 | 0.0394 | 0.394 | 0.0343 | 0.492 | 0.1116 |
| | AIC SB | 0.326 | 0.1125 | 0.336 | 0.0980 | 0.338 | 0.0930 | 0.440 | 0.1206 | 0.316 | 0.1143 | 0.338 | 0.1052 | 0.348 | 0.1259 | 0.340 | 0.0964 | 0.336 | 0.1059 | 0.356 | 0.1157 |
| | BIC SB | 0.400 | 0.0284 | 0.392 | 0.0394 | 0.402 | 0.0449 | 0.504 | 0.1044 | 0.400 | 0.0284 | 0.396 | 0.0281 | 0.496 | 0.1118 | 0.392 | 0.0394 | 0.394 | 0.0343 | 0.492 | 0.1116 |
| | AIC F | 0.326 | 0.1125 | 0.336 | 0.0980 | 0.338 | 0.0930 | 0.448 | 0.1210 | 0.318 | 0.1140 | 0.344 | 0.1028 | 0.374 | 0.1125 | 0.342 | 0.0997 | 0.340 | 0.1005 | 0.370 | 0.1150 |
| | BIC F | 0.400 | 0.0284 | 0.392 | 0.0394 | 0.402 | 0.0449 | 0.506 | 0.1043 | 0.400 | 0.0284 | 0.396 | 0.0281 | 0.496 | 0.1082 | 0.392 | 0.0394 | 0.394 | 0.0343 | 0.494 | 0.1118 |
| | AIC SF | 0.326 | 0.1125 | 0.336 | 0.0980 | 0.338 | 0.0930 | 0.448 | 0.1210 | 0.318 | 0.1140 | 0.344 | 0.1028 | 0.378 | 0.1097 | 0.344 | 0.0946 | 0.340 | 0.1005 | 0.370 | 0.1150 |
| | BIC SF | 0.400 | 0.0284 | 0.392 | 0.0394 | 0.402 | 0.0449 | 0.506 | 0.1043 | 0.400 | 0.0284 | 0.396 | 0.0281 | 0.496 | 0.1082 | 0.392 | 0.0394 | 0.394 | 0.0343 | 0.494 | 0.1118 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.400 | 0.0402 | 0.382 | 0.0642 | 0.340 | 0.0964 | 0.342 | 0.1281 | 0.402 | 0.0348 | 0.394 | 0.0343 | 0.322 | 0.1203 | 0.392 | 0.0394 | 0.354 | 0.0937 | 0.320 | 0.1393 |
| | E-net | 0.396 | 0.0400 | 0.368 | 0.0790 | 0.308 | 0.1220 | 0.186 | 0.1311 | 0.400 | 0.0284 | 0.392 | 0.0394 | 0.282 | 0.1140 | 0.388 | 0.0477 | 0.342 | 0.0997 | 0.198 | 0.1348 |
| | SCAD | 0.264 | 0.1501 | 0.280 | 0.1421 | 0.278 | 0.1501 | 0.446 | 0.1654 | 0.280 | 0.1363 | 0.276 | 0.1471 | 0.320 | 0.2089 | 0.276 | 0.1386 | 0.286 | 0.1511 | 0.312 | 0.2016 |
| | MCP | 0.308 | 0.1376 | 0.316 | 0.1369 | 0.292 | 0.1542 | 0.448 | 0.1660 | 0.318 | 0.1336 | 0.302 | 0.1378 | 0.324 | 0.2104 | 0.312 | 0.1373 | 0.316 | 0.1339 | 0.330 | 0.1977 |
| 3 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.338 | 0.1013 | 0.326 | 0.1050 | 0.354 | 0.1132 | 0.504 | 0.1435 | 0.324 | 0.1093 | 0.338 | 0.1052 | 0.438 | 0.1469 | 0.328 | 0.1083 | 0.350 | 0.1040 | 0.458 | 0.1485 |
| | BIC B | 0.430 | 0.0718 | 0.436 | 0.0823 | 0.468 | 0.0952 | 0.652 | 0.0926 | 0.448 | 0.0858 | 0.454 | 0.1058 | 0.600 | 0.1025 | 0.422 | 0.0799 | 0.452 | 0.0882 | 0.606 | 0.0600 |
| | AIC SB | 0.338 | 0.1013 | 0.326 | 0.1050 | 0.354 | 0.1132 | 0.504 | 0.1435 | 0.324 | 0.1093 | 0.338 | 0.1052 | 0.438 | 0.1469 | 0.328 | 0.1083 | 0.350 | 0.1040 | 0.458 | 0.1485 |
| | BIC SB | 0.430 | 0.0718 | 0.436 | 0.0823 | 0.468 | 0.0952 | 0.652 | 0.0926 | 0.448 | 0.0858 | 0.454 | 0.1058 | 0.600 | 0.1025 | 0.422 | 0.0799 | 0.452 | 0.0882 | 0.606 | 0.0600 |
| | AIC F | 0.338 | 0.1013 | 0.328 | 0.1045 | 0.356 | 0.1122 | 0.520 | 0.1421 | 0.326 | 0.1088 | 0.344 | 0.1028 | 0.484 | 0.1454 | 0.330 | 0.1078 | 0.354 | 0.1058 | 0.492 | 0.1316 |
| | BIC F | 0.430 | 0.0718 | 0.436 | 0.0823 | 0.470 | 0.0959 | 0.656 | 0.0903 | 0.448 | 0.0858 | 0.458 | 0.1037 | 0.612 | 0.1094 | 0.422 | 0.0799 | 0.456 | 0.0903 | 0.608 | 0.0563 |
| | AIC SF | 0.338 | 0.1013 | 0.328 | 0.1045 | 0.356 | 0.1122 | 0.520 | 0.1421 | 0.326 | 0.1088 | 0.344 | 0.1028 | 0.486 | 0.1484 | 0.330 | 0.1078 | 0.354 | 0.1058 | 0.492 | 0.1316 |
| | BIC SF | 0.430 | 0.0718 | 0.436 | 0.0823 | 0.470 | 0.0959 | 0.656 | 0.0903 | 0.448 | 0.0858 | 0.458 | 0.1037 | 0.612 | 0.1094 | 0.422 | 0.0799 | 0.456 | 0.0903 | 0.608 | 0.0563 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.724 | 0.1232 | 0.624 | 0.1564 | 0.528 | 0.1349 | 0.490 | 0.1738 | 0.698 | 0.1407 | 0.658 | 0.1615 | 0.490 | 0.1691 | 0.670 | 0.1592 | 0.596 | 0.1530 | 0.560 | 0.1633 |
| | E-net | 0.706 | 0.1317 | 0.592 | 0.1555 | 0.466 | 0.1241 | 0.296 | 0.1595 | 0.672 | 0.1621 | 0.608 | 0.1727 | 0.398 | 0.1491 | 0.654 | 0.1604 | 0.580 | 0.1491 | 0.466 | 0.2071 |
| | SCAD | 0.306 | 0.1669 | 0.306 | 0.1594 | 0.326 | 0.1697 | 0.558 | 0.2226 | 0.248 | 0.1685 | 0.312 | 0.1914 | 0.502 | 0.1938 | 0.302 | 0.1463 | 0.322 | 0.1679 | 0.502 | 0.1809 |
| | MCP | 0.360 | 0.1449 | 0.352 | 0.1636 | 0.356 | 0.1898 | 0.556 | 0.2231 | 0.302 | 0.1875 | 0.358 | 0.1996 | 0.510 | 0.1915 | 0.340 | 0.1435 | 0.362 | 0.1722 | 0.534 | 0.1659 |
| 6 | OLS | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | AIC B | 0.478 | 0.1727 | 0.516 | 0.1686 | 0.542 | 0.1640 | 0.640 | 0.1752 | 0.492 | 0.1739 | 0.526 | 0.1649 | 0.586 | 0.1870 | 0.476 | 0.1628 | 0.508 | 0.1619 | 0.624 | 0.1485 |
| | BIC B | 0.700 | 0.1189 | 0.712 | 0.1076 | 0.730 | 0.0959 | 0.776 | 0.0653 | 0.710 | 0.1219 | 0.724 | 0.1093 | 0.756 | 0.0880 | 0.712 | 0.1148 | 0.682 | 0.1029 | 0.710 | 0.1040 |
| | AIC SB | 0.478 | 0.1727 | 0.516 | 0.1686 | 0.542 | 0.1640 | 0.640 | 0.1752 | 0.492 | 0.1739 | 0.526 | 0.1649 | 0.586 | 0.1870 | 0.476 | 0.1628 | 0.508 | 0.1619 | 0.624 | 0.1485 |
| | BIC SB | 0.700 | 0.1189 | 0.712 | 0.1076 | 0.730 | 0.0959 | 0.776 | 0.0653 | 0.710 | 0.1219 | 0.724 | 0.1093 | 0.756 | 0.0880 | 0.712 | 0.1148 | 0.682 | 0.1029 | 0.710 | 0.1040 |
| | AIC F | 0.480 | 0.1729 | 0.520 | 0.1729 | 0.558 | 0.1590 | 0.676 | 0.1603 | 0.498 | 0.1764 | 0.542 | 0.1689 | 0.656 | 0.1479 | 0.476 | 0.1628 | 0.522 | 0.1554 | 0.648 | 0.1453 |
| | BIC F | 0.702 | 0.1155 | 0.712 | 0.1076 | 0.732 | 0.0952 | 0.776 | 0.0653 | 0.712 | 0.1183 | 0.726 | 0.1088 | 0.756 | 0.0925 | 0.712 | 0.1148 | 0.690 | 0.1040 | 0.712 | 0.1037 |
| | AIC SF | 0.480 | 0.1729 | 0.520 | 0.1729 | 0.558 | 0.1590 | 0.676 | 0.1603 | 0.498 | 0.1764 | 0.544 | 0.1635 | 0.658 | 0.1430 | 0.476 | 0.1628 | 0.522 | 0.1554 | 0.648 | 0.1453 |
| | BIC SF | 0.702 | 0.1155 | 0.712 | 0.1076 | 0.732 | 0.0952 | 0.776 | 0.0653 | 0.712 | 0.1183 | 0.726 | 0.1088 | 0.760 | 0.0853 | 0.712 | 0.1148 | 0.690 | 0.1040 | 0.712 | 0.1037 |
| | Ridge | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 | 0.000 | 0.0000 |
| | Lasso | 0.800 | 0.0000 | 0.800 | 0.0000 | 0.798 | 0.0200 | 0.730 | 0.1150 | 0.800 | 0.0000 | 0.800 | 0.0000 | 0.738 | 0.1126 | 0.800 | 0.0000 | 0.800 | 0.0000 | 0.782 | 0.0575 |
| | E-net | 0.800 | 0.0000 | 0.800 | 0.0000 | 0.790 | 0.0522 | 0.646 | 0.1604 | 0.800 | 0.0000 | 0.800 | 0.0000 | 0.682 | 0.1366 | 0.800 | 0.0000 | 0.800 | 0.0000 | 0.774 | 0.0836 |
| | SCAD | 0.610 | 0.2385 | 0.602 | 0.2535 | 0.628 | 0.2292 | 0.720 | 0.1798 | 0.582 | 0.2576 | 0.630 | 0.2209 | 0.682 | 0.2185 | 0.584 | 0.2489 | 0.572 | 0.2089 | 0.650 | 0.1936 |
| | MCP | 0.650 | 0.2263 | 0.640 | 0.2327 | 0.684 | 0.1973 | 0.716 | 0.1587 | 0.632 | 0.2441 | 0.678 | 0.2008 | 0.676 | 0.1985 | 0.632 | 0.2339 | 0.628 | 0.2128 | 0.666 | 0.1821 |

Table 71: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 1000$ and $p = 100$. See Figure 71 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.8161 | 0.0338 | 0.8169 | 0.0391 | 0.8104 | 0.0384 | 0.8092 | 0.0443 | 0.8105 | 0.0378 | 0.8213 | 0.0394 | 0.8896 | 0.0397 | 0.8105 | 0.0407 | 0.8269 | 0.0478 | 0.8899 | 0.0492 |
| | BIC F | 0.9606 | 0.0093 | 0.9609 | 0.0095 | 0.9601 | 0.0093 | 0.9659 | 0.0083 | 0.9601 | 0.0084 | 0.9617 | 0.0087 | 0.9713 | 0.0076 | 0.9607 | 0.0102 | 0.9631 | 0.0092 | 0.9696 | 0.0080 |
| | AIC SF | 0.8165 | 0.0331 | 0.8181 | 0.0382 | 0.8119 | 0.0377 | 0.8104 | 0.0450 | 0.8112 | 0.0383 | 0.8237 | 0.0391 | 0.8935 | 0.0387 | 0.8120 | 0.0397 | 0.8273 | 0.0476 | 0.8912 | 0.0488 |
| | BIC SF | 0.9606 | 0.0093 | 0.9609 | 0.0095 | 0.9601 | 0.0093 | 0.9659 | 0.0083 | 0.9601 | 0.0084 | 0.9617 | 0.0087 | 0.9713 | 0.0076 | 0.9607 | 0.0102 | 0.9631 | 0.0092 | 0.9696 | 0.0080 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9660 | 0.0061 | 0.9524 | 0.0235 | 0.9157 | 0.0292 | 0.8825 | 0.0289 | 0.9662 | 0.0113 | 0.9679 | 0.0023 | 0.9659 | 0.0058 | 0.9656 | 0.0061 | 0.9527 | 0.0157 | 0.9349 | 0.0202 |
| | E-net | 0.9654 | 0.0072 | 0.9437 | 0.0264 | 0.8922 | 0.0311 | 0.8260 | 0.0327 | 0.9654 | 0.0144 | 0.9674 | 0.0038 | 0.9639 | 0.0056 | 0.9646 | 0.0077 | 0.9441 | 0.0177 | 0.9066 | 0.0221 |
| | SCAD | 0.8940 | 0.0469 | 0.8994 | 0.0487 | 0.9156 | 0.0358 | 0.9714 | 0.0105 | 0.8898 | 0.0535 | 0.8942 | 0.0498 | 0.9498 | 0.0255 | 0.9012 | 0.0526 | 0.9054 | 0.0369 | 0.9574 | 0.0219 |
| | MCP | 0.9412 | 0.0276 | 0.9423 | 0.0295 | 0.9514 | 0.0209 | 0.9727 | 0.0085 | 0.9399 | 0.0312 | 0.9364 | 0.0325 | 0.9649 | 0.0158 | 0.9436 | 0.0345 | 0.9436 | 0.0195 | 0.9626 | 0.0174 |
| 3 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.8044 | 0.0392 | 0.8121 | 0.0388 | 0.8123 | 0.0415 | 0.8241 | 0.0338 | 0.8115 | 0.0379 | 0.8305 | 0.0417 | 0.8878 | 0.0427 | 0.8112 | 0.0434 | 0.8280 | 0.0443 | 0.9041 | 0.0459 |
| | BIC F | 0.9619 | 0.0117 | 0.9623 | 0.0085 | 0.9624 | 0.0113 | 0.9760 | 0.0075 | 0.9614 | 0.0106 | 0.9657 | 0.0118 | 0.9769 | 0.0066 | 0.9636 | 0.0092 | 0.9665 | 0.0094 | 0.9793 | 0.0072 |
| | AIC SF | 0.8051 | 0.0388 | 0.8135 | 0.0387 | 0.8128 | 0.0419 | 0.8242 | 0.0338 | 0.8119 | 0.0377 | 0.8327 | 0.0404 | 0.8911 | 0.0416 | 0.8123 | 0.0427 | 0.8304 | 0.0429 | 0.9047 | 0.0448 |
| | BIC SF | 0.9619 | 0.0117 | 0.9623 | 0.0085 | 0.9625 | 0.0112 | 0.9760 | 0.0075 | 0.9614 | 0.0106 | 0.9657 | 0.0118 | 0.9769 | 0.0066 | 0.9636 | 0.0092 | 0.9665 | 0.0094 | 0.9793 | 0.0072 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9865 | 0.0062 | 0.9793 | 0.0118 | 0.9667 | 0.0184 | 0.9361 | 0.0307 | 0.9862 | 0.0059 | 0.9833 | 0.0089 | 0.9755 | 0.0094 | 0.9806 | 0.0080 | 0.9733 | 0.0104 | 0.9634 | 0.0148 |
| | E-net | 0.9860 | 0.0065 | 0.9765 | 0.0136 | 0.9548 | 0.0262 | 0.8768 | 0.0311 | 0.9852 | 0.0070 | 0.9809 | 0.0095 | 0.9696 | 0.0079 | 0.9792 | 0.0082 | 0.9685 | 0.0121 | 0.9320 | 0.0173 |
| | SCAD | 0.9144 | 0.0504 | 0.9076 | 0.0451 | 0.9238 | 0.0327 | 0.9785 | 0.0107 | 0.9138 | 0.0485 | 0.9244 | 0.0516 | 0.9544 | 0.0288 | 0.9228 | 0.0506 | 0.9272 | 0.0323 | 0.9702 | 0.0196 |
| | MCP | 0.9483 | 0.0345 | 0.9439 | 0.0255 | 0.9562 | 0.0197 | 0.9809 | 0.0089 | 0.9468 | 0.0361 | 0.9568 | 0.0276 | 0.9694 | 0.0164 | 0.9514 | 0.0295 | 0.9559 | 0.0197 | 0.9791 | 0.0119 |
| 6 | OLS | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | AIC F | 0.8105 | 0.0412 | 0.8216 | 0.0420 | 0.8236 | 0.0457 | 0.8323 | 0.0377 | 0.8239 | 0.0384 | 0.8416 | 0.0421 | 0.8984 | 0.0444 | 0.8242 | 0.0431 | 0.8373 | 0.0481 | 0.9121 | 0.0466 |
| | BIC F | 0.9788 | 0.0104 | 0.9765 | 0.0111 | 0.9775 | 0.0110 | 0.9801 | 0.0091 | 0.9768 | 0.0105 | 0.9802 | 0.0113 | 0.9840 | 0.0080 | 0.9757 | 0.0119 | 0.9799 | 0.0089 | 0.9853 | 0.0075 |
| | AIC SF | 0.8114 | 0.0407 | 0.8220 | 0.0421 | 0.8251 | 0.0444 | 0.8332 | 0.0377 | 0.8245 | 0.0380 | 0.8443 | 0.0411 | 0.9015 | 0.0422 | 0.8254 | 0.0421 | 0.8389 | 0.0465 | 0.9122 | 0.0466 |
| | BIC SF | 0.9788 | 0.0104 | 0.9765 | 0.0111 | 0.9775 | 0.0110 | 0.9801 | 0.0091 | 0.9768 | 0.0105 | 0.9802 | 0.0113 | 0.9840 | 0.0080 | 0.9757 | 0.0119 | 0.9799 | 0.0089 | 0.9854 | 0.0072 |
| | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9895 | 0.0000 | 0.9892 | 0.0023 | 0.9889 | 0.0023 | 0.9697 | 0.0214 | 0.9895 | 0.0000 | 0.9894 | 0.0011 | 0.9872 | 0.0049 | 0.9895 | 0.0000 | 0.9893 | 0.0015 | 0.9824 | 0.0098 |
| | E-net | 0.9895 | 0.0000 | 0.9888 | 0.0036 | 0.9879 | 0.0057 | 0.9527 | 0.0315 | 0.9895 | 0.0000 | 0.9894 | 0.0011 | 0.9857 | 0.0059 | 0.9894 | 0.0011 | 0.9889 | 0.0031 | 0.9743 | 0.0167 |
| | SCAD | 0.9666 | 0.0371 | 0.9579 | 0.0413 | 0.9633 | 0.0325 | 0.9755 | 0.0219 | 0.9656 | 0.0423 | 0.9734 | 0.0355 | 0.9783 | 0.0217 | 0.9612 | 0.0508 | 0.9639 | 0.0364 | 0.9771 | 0.0171 |
| | MCP | 0.9777 | 0.0240 | 0.9749 | 0.0246 | 0.9786 | 0.0184 | 0.9837 | 0.0081 | 0.9762 | 0.0279 | 0.9834 | 0.0167 | 0.9832 | 0.0126 | 0.9749 | 0.0296 | 0.9781 | 0.0199 | 0.9818 | 0.0115 |

Table 72: Mean and standard deviation of the $\beta$-specificity for the non-linear simulations when $n = 1000$ and $p = 2000$. See Figure 72 for the corresponding visualization.

| | Type | Independent | | Symmetric | | | | | | Autoregressive | | | | | | Blockwise | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Corr. | 0 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | | 0.2 | | 0.5 | | 0.9 | |
| $\sigma$ | Model | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| 1 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9984 | 0.0004 | 0.9952 | 0.0031 | 0.9903 | 0.0030 | 0.9886 | 0.0028 | 0.9984 | 0.0003 | 0.9985 | 0.0002 | 0.9984 | 0.0003 | 0.9982 | 0.0004 | 0.9964 | 0.0014 | 0.9948 | 0.0014 |
| | E-net | 0.9983 | 0.0006 | 0.9938 | 0.0035 | 0.9874 | 0.0032 | 0.9826 | 0.0034 | 0.9984 | 0.0004 | 0.9985 | 0.0002 | 0.9982 | 0.0003 | 0.9979 | 0.0007 | 0.9954 | 0.0015 | 0.9916 | 0.0015 |
| | SCAD | 0.9914 | 0.0060 | 0.9907 | 0.0040 | 0.9937 | 0.0027 | 0.9990 | 0.0000 | 0.9902 | 0.0079 | 0.9913 | 0.0053 | 0.9987 | 0.0005 | 0.9914 | 0.0057 | 0.9960 | 0.0018 | 0.9990 | 0.0001 |
| | MCP | 0.9960 | 0.0025 | 0.9957 | 0.0024 | 0.9973 | 0.0011 | 0.9990 | 0.0000 | 0.9957 | 0.0029 | 0.9965 | 0.0022 | 0.9988 | 0.0004 | 0.9959 | 0.0028 | 0.9973 | 0.0012 | 0.9990 | 0.0001 |
| 3 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9994 | 0.0002 | 0.9991 | 0.0007 | 0.9971 | 0.0023 | 0.9945 | 0.0021 | 0.9994 | 0.0003 | 0.9993 | 0.0003 | 0.9988 | 0.0004 | 0.9992 | 0.0003 | 0.9986 | 0.0008 | 0.9973 | 0.0012 |
| | E-net | 0.9994 | 0.0003 | 0.9989 | 0.0010 | 0.9957 | 0.0027 | 0.9892 | 0.0026 | 0.9993 | 0.0003 | 0.9993 | 0.0004 | 0.9985 | 0.0004 | 0.9991 | 0.0004 | 0.9981 | 0.0011 | 0.9944 | 0.0013 |
| | SCAD | 0.9943 | 0.0057 | 0.9909 | 0.0058 | 0.9920 | 0.0031 | 0.9989 | 0.0007 | 0.9926 | 0.0068 | 0.9949 | 0.0053 | 0.9960 | 0.0045 | 0.9936 | 0.0051 | 0.9928 | 0.0048 | 0.9980 | 0.0021 |
| | MCP | 0.9970 | 0.0027 | 0.9960 | 0.0023 | 0.9973 | 0.0012 | 0.9993 | 0.0002 | 0.9968 | 0.0025 | 0.9973 | 0.0022 | 0.9980 | 0.0021 | 0.9970 | 0.0020 | 0.9971 | 0.0016 | 0.9987 | 0.0011 |
| 6 | Ridge | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| | Lasso | 0.9995 | 0.0000 | 0.9995 | 0.0000 | 0.9993 | 0.0005 | 0.9977 | 0.0015 | 0.9995 | 0.0000 | 0.9995 | 0.0000 | 0.9994 | 0.0002 | 0.9995 | 0.0000 | 0.9995 | 0.0001 | 0.9988 | 0.0009 |
| | E-net | 0.9995 | 0.0000 | 0.9995 | 0.0000 | 0.9992 | 0.0007 | 0.9964 | 0.0024 | 0.9995 | 0.0000 | 0.9995 | 0.0000 | 0.9992 | 0.0003 | 0.9995 | 0.0000 | 0.9995 | 0.0001 | 0.9982 | 0.0013 |
| | SCAD | 0.9970 | 0.0043 | 0.9956 | 0.0043 | 0.9964 | 0.0031 | 0.9969 | 0.0032 | 0.9960 | 0.0060 | 0.9970 | 0.0045 | 0.9979 | 0.0029 | 0.9970 | 0.0034 | 0.9975 | 0.0029 | 0.9982 | 0.0020 |
| | MCP | 0.9985 | 0.0022 | 0.9982 | 0.0018 | 0.9988 | 0.0010 | 0.9992 | 0.0003 | 0.9985 | 0.0019 | 0.9989 | 0.0011 | 0.9990 | 0.0010 | 0.9989 | 0.0013 | 0.9989 | 0.0011 | 0.9990 | 0.0009 |