Predicting Caravan Insurance Policy Ownership

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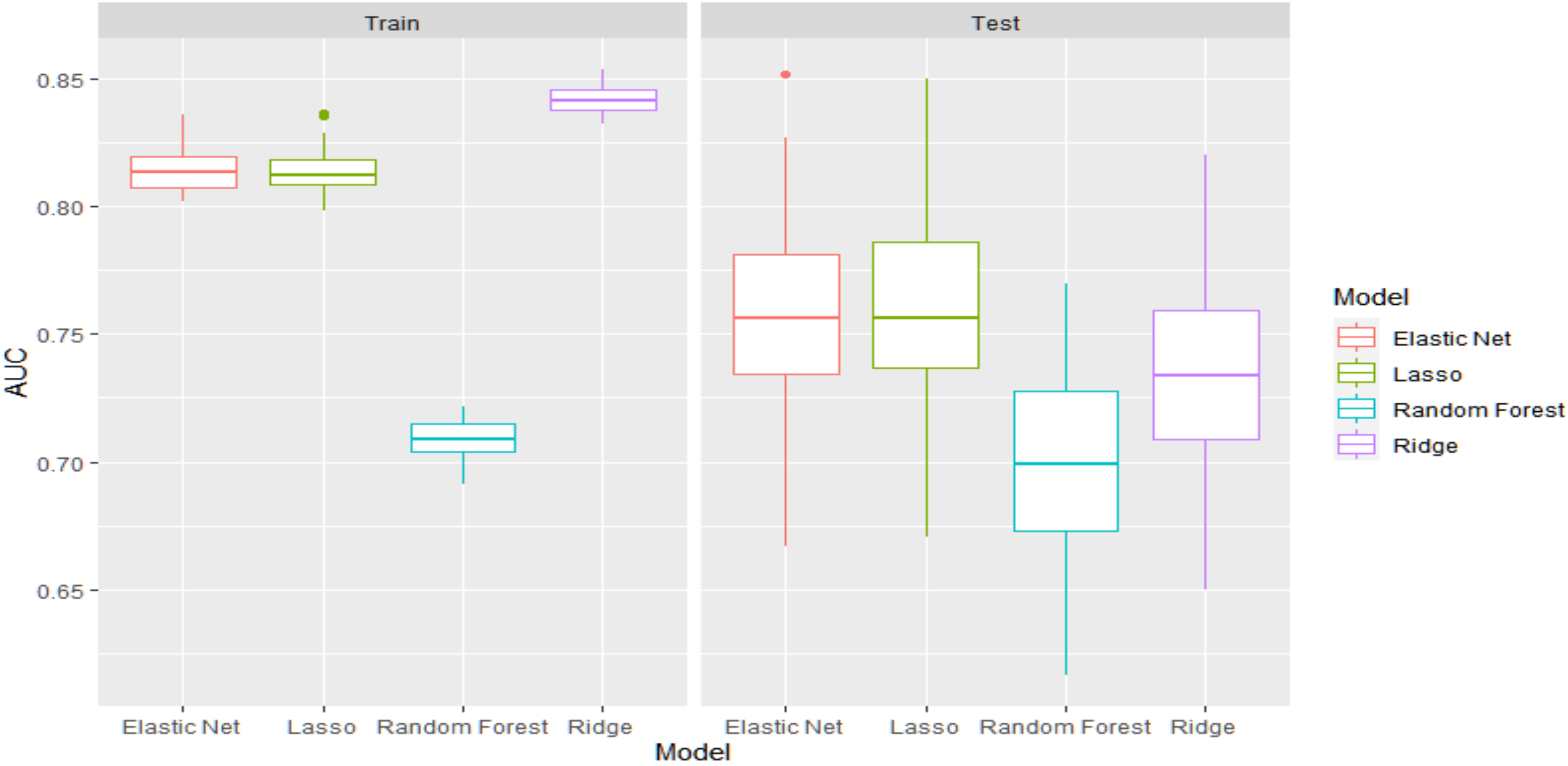
Caravan Dataset Description

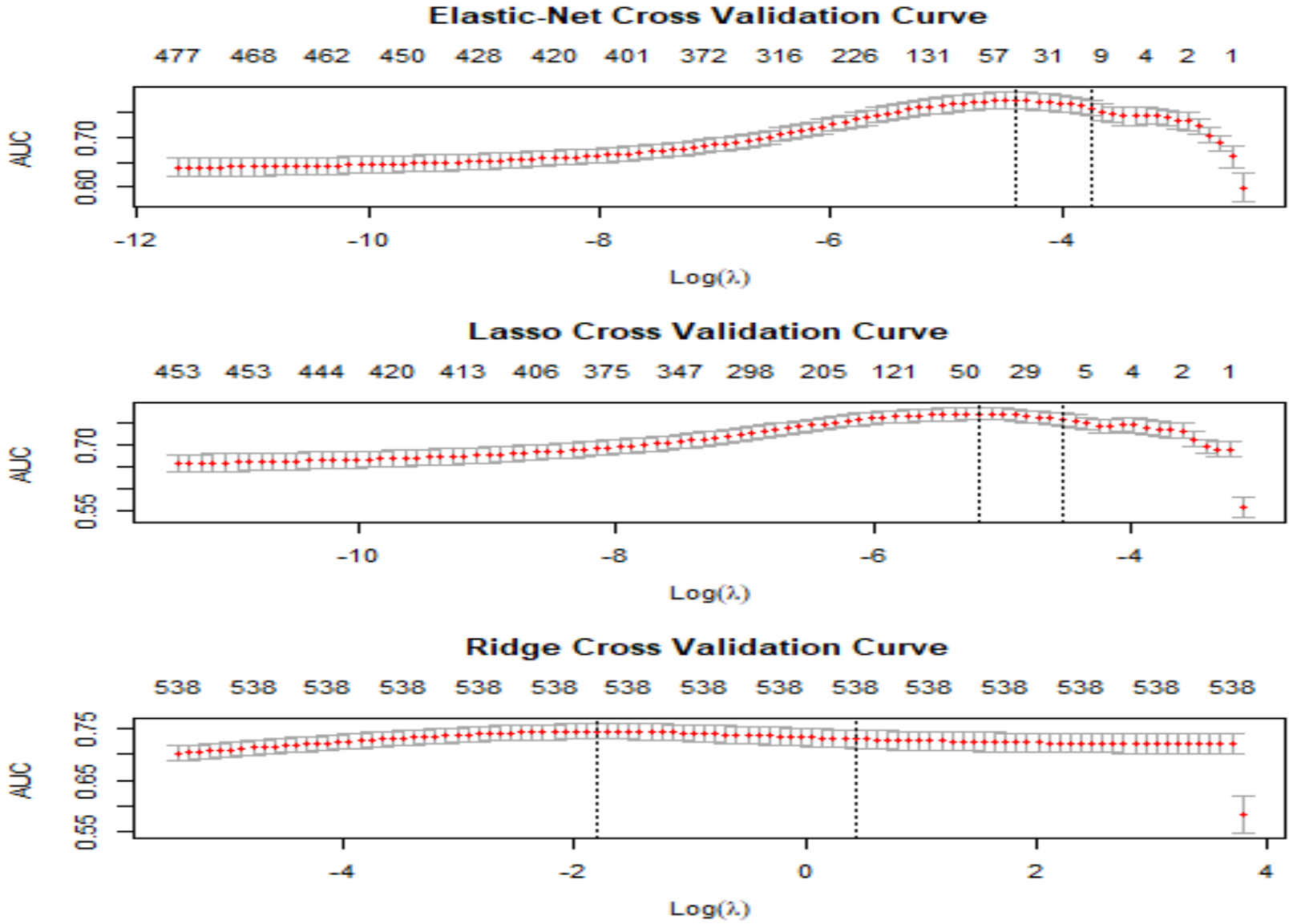
Goal - Predict who would be interested in buying a caravan insurance policy

- Data Breakdown
  - Sample Size (n) – 5822 | Predictors (p) – 86
  - Predictors include product usage data and socio-demographic data derived from zip area codes
  - Response Variable (Binary) – Caravan insurance policy owner
  - Predictors – Multinomial with a varying number levels 2-40
  - Data Source – http://kdd.ics.uci.edu/databases/tic/tic.html

AUC_{test} and AUC_{train} by Method



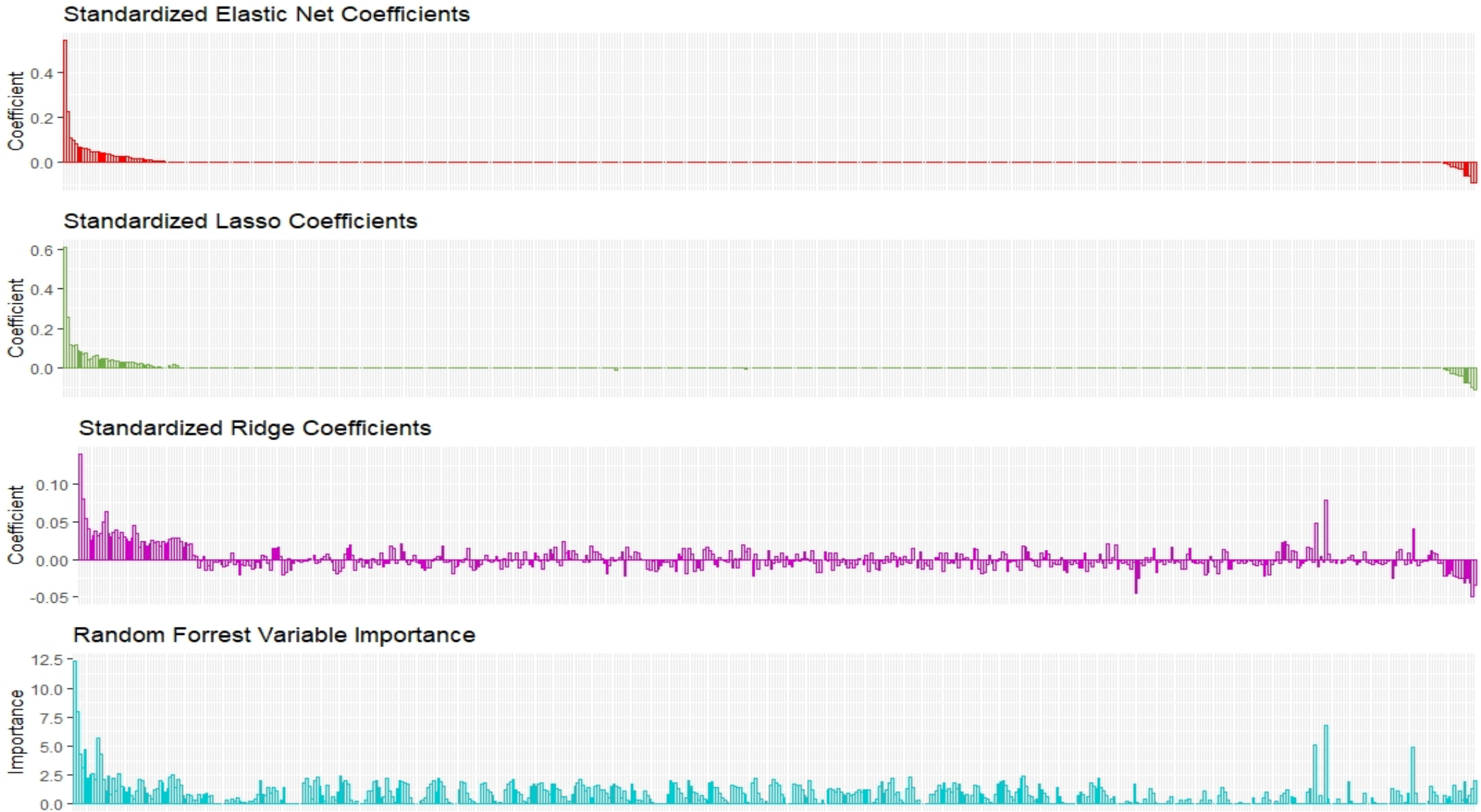
Cross Validation Curves



CV TIME	
ELASTIC NET	112 secs
LASSO	134 secs
RIDGE	64 secs

Model Performance / Time Tradeoff

	Test AUC (median)	Time
ELASTIC NET	0.76	129 secs
LASSO	0.76	146 secs
RIDGE	0.73	57 secs
RANDOM FOREST	0.70	155 secs


Standardized Elastic Net Coefficients
Coefficient
0.4
0.2
0.0
Standardized Lasso Coefficients
Coefficient
0.6
0.4
0.2
0.0
Standardized Ridge Coefficients
Coefficient
0.10
0.05
0.00
-0.05
Random Forrest Variable Importance
Importance
12.5
10.0
7.5
5.0
2.5
0.0

Conclusion

- **Important Features:**

PPERSAUT6	Contribution Car Policies, L6
PBRAND4	Contribution Fire Policies, 3 policies
APLEZIER1	No. of Boat Policies, 1 policy
PBRAND3	Contribution Fire Policies, 2 policies
MKOOPKLA7	Purchasing Power Class, level 7

- **Time vs Performance:** Elastic Net or Lasso are both parsimonious and give us approximately the same median AUC.

- **Best Model:** Elastic Net