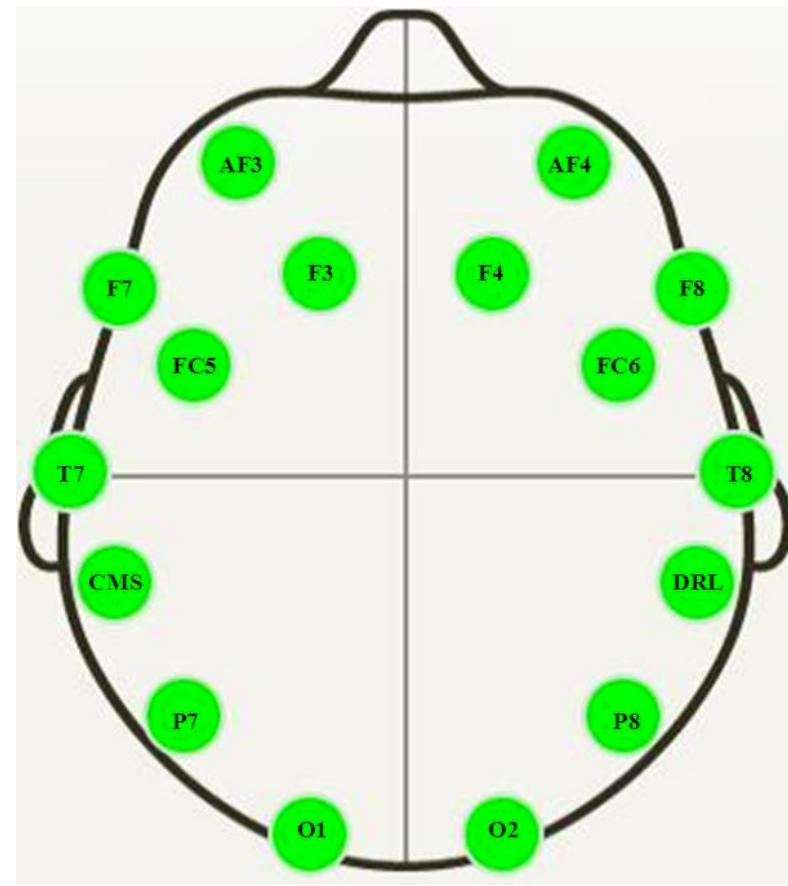
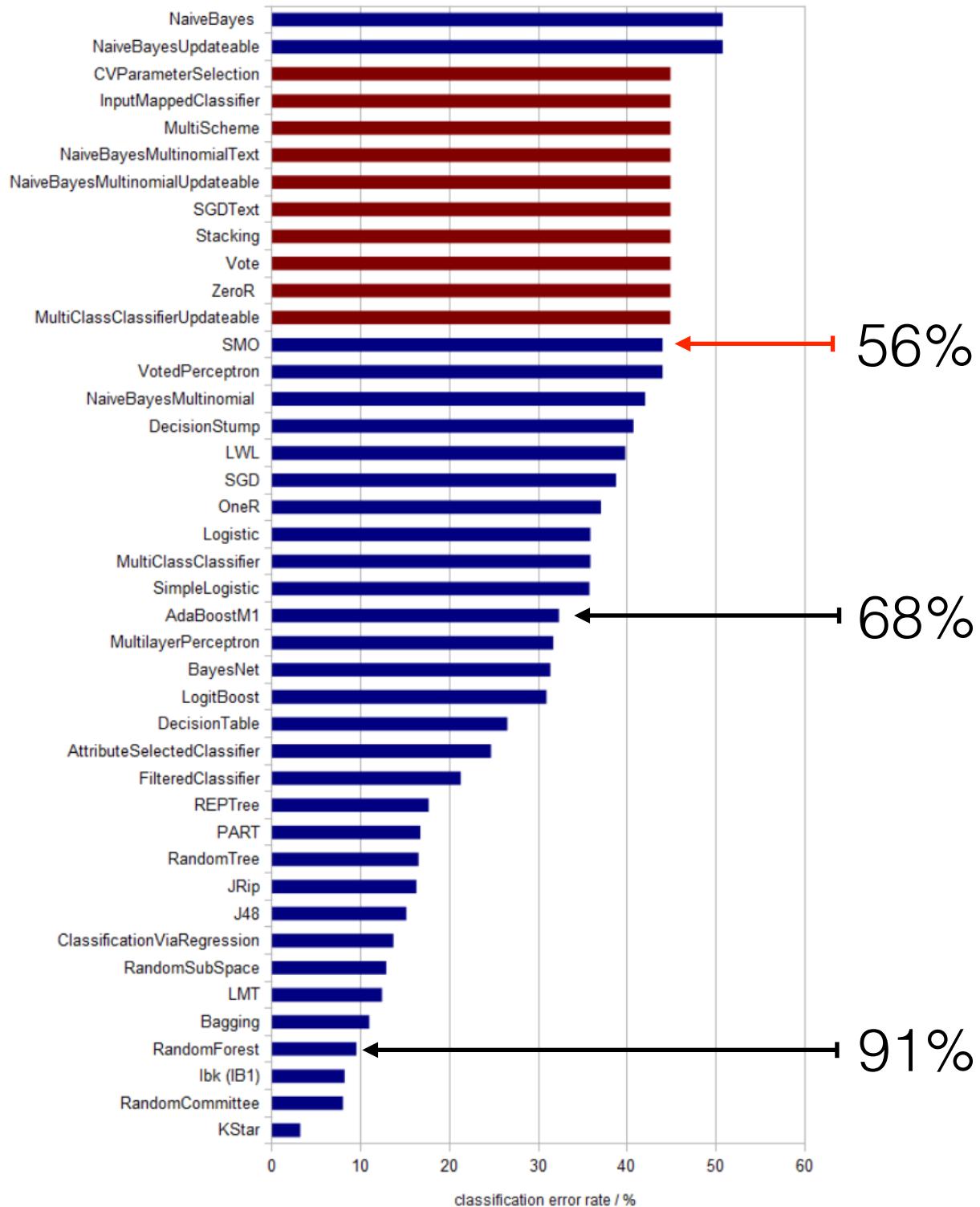


Eye State Prediction Using EEG

Jeff Ho
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EEG





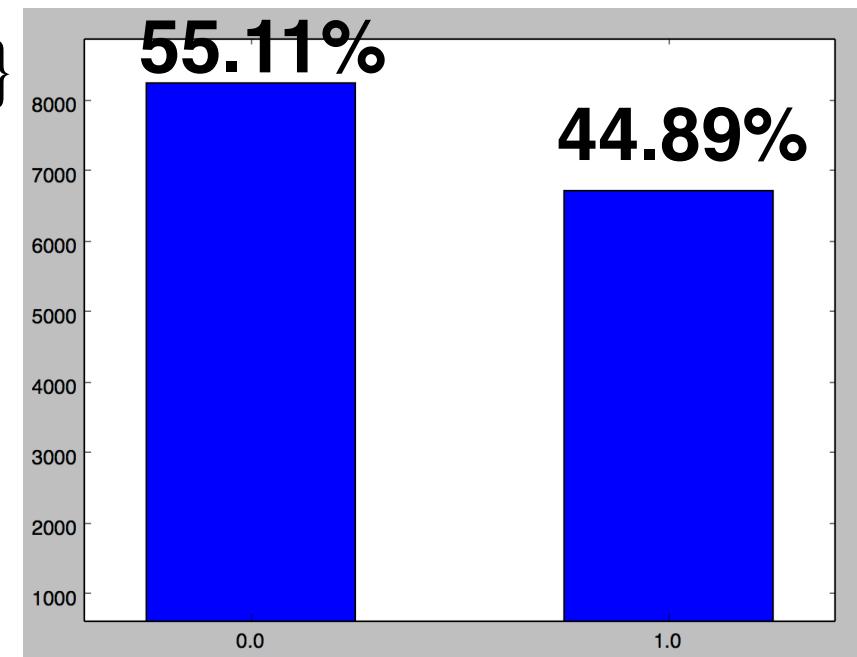
Oliver Roßler and
David Suendermann,
“A First Step towards
Eye State Prediction
Using EEG”, Baden-
Wuerttemberg
Cooperative State
University, 2014

Bad performance of
Support Vector
Machine

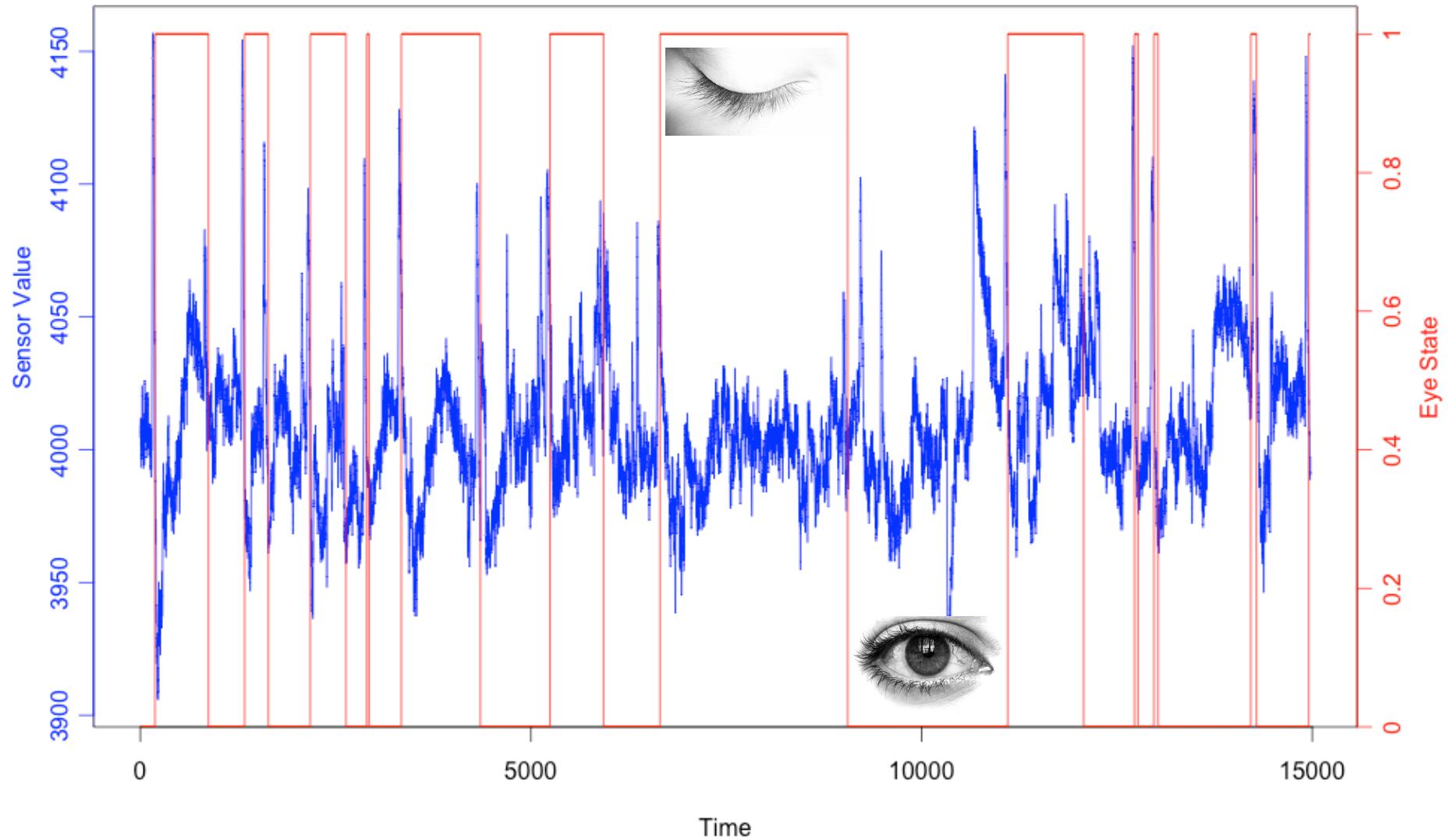
91%

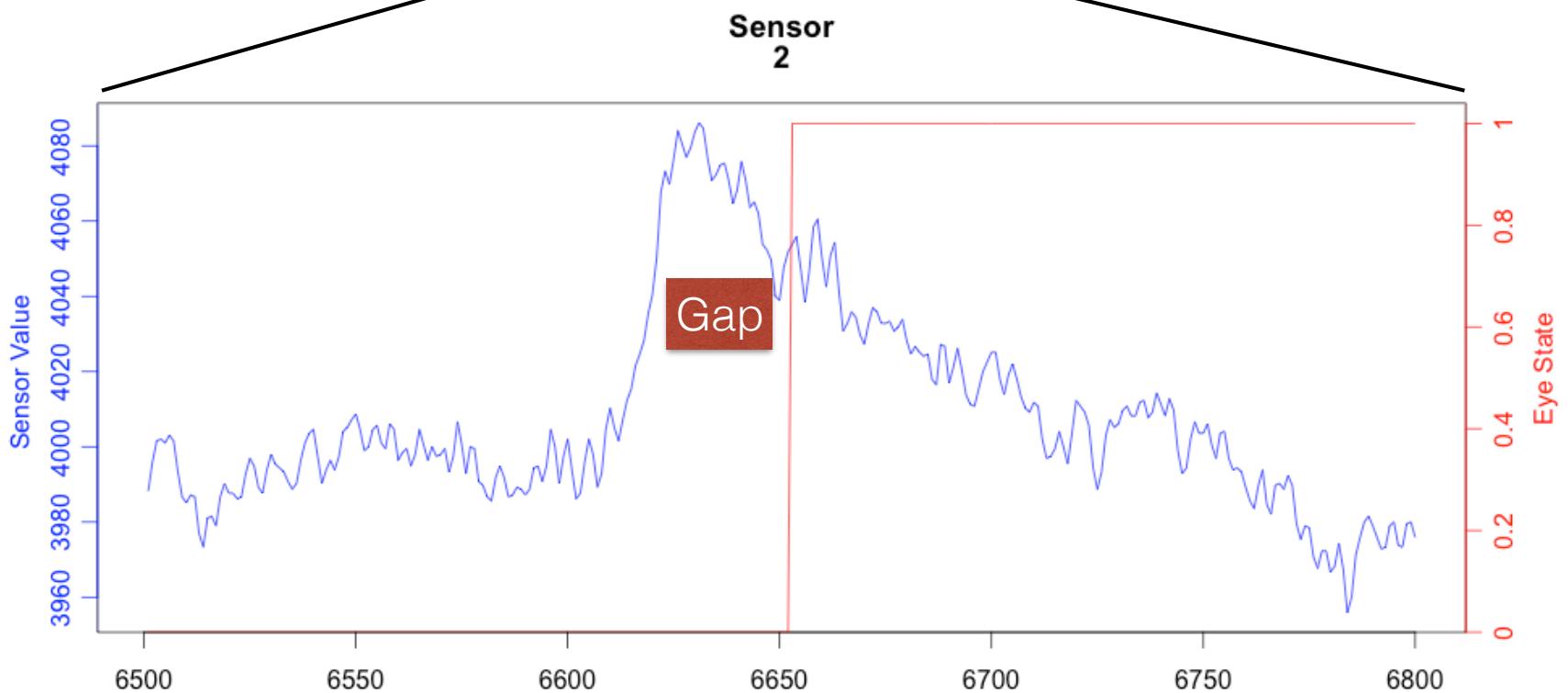
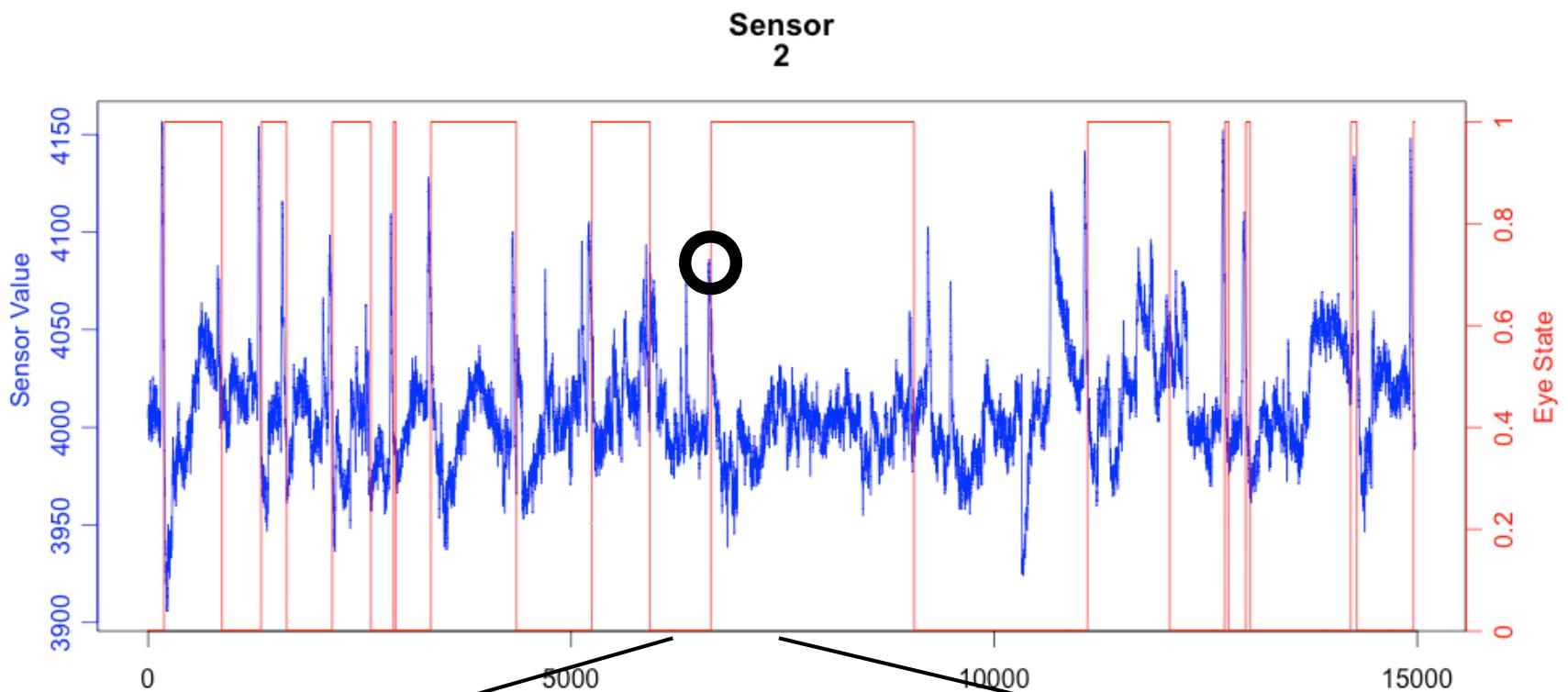
Data

- 117 seconds
- 14976 instances
- X_1, \dots, X_{14} , 14 features from 14 sensors
- $Y \sim \{0, 1\} = \{ \text{Open}, \text{Close} \}$



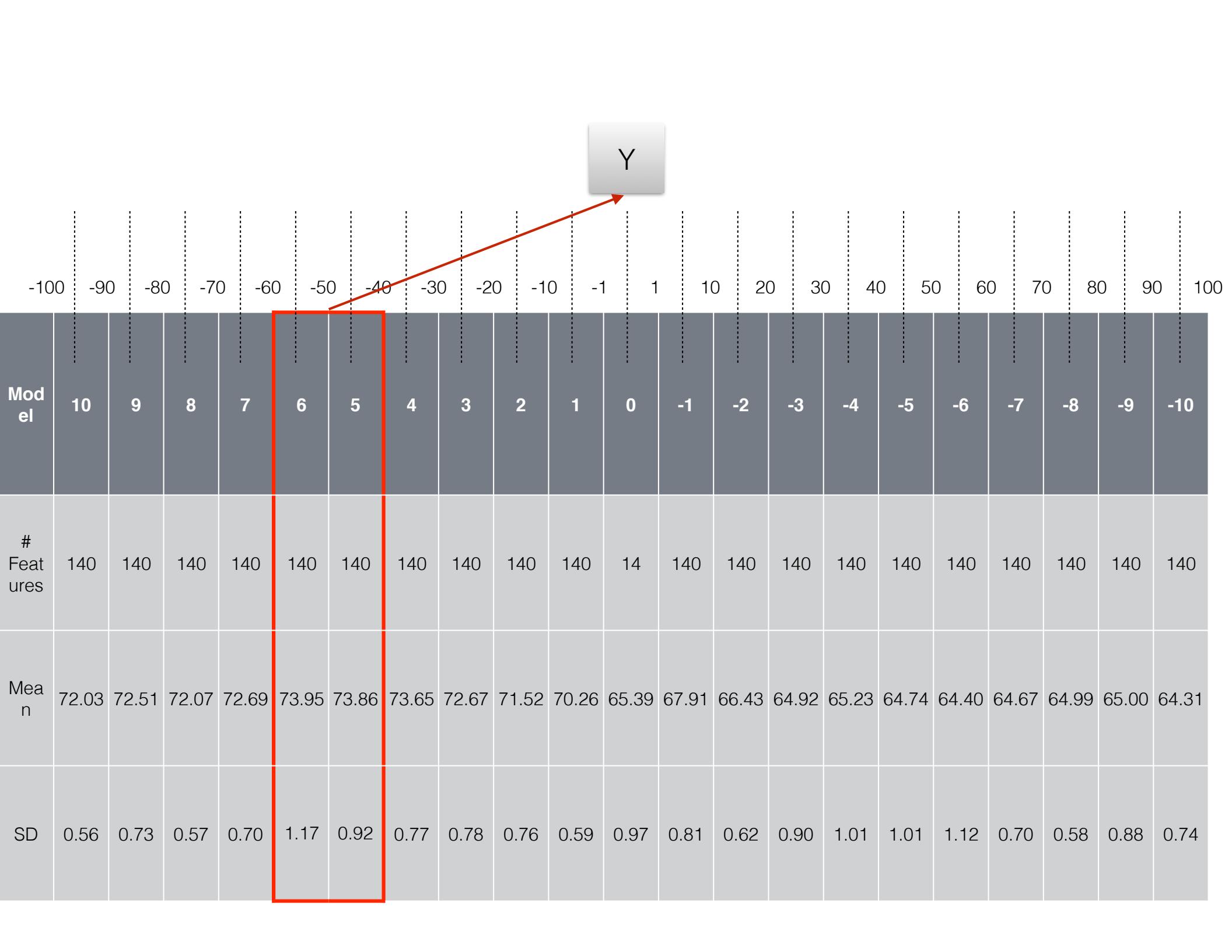
**Sensor
2**





Realign X & Y

- 117 seconds / 11976 instances = 0.0078125 seconds = 7.8125 milliseconds
- Brainwaves take a little time before action
- Realign features and label
- Linear SVM over different combinations
- Find sets have good predictive power



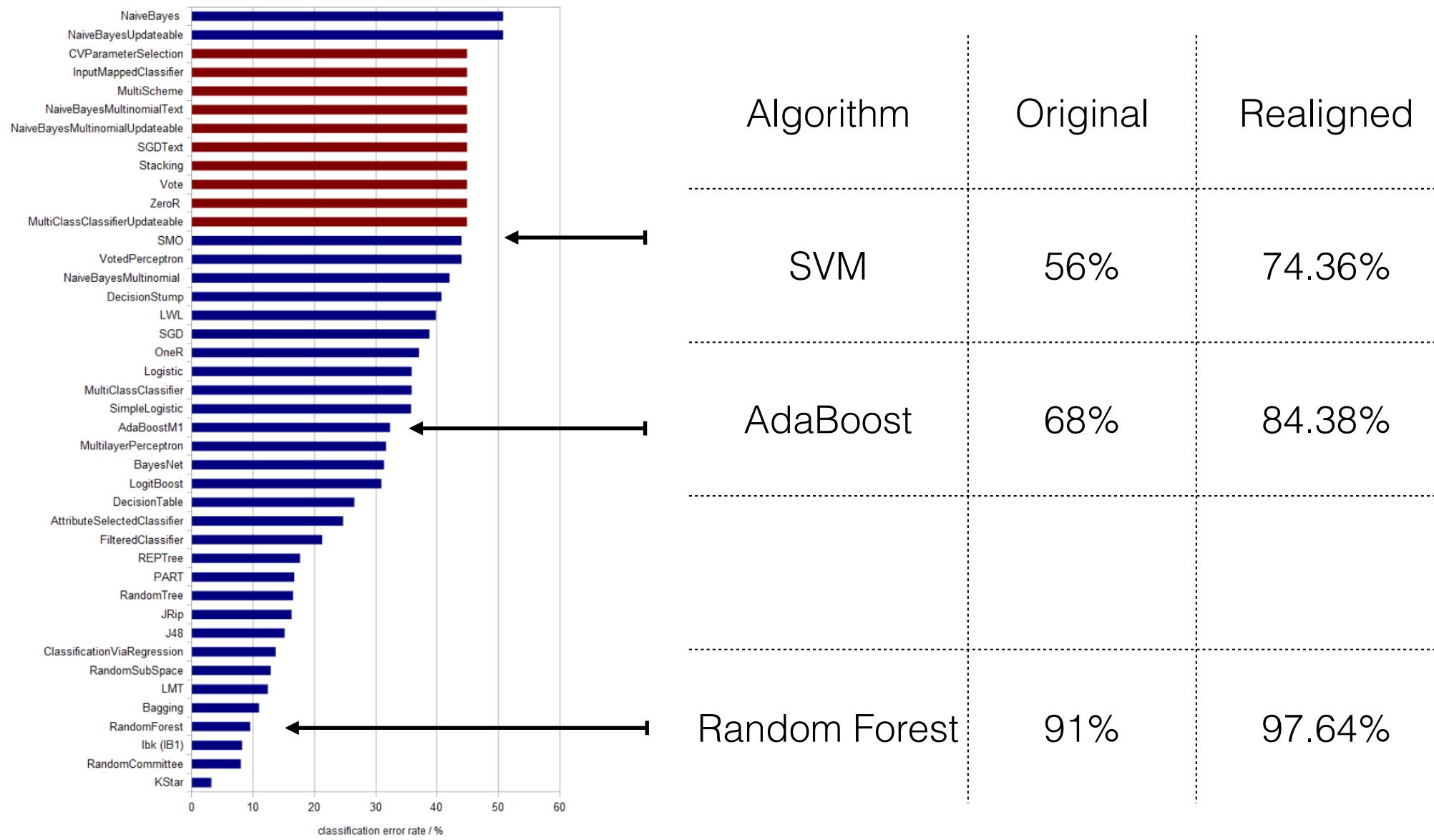
Evaluation

- Combine model 5 & 6
- Try different ML algorithms on **Model 21** (280 features)

Evaluation

Algorithm	Mean	SD	[25%, 50%, 75%]
SVM (Linear)	74.36	0.95	[74.08, 74.52, 74.68]
SVM (Polynomial, d=2)	70.32	0.65	[69.77, 70.41, 71.04]
SVM (Polynomial, d=3)	69.08	0.66	[68.50, 68.95, 69.41]
SVM (RBF)	55.67	0.64	[55.11, 55.85, 55.98]
AdaBoost (Tree)	84.38	0.73	[83.81, 84.12, 84.95]
Random Forest	97.64	0.33	[97.35, 97.69, 97.80]

Improvement



Thank you!