

Conclusions

Mice tend to irrationally 'stay' even during building evidence that the probabilities have changed. Our models were not able to capture this complicated behavior.

Ensemble methods (like Boosting and Random Forests) did not improve the accuracy of predicting switches.

While the classification models here have limitations, they still offered some insight into the information the animal could be using to make a decision:

- past reward outcomes (decreasing in value over time), which has been demonstrated previously in the field (both in mice and other animals during reinforcement learning tasks)
- the models also indicated that the timing of previous behavior carries some predictive power in determining a future decision.

Future directions

Are there other features we could include that carry predictive information?

Train models during learning, test on expert behavior. Similarly, train models during different timepoints of learning and compare beta coefficients.

Train models on different behavior paradigms (e.g. different reward probability pairs). Do mice adopt a general strategy in this task, or do they adapt to specific parameters.

Train models on different mice - do different mice learn to use different information to decide when to switch? Again, can train & test on different mice, or train on different mice and compare beta coefficients.