Feature Selection Analysis

Maximize ECR in RL

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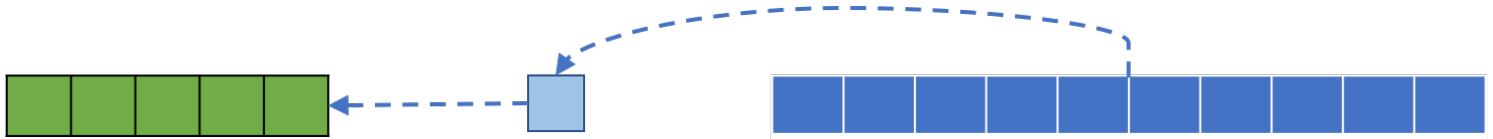
Wrapper Method

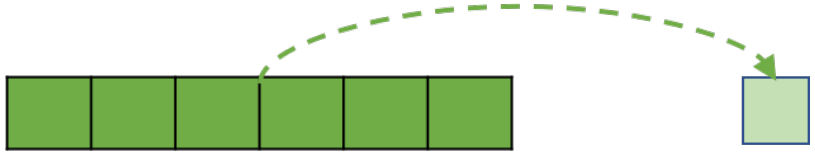
Greedy Forward-Backward Search (maximize ECR)

Three Phases In Each Iteration

Forward phase: Add one candidate feature to optimal feature set, and compute ECR



Backward phase: Remove one feature from optimal feature set and compute ECR



Pruning: Update optimal feature set by nested subset of highest ECR

Feature Manipulation

Discretization:

- Binary (Median split for all features except binary features)

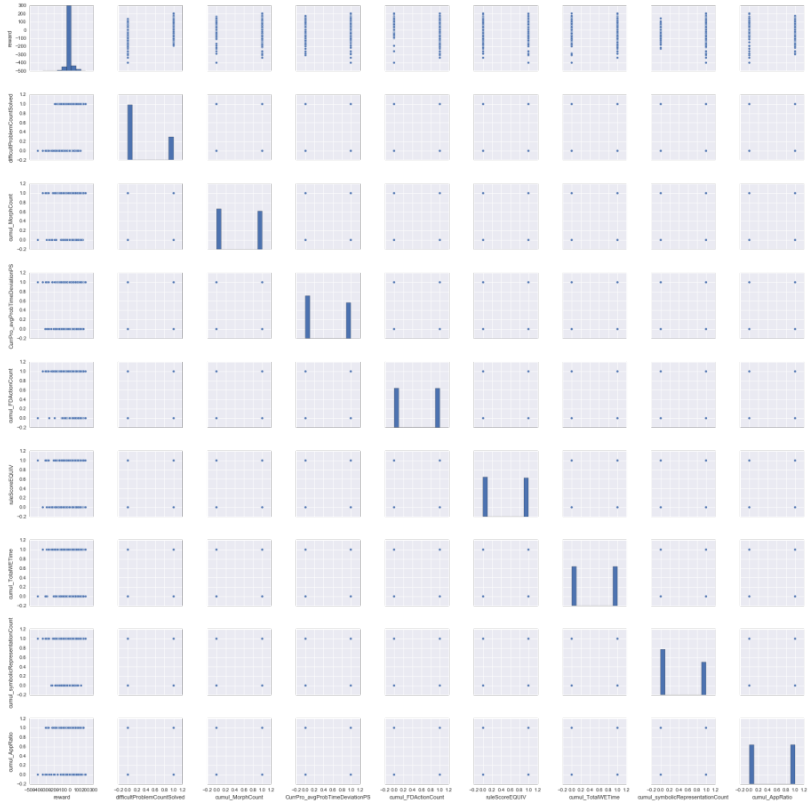
Selection heuristic rule:

- Ranked by ECR of each individual feature.
- Initialize optimal feature set with the highest ECR feature.
- Dynamically assign number of selected candidate features.

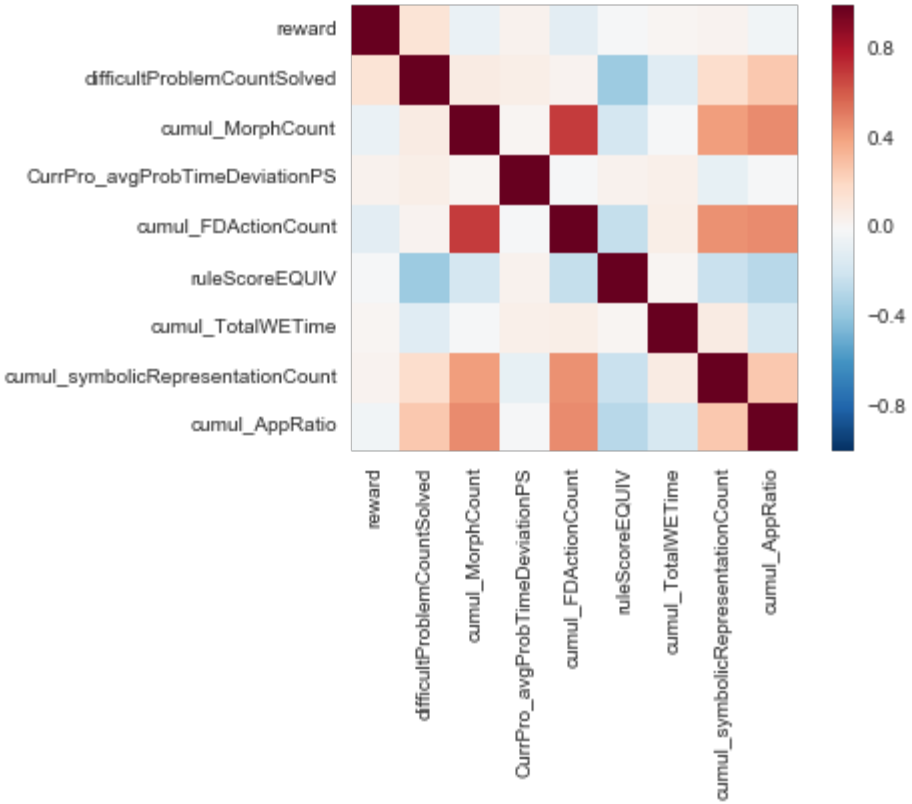
$$topK = \frac{|candidate\ feature\ set|}{2} + 0.01 \times \exp(|selected\ feature\ set|)$$

Optimal Feature Selection

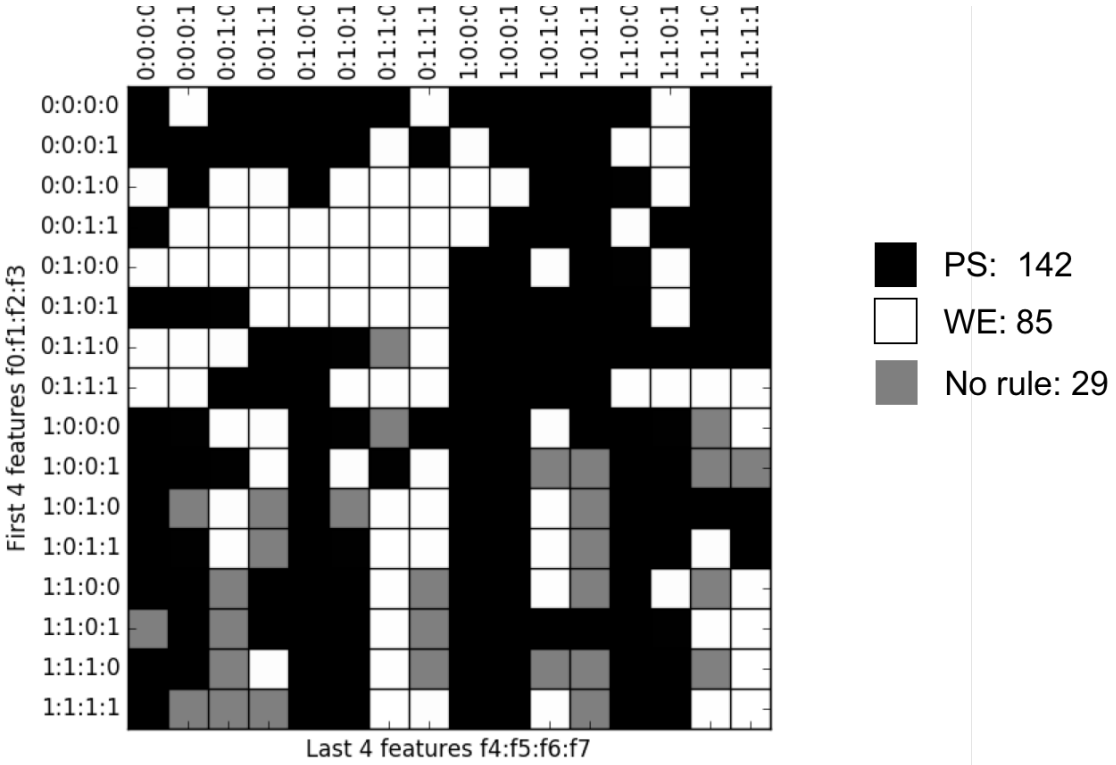
Reward and Feature Value Distribution



Reward and Feature Correlation



Policy Visualization



Best ECR and Reference

An Analysis of Feature Selection Techniques

Matthew Shardlow

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An Introduction to Variable and Feature Selection

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Good Luck to Everyone!
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