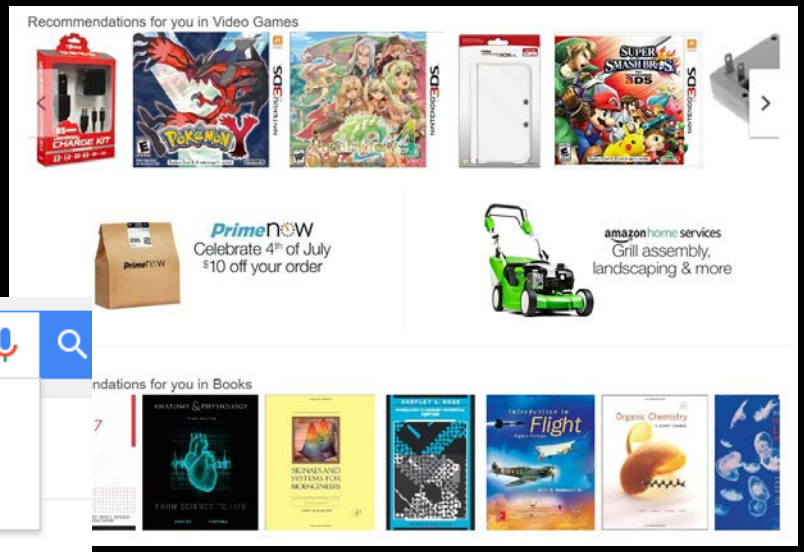
Poster #31

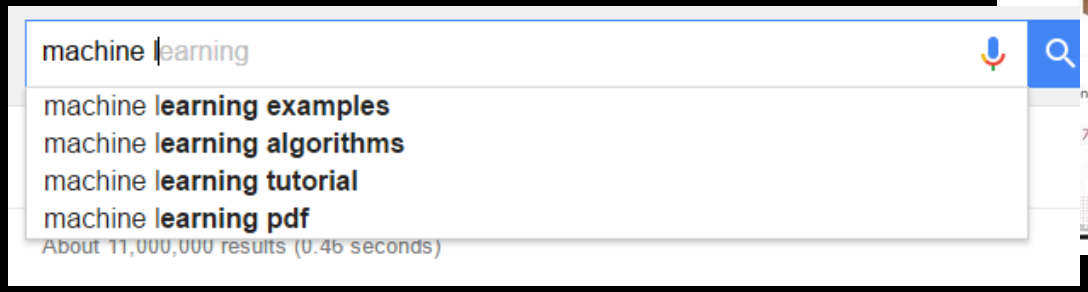
Low-Energy High-Performance Approximation System via Genetic Programming and Error-Aware Classification Model

Presenter: Sunny Kwok

BACKGROUND

- Machine learning is commonly seen in society
  - Real Life examples:
    - Online shopping
    - Fraud detection
    - Web searches





- Learning a strong fit within a finite range may require large amounts of calculations and processing
  - May be VERY ENERGY INTENSIVE

BACKGROUND

Machine Learning Model

General Model

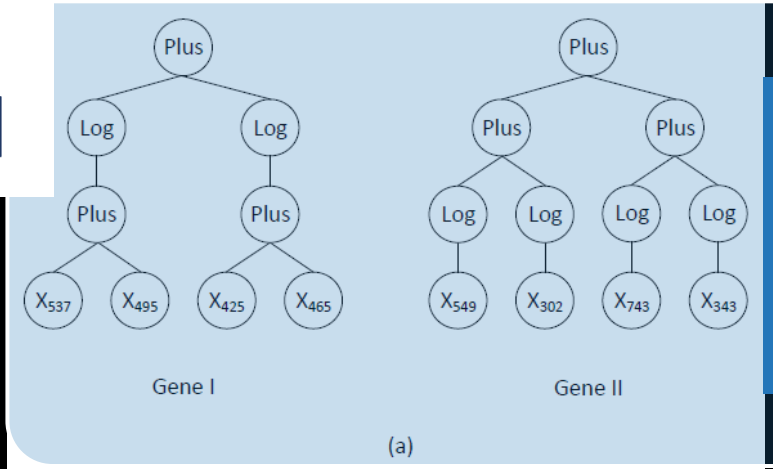
Input/output Data → Feature Extraction → Classification → Class Decision

Our Model

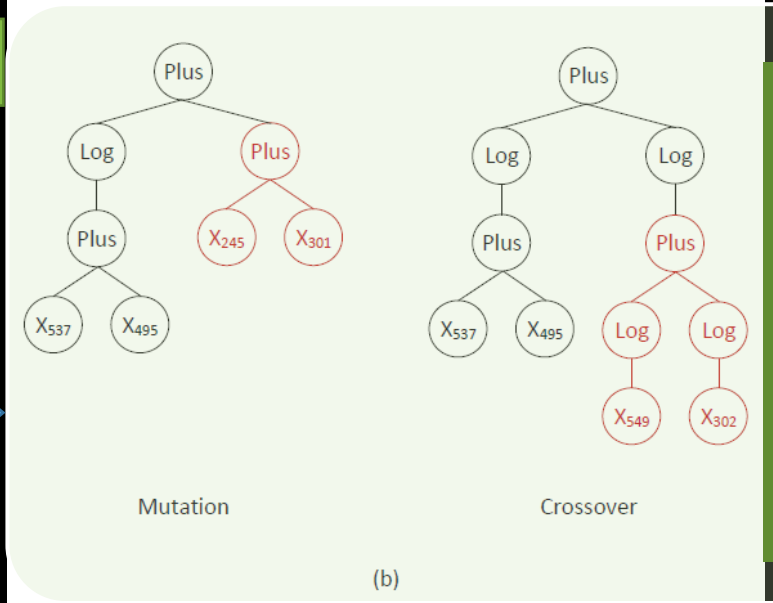
EEG Seizure Detection → GP Modeling → SVM → Seizure/Non-seizure

Sent Into

Produces



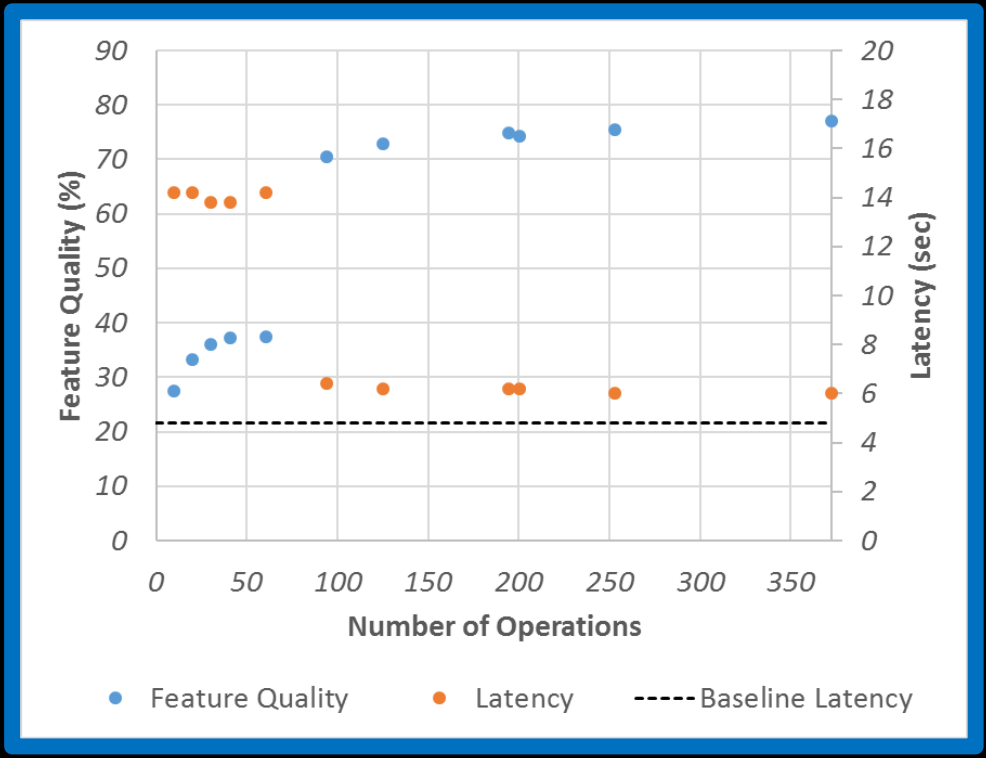
Extracted features consisted of a combination of these GENE TREES

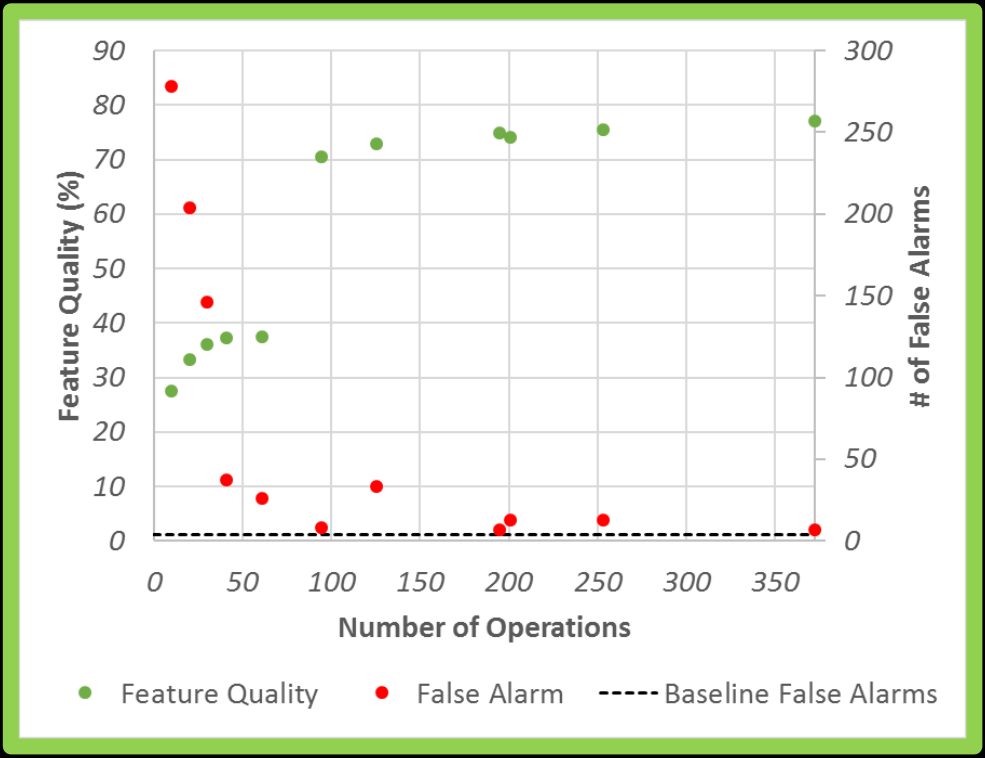


Over a set number of generations, evolution occurs to the “best” trees in the hopes of increasing feature quality

RESULTS

The GP models reach an almost baseline performance both in terms of latency and the number of false alarms





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