An Optimization Layer for Distributed Matrix Computations

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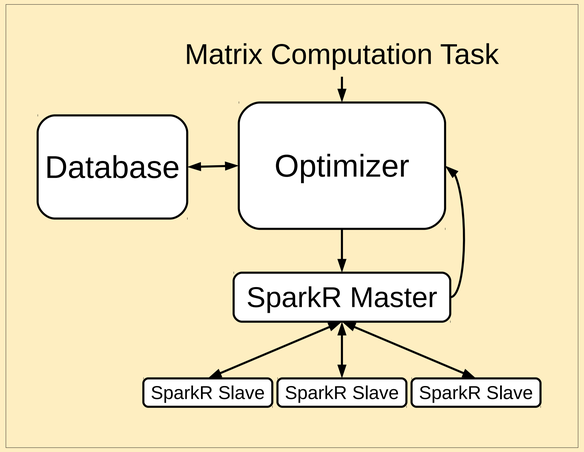
Background

- SparkR
  - Chooses parameters based on statistics from prior jobs
  - sdflksad
- Adaptive
  - sdfad
  - sdf
- DFC
  - sdfad
  - sdf



Motivation

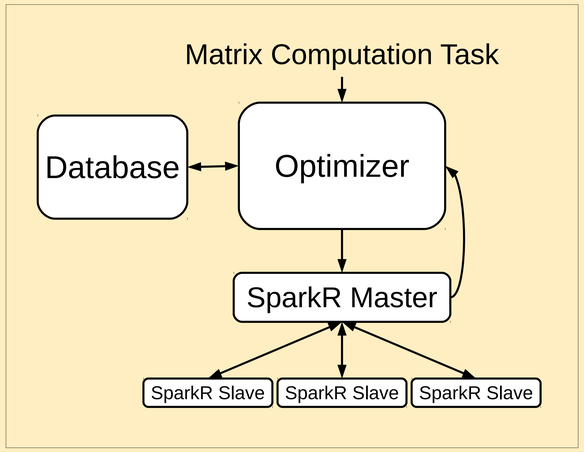
- Distributed machine learning algorithms
- Tradeoffs–time,cost,error
- optimize: humans are dumb as shit

Objective

Automate parameter choice for distributed matrix computations.

Optimizer Design

- Architecture-independent
  - Chooses parameters based on statistics from prior jobs
  - sdflksad
- Adaptive
  - sdfad
  - sdf
- Local-optimum Avoiding
  - sdfad
  - sdf



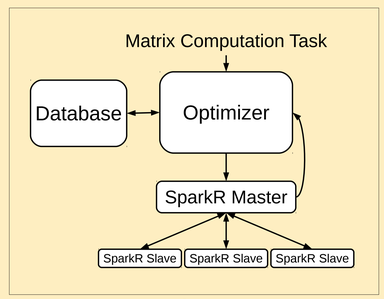
Implementation

- The words chosen by the adversary are hard,
  - But once you know theyre difficult it's easy to adjust.
- Top 12 words (probability of losing in 6 turns):

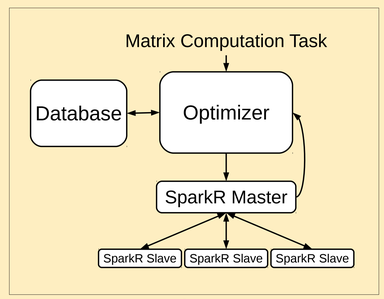
Evaluation

Can the AI determine the correct memory of a player?

- Generated data for players with restricted memory.
  - Extremely large number of samples required for AIC.
  - Can only implement model with memory parameters 1 through 3.
- Computed (corrected) AIC and BIC values
  - AIC consistently overestimates.
  - BIC consistently underestimates.
- Failure of AIC due to information available to player not captured by the model.



(a) AIC values.



(b) BIC values.

Figure : Plots of AIC and BIC Values against the Memory Parameter for a Dictionary Player with True Memory 2

Future Work

Achievements:

- Can learn a player's strategy assuming restricted memory.
- Can choose words that are hard for that player.
- Compiled a list of hard words for a dictionary-using frequency player.
  - Also hard for regular humans.

Future Work:

- Online Learning.
- Foiling an Adaptive Player.
  - Can we learn an adaptive strategy quickly and counter it?
  - Is there a Nash Equilibrium to the responses?

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