Strategy Card Game AI Competition

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Why Collectible Card Games?
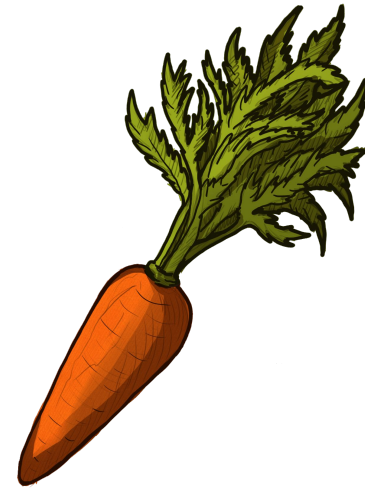
They are interesting!

For humans :-)
➜ (do I need to enumerate reasons...?)

For AI:
➜ Large branching factor, multi-action turns
➜ Lot of hidden information
➜ Huge amount of nondeterminism
➜ Yet the gameplay is still very strategical

Legends of Code and Magic

Competitions

One lane version
    Jul 2018 – CodinGame Sprint Contest (24h) – 742 participants
    Sep 2018 – CodinGame Marathon (30 days) – 2,174 participants

Two lanes version
    CEC 2019 – 6 entries (+2 baselines)
    COG 2019 – 9 entries (+2 baselines)
    CEC 2020 – 3 new entries (+10 previous agents)
    COG 2020 – 1 new entry + 3 CEC entries (+2 baselines)

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Current Entries

Chad, by Marcin Witkowski, Wojciech Meller, Łukasz Klasiński, Rust
   Draft: Card weights computed using harmony search
   Play: MCTS with prediction of opponent's hand

Coac (updated), by Victor Le, C++
   Draft: Predefined card evaluation function
   Play: Minimax-like search, depth max 3, alpha pruning
      Handmade evaluation function, random search for enemy turn

OneLaneIsEnough, by Maciej Falbogowski, C++
   Draft: Predefined card evaluation function
   Play: Almost full one-turn deep search with opponent answer
      Evaluation based on linear combination of features

ReinforcedGreediness, by Ronaldo Vieira, Luiz Chaimowicz, Anderson Tavares, Python
   Draft: Neural networks learned by self-play
   Play: One-turn deep best-first search using linear combination of features

Evaluation

Every two agents were compared using 250 decks, ten games each. All games with the same deck had the same random seed, resulting in an identical card ordering.

All participants source code available at
github.com/acatai/Strategy-Card-Game-AI-Competition

Results

Results

Place	Player	Wins
1	Chad	79.99%
2	Coac	74.68%
3	OneLaneIsEnough	59.49%
4	ReinforcedGreediness	56.21%
5	Baseline2	16.70%
6	Baseline1	12.94%

vs.	Chad	Coac	OneLaneIsEnough	Reinforced Greediness
Chad		42.76%	69.20%	98.00%
Coac	57.24%		56.43%	65.97%
OneLaneIsEnough	30.80%	43.57%		45.61%
Reinforced Greediness	2.00%	34.03%	54.39%	
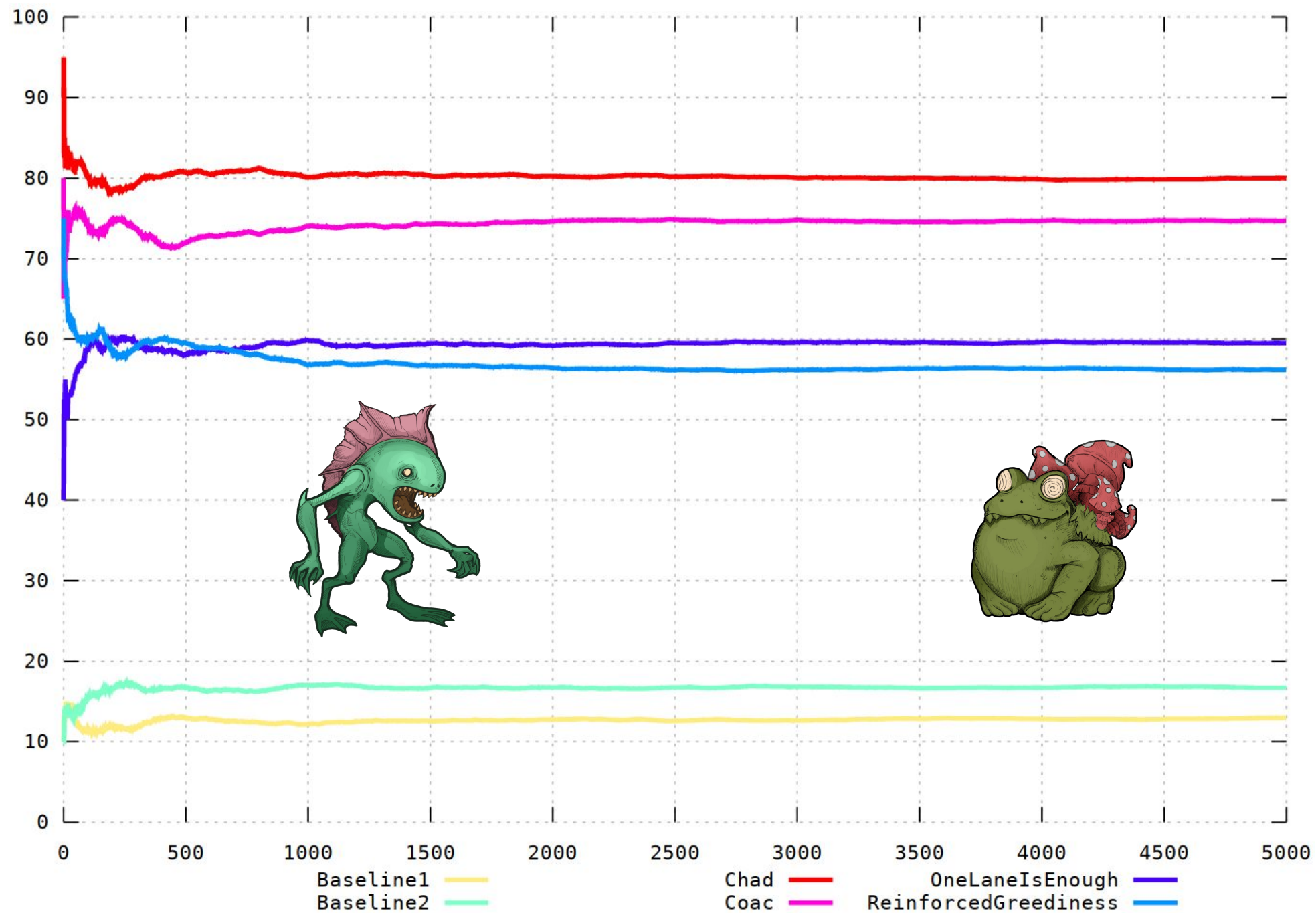
Future

Next years:
➔ Extended game mechanics
➔ Procedurally generated sets of cards
➔ OpenSpiel implementation

The Winner

Chad
by
Marcin Witkowski, Wojciech Meller, Łukasz Klasiński
(our brand new champion)

Congratulations!!!

Second place: **Coac**
Third place: **OneLaneIsEnough**