

Strategy Card Game AI Competition



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Legends of Code and Magic



LegendsOfCodeAndMagic.com

Legends of Code and Magic 1.2

LegendsOfCodeAndMagic

Creatures: 17
Green Items: 1
Red Items: 3
Blue Items: 0

Draft: 21/30

Creatures: 20
Green Items: 0
Red Items: 1
Blue Items: 0

aCat

Draft Phase
Arena mode

LegendsOfCodeAndMagic

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Battle Phase

LegendsOfCodeAndMagic.com

Competitions



One lane version (LOCM 1.0)

Jul 2018 – CodinGame Sprint Contest (24h) – 742 participants

Sep 2018 – CodinGame Marathon (30 days) – 2,174 participants

Two lanes version (LOCM 1.2)

CEC 2019 – 6 entries (+2 baselines)

COG 2019 – 9 entries (+2 baselines)

CEC 2020 – 3 new entries (+10 previous agents)

COG 2020 – 1 entry + 3 CEC entries (+2 baselines)

CEC 2021 – no new entries

COG 2021 – 5 new entries

Constructed version (LOCM 1.5)

COG 2022 – 6 new entries

Multiple entries uses [gym-locm](#):

OpenAI Gym environment for LOCM created by

Ronaldo Vieira, Anderson Rocha Tavares, and Luiz Chaimowicz

New Entries

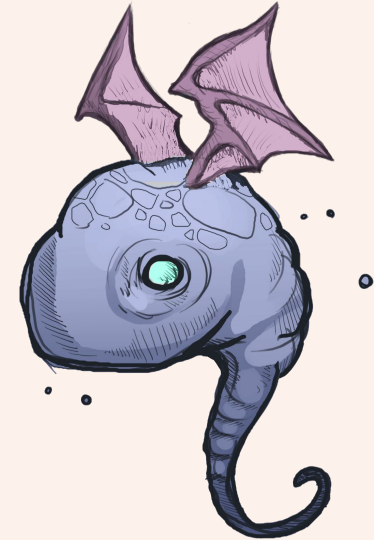
ByteRL, by [Wei Xi](#), [Yongxin Zhang](#), [Fuming Wang](#), [Haowei Liang](#), [Peng Sun](#), Python
Single agent solution. Policies for both phases learned end-to-end via Fictitious Self-Play and Deep Reinforcement Learning.
Training done with the author's proprietary RL framework (planned to be released as open-source).

Inspirai, by [Rujie Zhong](#), [Junran Xie](#), [Wenjie Pang](#), Python
Score function (based on Coac player) for deck construction.
Self-play NN training using PPO.



MugenSlayerAttackOnDuraraBallV3, by [Athar](#), [Zu Hyun](#), [Mohamed](#), Python
Only uses "area" cards.
Partially predefined playing strategy (spells/creatures ordering and targeting).
Statistic-based card scoring system with self-made weights.

New Entries



NeteaseOPD

Jianming Gao, Yunkun Li, Yali Shangguan, Zhaohao Liang (Netease Game OPD), Python
PPO and self-play to train policies for both phases.
The authors updated gym environment to LOCM version 1.5.

USTC gogogo

Lu YuDong, Zhao Jian (University of Science and Technology of China), Python
Two bots submitted: after preliminary games, better used for the final competition.
Hyperparameters for the card selection phase, playing phase based on RL model.

Zylo, by Daniel Górski, Java


Heuristic-based search with random move sampling.
Evolutionary algorithm for parameter tuning.

Results

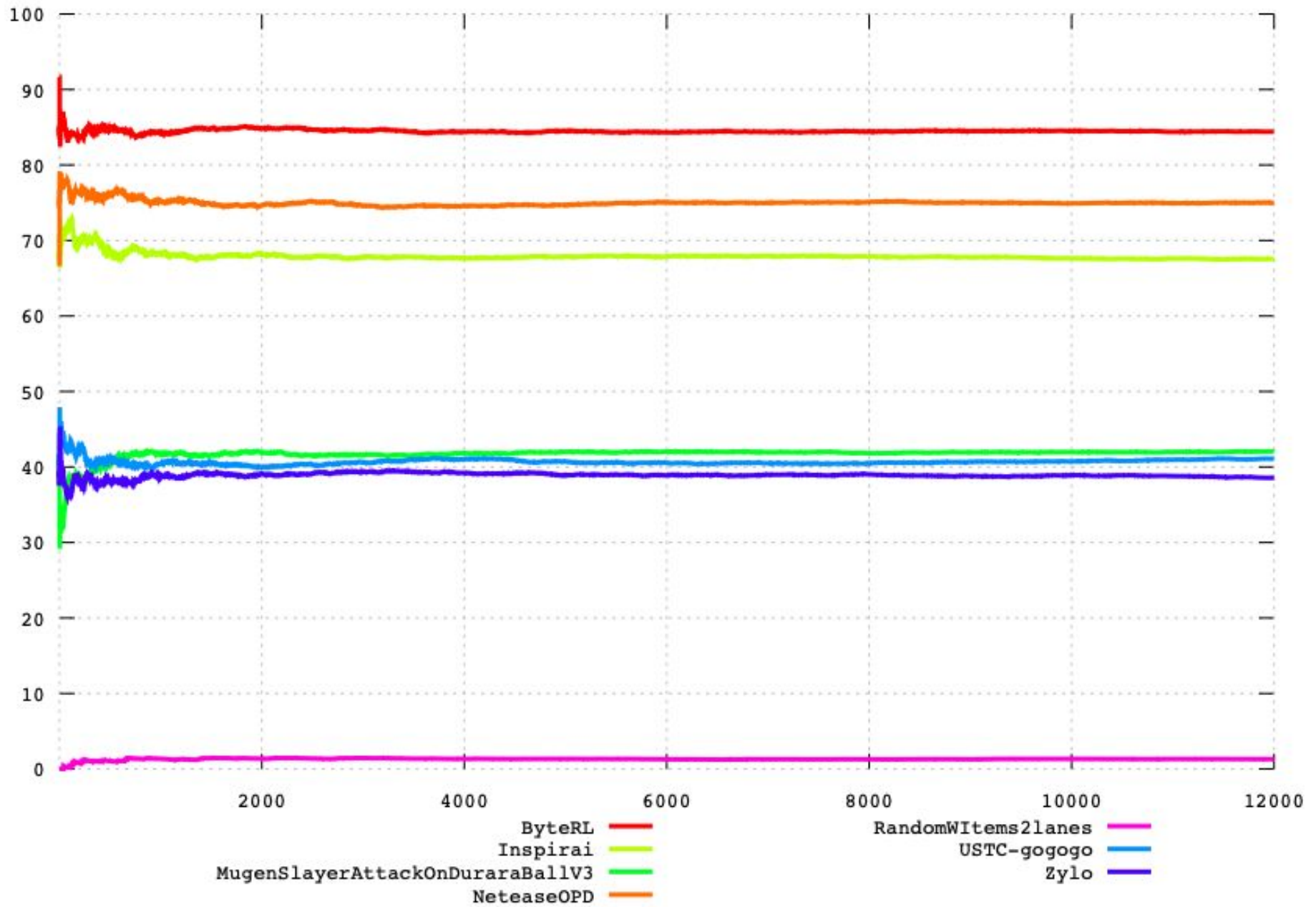


Results



Place		Player	Wins
1		ByteRL	84.41%
2		NeteaseOPD	75.00%
3		Inspirai	67.57%
4		MugenSlayerAttackOnDuraraBallV3	42.04%
5		USTC-gogogo (Zero_control)	41.09%
6		Zylo	38.60%
7		<i>RandomWItems2lanes</i>	1.29%

Detailed results, game statistics, and player data available at github.com/acatai/Strategy-Card-Game-AI-Competition



Bonus 1.2 Run: Results

Place	Player	Wins
1	ByteRL	94.56%
2	DrainPowerAggressive	73.64%
3	DrainPower	73.53%
4	Coac	68.23%
5	Chad	67.90%
6	OneLanelEnough	54.80%
7	ReinforcedGreediness	51.31%
8	LANE_1_0	34.57%
9	<i>Baseline1</i>	21.95%
10	<i>Baseline2</i>	20.82%
11	AdvancedAvocadoAgent	20.76%
12	Ag2O	17.94%



The Winner



ByteRL

by

Wei Xi, Yongxin Zhang, Fuming Wang,
Haowei Liang, Peng Sun
(double champion for LOCM 1.5 and LOCM 1.2)

Congratulations!!!

Second place: **NeteaseOPD**

Third place: **OneLanelEnough**