SEUNGCHAN KIM

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Education & Background	**Brown University**, Providence, RI

Brown University, Providence, RI
- M.S. in Computer Science — 09/2019 - 05/2020
- B.S. in Applied Mathematics and Computer Science — 09/2013 - 05/2019
- GPA: 3.93/4.0, *Magna Cum Laude*

Signal Intelligence Research Lab, Republic of Korea Army — 09/2015 - 06/2017

Peer-Reviewed Publications

[1] **Seungchan Kim**, Kavosh Asadi, Michael Littman, George Konidaris.
DeepMellow: Removing the Need for a Target Network in Deep Q-Learning.
Proceedings of the 28th International Joint Conference on Artificial Intelligence (IJCAI).

Refereed Workshop Papers, Extended Abstracts

[2] **Seungchan Kim**, George Konidaris.
Adaptive Temperature Tuning for Mellowmax in Deep Reinforcement Learning. *Neural Information Processing Systems (NeurIPS) 2019 Deep RL Workshop.*

[3] **Seungchan Kim**, Kavosh Asadi, Michael Littman, George Konidaris.
Removing the Target Network from Deep Q-Networks with the Mellowmax Operator. *Proceedings of the 18th International Conference on Autonomous Agents and Multiagent Systems (AAMAS).*

[4] **Seungchan Kim**, Kavosh Asadi, Michael Littman, George Konidaris.
DeepMellow: Removing the Need for a Target Network in Deep Q-Learning.
The 4th Conference on Reinforcement Learning and Decision Making (RLDM).

Preprints & Manuscripts

[5] Arthur Wandzel, **Seungchan Kim**, Stefanie Tellex, Yoonseon Oh.
OO-POMCP: Robust Multi-Object Planning for Object-Oriented POMDPs.
Manuscript, in preparation for a submission to IJCAI 2020.

[6] Kavosh Asadi, Dipendra Misra, **Seungchan Kim**, Michael Littman.
Combating the Compounding-Error Problem with a Multi-step Model.
arXiv:1905.13320[cs.LG]. In preparation for a submission to ICML 2020.

[7] Dima Amso, Lakshmi Narashimhan Govindarajan, Pankaj Gupta, Heidi Baumgartner, Andrew Lynn, Kelley Gunther, Diego Placido, Tarun Sharma, Vijay Veerabadran, Kalpit Thakkar, **Seungchan Kim**, Thomas Serre.
Discovering Developmental Mechanisms of Memory-Guided Attention using Computer Vision. *Under review at Neuron.*

[8] Akhil Bagaria, **Seungchan Kim**, Alessio Mazzetto, Rafael Rodriguez-Sanchez.
[Replication] A Unified Bellman Optimality Principle Combining Reward Maximization and Empowerment.
Under review at NeurIPS 2019 Reproducibility Challenge.

Research Experience

Intelligent Robot Lab, Brown University
Researcher (Advisor: Prof. George Konidaris) — 09/2017 - Present
- Developed a more stable deep Q-learning algorithm without a target network by using an alternative softmax operator, Mellowmax [1,3,4].
- Devising an adaptive, online algorithm that tunes the temperature hyperparameter of Mellowmax, using meta-gradient reinforcement learning approach [2].

	Reinforcement Learning and Adaptive Behavior Group, Brown University
	Researcher (Advisor: Prof. Michael Littman) 09/2018 - 08/2019

Reinforcement Learning and Adaptive Behavior Group, Brown University
Researcher (Advisor: Prof. Michael Littman)   09/2018 - 08/2019
- Conducted experiments for a new multi-step model-based reinforcement learning algorithm to tackle a compounding-error problem [6].

Humans to Robot Lab, Brown University
Researcher (Advisor: Prof. Stefanie Tellex)   12/2018 - Present
- Theoretically and empirically analyzed the sample efficiency of factored-belief and object-oriented partially observable Monte Carlo planning algorithm [5].

Serre Lab, Brown University
Research Assistant (Advisor: Prof. Thomas Serre)   07/2017 - 05/2019
- Conducted research on memory-guided visual attentions of 4-to-9 year-old children in a naturalistic environment, smart-playroom [7].
- Analyzed visual salience of video data using a Faster R-CNN model.

Invited Talk

An Alternative Softmax Operator for Deep Reinforcement Learning
Machine Intelligence Community (MIC) Conference   09/2019
(Student-led conference co-hosted by Harvard, MIT, and Boston University.)

Advanced Course Projects

CS2951F Learning and Sequential Decision Making   09/2019 - 12/2019
Replicated the empirical results of a recently published NeurIPS conference paper (Leibfried et al. 2019). Implemented empowered & intrinsically motivated actor-critic algorithm, and compared its performance with soft actor-critic, deep deterministic policy gradients, and proximal policy optimization baselines on MuJoCo domains. Submitted the final report to NeurIPS 2019 Reproducibility Challenge [8].

CS2470 Deep Learning   09/2019 - 12/2019
Proposed a new technique to model the second language acquisition patterns in online educational platform, Duolingo. Captured the students' knowledge over time using transformers, and predicted when they will make errors while answering exercises.

CS2951K Collaborative Robotics   01/2018 - 05/2018
Designed and implemented a 3D block-stacking simulated domain for a hierarchical planning algorithm. Showed that Abstract Markov Decision Process (AMDP) planner significantly outperforms Bounded-RTDP baseline planner in the domain.

TA Experience

CS1430 Computer Vision	01/2019 - 05/2019
CS0040 Scientific Computing and Problem Solving	01/2015 - 05/2015
EN0040 Dynamics and Vibrations	01/2015 - 05/2015

Technical Skills

Python, C, Java, Matlab, Scala, Tensorflow, PyTorch, Keras, LaTeX, Unix/Linux

Academic Service

Reviewer
- NeurIPS 2019 Workshop on Machine Learning for Health
- NeurIPS 2019 Workshop on Machine Learning and the Physical Sciences