HYUNJAE WOO

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RESEARCH INTERESTS

My research interest is in the intersection of deep learning and reinforcement learning (RL) and its various real-world applications such as robotics. Specifically, I am interested in building efficient and task-agnostic intelligent machine through hierarchical RL and meta-learning.

EDUCATION

University of Michigan - Ann Arbor *Sep 2013 - Present*
B.S.E. in Computer Science & Engineering
GPA: 3.3/4.0

PUBLICATIONS

Meta Reinforcement Learning with Autonomous Task Inference
Sungryull Sohn, **Hyunjae Woo**, Jongwook Choi, Honglak Lee
Deep RL Workshop on Neural Information Processing Systems (NeurIPS), 2019

RESEARCH EXPERIENCE

Deep Learning Lab @ Univ. of Michigan *Oct 2018 - Present*
Undergraduate Research Assistant
Advisor: Honglak Lee

Participated in a research on *meta-hierarchical RL* agent that can explicitly infer the underlying task structures and thus efficiently generalize over unseen tasks.

Reinforcement Learning Lab @ Univ. of Michigan *Oct 2017 - Sep 2018*
Undergraduate Researh Assistant
Advisor: Satinder Singh

Participated in a research project on tackling StarCraft II Learning Environment (SC2LE) using various deep reinforcement learning algorithms such as A2C and Option-Critic.

Vision and Learning Lab @ Seoul National Univ. *May 2017 - Aug 2017*
Summer Research Intern
Advisor: Gunhee Kim

Participated in a research on *personalized* image captioning and *non-task oriented (or conversational)* dialogue systems.

WORK EXPERIENCE

University of Michigan Transportation Research Institute *Jan 2019 - May 2019*
Undergraduate Research Assistant

Participated in a research on improving lane detection accuracy through LiDAR dataset analysis.

Seoul Metropolitan Police Agency - Foreign Affairs Dept. *Apr 2014 - Dec 2015*
Sergeant

Completed the military duty as an auxiliary-police.

SOFTWARE PROJECTS

Automatic Fire Detection

Developed an object-detection algorithm that detects the instance of fire in the video using YOLO-v2 trained with fire image datasets.

Facial-Image Sentiment Classification

Analyzed the facial image dataset through K-means algorithm and implemented autoencoder and convolutional neural networks (CNN) for classification.

Recycle.it

Developed a eco-friendly, camera-based progressive web application using React.js. The application scans a barcode of a product and informs the user with helpful recycling information.

TSP with Approximation and Optimization Algorithm

Implemented MST approximation and Branch-and-Bound optimization algorithms to several Traveling Salesman Problems (TSP) to create an optimal curcuit path to all the nodes.

RELEVANT COURSES

Core Courses	**Other Courses**
EECS498: Reinforcement Learning	MATH217: Linear Algebra
EECS442: Intro to Computer Vision	MATH451: Advanced Calculus
EECS445: Intro to Machine Learning	MATH425: Intro to Probability
EECS492: Intro to Artificial Intelligence	MATH412: Intro to Modern Algebra

TECHNICAL SKILLS

Software & Frameworks	Linux/Unix, Tensorflow, PyTorch
Programming Languages	Python, C/C++, C#, Javascript