

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)

*resolved military service duty

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 Research 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.

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 circuit path to all the nodes.

RELEVANT COURSES

Core Courses

EECS498: Reinforcement Learning
EECS442: Intro to Computer Vision
EECS445: Intro to Machine Learning
EECS492: Intro to Artificial Intelligence

Other Courses

MATH217: Linear Algebra
MATH451: Advanced Calculus
MATH425: Intro to Probability
MATH412: Intro to Modern Algebra

TECHNICAL SKILLS

Software & Frameworks Programming Languages

Linux/Unix, Tensorflow, PyTorch
Python, C/C++, C#, Javascript