

# HYUNJAE WOO

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## RESEARCH INTERESTS

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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

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**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

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**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

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**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

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**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

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### 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

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### 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

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### Software & Frameworks

Linux/Unix, Tensorflow, PyTorch

### Programming Languages

Python, C/C++, C#, Javascript