

# JUNHYUK OH

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## EMPLOYMENT

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### DeepMind

Research Scientist

June 2018 - Present

London, United of Kingdom

### DeepMind

Research Intern

Advisor: David Silver

June 2017 - Sep 2017

London, United of Kingdom

### Microsoft Research

Research Intern

Advisor: Pushmeet Kohli

June 2016 - Sep 2016

Redmond, WA

### ESTSoft, Inc

Software Engineer

June 2011 - Jan 2013

Seoul, Korea

### GALA Lab, Inc

Software Engineer

Jan 2010 - June 2011

Seoul, Korea

## EDUCATION

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### University of Michigan, Ann Arbor

Ph.D. in Computer Science & Engineering

Advisor: Honglak Lee, Satinder Singh

Sep 2014 - May 2018

### Seoul National University

B.S. in Computer Science & Engineering

GPA: 4.05/4.3 (ranked 1<sup>st</sup> out of 46 CS students)

Mar 2007 - Feb 2014

## PUBLICATIONS

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### Balancing Constraints and Rewards with Meta-Gradient D4PG

Dan A. Calian\*, Daniel J Mankowitz\*, Tom Zahavy, Zhongwen Xu, **Junhyuk Oh**, Nir Levine, Timothy Mann.

In *International Conference on Learning Representations (ICLR)*, 2021.

### Pick Your Battles: Interaction Graphs as Population-Level Objectives for Strategic Diversity

Marta Garnelo, Wojciech Marian Czarnecki, Siqi Liu, Dhruva Tirumala, **Junhyuk Oh**, Gauthier Gidel, Hado van Hasselt, David Balduzzi.

In *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, 2021.

### Discovering Reinforcement Learning Algorithms

**Junhyuk Oh**, Matteo Hessel, Wojciech M. Czarnecki, Zhongwen Xu, Hado van Hasselt, Satinder Singh, David Silver.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020.

### Meta-Gradient Reinforcement Learning with an Objective Discovered Online

Zhongwen Xu, Hado van Hasselt, Matteo Hessel, **Junhyuk Oh**, Satinder Singh, David Silver.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020.

### **A Self-Tuning Actor-Critic Algorithm**

Tom Zahavy, Zhongwen Xu, Vivek Veeriah, Matteo Hessel, **Junhyuk Oh**, Hado van Hasselt, David Silver, Satinder Singh.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2020.

### **What Can Learned Intrinsic Rewards Capture?**

Zeyu Zheng\*, **Junhyuk Oh\***, Matteo Hessel, Zhongwen Xu, Manuel Kroiss, Hado van Hasselt, David Silver, Satinder Singh.

In *Proceedings of the 37th International Conference on Machine Learning (ICML)*, 2020.

### **Grandmaster level in StarCraft II using multi-agent reinforcement learning**

Oriol Vinyals\*, Igor Babuschkin\*, Wojciech M Czarnecki\*, Michaël Mathieu\*, Andrew Dudzik\*, Junyoung Chung\*, David H Choi\*, Richard Powell\*, Timo Ewalds\*, Petko Georgiev\*, **Junhyuk Oh\***, Dan Horgan\*, Manuel Kroiss\*, Ivo Danihelka\*, Aja Huang\*, Laurent Sifre\*, Trevor Cai\*, John P Agapiou\*, Max Jaderberg, Alexander S Vezhnevets, Rémi Leblond, Tobias Pohlen, Valentin Dalibard, David Budden, Yury Sulsky, James Molloy, Tom L Paine, Caglar Gulcehre, Ziyu Wang, Tobias Pfaff, Yuhuai Wu, Roman Ring, Dani Yogatama, Dario Wnsch, Katrina McKinney, Oliver Smith, Tom Schaul, Timothy Lillicrap, Koray Kavukcuoglu, Demis Hassabis, Chris Apps\*, David Silver\*.

In *Nature*, 2019.

### **Discovery of Useful Questions as Auxiliary Tasks**

Vivek Veeriah, Matteo Hessel, Zhongwen Xu, Richard Lewis, Janarthanan Rajendran, **Junhyuk Oh**, Hado van Hasselt, David Silver, Satinder Singh.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2019.

### **Unicorn: Continual Learning with a Universal, Off-policy Agent**

Daniel J. Mankowitz, Augustin deq, Andr Barreto, Dan Horgan, Matteo Hessel, John Quan, **Junhyuk Oh**, Hado van Hasselt, David Silver, Tom Schaul.

In *Reinforcement Learning and Decision Making (RLDM)*, 2019.

### **Contingency-Aware Exploration in Reinforcement Learning**

Jongwook Choi\*, Yijie Guo\*, Marcin Moczulski\*, **Junhyuk Oh**, Neal Wu, Mohammad Norouzi, Honglak Lee.

In *International Conference on Learning Representations (ICLR)*, 2019.

### **On Learning Intrinsic Rewards for Policy Gradient Methods**

Zeyu Zheng, **Junhyuk Oh**, Satinder Singh.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.

### **Hierarchical Reinforcement Learning for Zero-shot Generalization with Subtask Dependencies**

Sungryull Sohn, **Junhyuk Oh**, Honglak Lee.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.

### **Self-Imitation Learning**

**Junhyuk Oh\***, Yijie Guo\*, Satinder Singh, Honglak Lee.

In *Proceedings of the 35th International Conference on Machine Learning (ICML)*, 2018.

### **Value Prediction Network**

**Junhyuk Oh**, Satinder Singh, Honglak Lee.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2017.

### **Zero-Shot Task Generalization with Multi-Task Deep Reinforcement Learning**

**Junhyuk Oh**, Satinder Singh, Honglak Lee, Pushmeet Kohli.

In *Proceedings of the 34th International Conference on Machine Learning (ICML)*, 2017.

## **Control of Memory, Active Perception, and Action in Minecraft**

**Junhyuk Oh**, Valliappa Chockalingam, Satinder Singh, Honglak Lee.

In *Proceedings of the 33rd International Conference on Machine Learning (ICML)*, 2016.

**Press:** MIT Technology Review and Daily Mail

## **Learning Transferrable Knowledge for Semantic Segmentation with Deep Convolutional Neural Network**

Seunghoon Hong, **Junhyuk Oh**, Bohyung Han, Honglak Lee.

In *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016. **Spotlight**

## **Action-Conditional Video Prediction using Deep Networks in Atari Games**

**Junhyuk Oh**, Xiaoxiao Guo, Honglak Lee, Richard Lewis, Satinder Singh.

In *Advances in Neural Information Processing Systems (NeurIPS)*, 2015. **Spotlight**

## **INVITED TALKS**

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RE·WORK Deep Reinforcement Learning Summit at San Francisco	<i>June 2019</i>
ICML 2018 Workshop on Prediction and Generative Modeling in RL	<i>July 2018</i>
RE·WORK Deep Learning Summit at San Francisco	<i>Jan 2018</i>
Ann Arbor Deep Learning Event	<i>Nov 2017</i>
Amazon Graduate Research Symposium	<i>Oct 2017</i>
RE·WORK Machine Intelligence Summit at San Francisco	<i>Mar 2017</i>
NIPS 2016 Deep Reinforcement Learning Workshop	<i>Dec 2016</i>
Ann Arbor Deep Learning Event	<i>Nov 2016</i>

## **TEACHING EXPERIENCE**

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<b>Guest Lecturer</b> , EECS 545 Machine Learning (Prof. Jacob Abernethy)	<i>Apr 2016</i>
Two lectures on Neural Networks and Deep Learning at University of Michigan.	

## **PROFESSIONAL ACTIVITIES**

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- **Workshop/Symposium Organizer**
  - ICLR 2019 Workshop on Structure and Priors in Reinforcement Learning
  - ICML 2018 Workshop on Exploration in Reinforcement Learning
  - NeurIPS 2017 Symposium on Deep Reinforcement Learning
- **Conference Area Chair**
  - Advances in Neural Information Processing Systems (NeurIPS): 2021
- **Conference/Journal Reviewer**
  - Advances in Neural Information Processing Systems (NeurIPS): 2017-2020
  - International Conference on Machine Learning (ICML): 2017-
  - International Conference on Learning Representation (ICLR): 2017-
  - AAAI Conference on Artificial Intelligence (AAAI): 2019-2020
  - International Conference on Robotics and Automation (ICRA): 2018
  - Conference on Uncertainty in Artificial Intelligence (UAI): 2018
  - Journal of Machine Learning Research: 2019
  - Neural Networks: 2017
  - International Journal of Computer Vision (IJCV): 2018

## AWARDS AND HONORS

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CSE Honors Competition Finalist	<i>2017</i>
Graduate Scholarship from Kwanjeong Educational Foundation	<i>2014 - 2018</i>
Undergraduate Scholarship from Korea Student Aid Foundation	<i>2007 - 2014</i>