

Hany Hamed

Currently, working on zero-shot generalization in RL

Interested in Reinforcement Learning, Multi-Agent System, & Robotics.

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EDUCATION

Korea Advanced Institute of Science & Technology (KAIST)

Daejeon, South Korea

Master of Science in Computer Science

Aug 2022 – June 2024

- KAIST's full scholarship
- Member of [Machine Learning and Mind Lab \(MLML\)](#)
- **Supervisor:** Prof. [Sungjin Ahn](#)
- **CGPA:** 4.00/4.30 ([Latest transcript](#))

Innopolis University

Innopolis, Russia

Bachelor of Computer Science (Robotics track)

Aug 2018 – June 2022

- Innopolis University's full scholarship
- Outstanding Achievements at Innopolis University for Fall 2020 ([Diploma](#))
- Outstanding Contribution to Science at Innopolis University during 2020/2021 ([Certificate](#)) and 2021/2022 ([Certificate](#))
- **CGPA:** 4.68/5.00 ([Diploma](#))

RESEARCH EXPERIENCE

Graduate Student Researcher

Nov 2022 – Present

KAIST

Daejeon, South Korea

- Working as a researcher as a part of my Master's degree under the supervision of Prof. Sungjin Ahn (Machine Learning and Mind Lab (MLML))
- Working on zero-shot generalization in Reinforcement Learning

Bachelor Thesis

April 2021 – June 2022

- "Learning behavioural strategies for multi-robot system in a predator-prey environment using Reinforcement Learning"
- **Keywords:** reinforcement learning, predator-prey, self-play, multi-agent
- **Links:** [Preprint](#), [GitHub repository](#) & [presentation](#)
- **Supervised by:** Prof. [Alexandr Klimchik](#) & Prof. [Stefano Nolfi](#)

Laboratory Assistant

June 2021 – June 2022

Unmanned Technology Laboratory, Innopolis University

Innopolis, Russia

- Integrating and developing ROS packages of different modules for drones (Gimbal control, RTK GPS, ...etc)
- Integrated Livox lidar with a drone for outdoor mapping
- Developed a handheld Lidar device for indoor/outdoor mapping for an industrial partner ([results](#))
- Developed remote control for drone's payload through ROS and QGS
- Integrate LIO-SAM with lab's self-driving car

Undergraduate Research Assistant

Aug 2019 – April 2021

Center for Technologies in Robotics and Mechatronics Components, Innopolis University

Innopolis, Russia

- Implemented a gym environment for a Tensegrity hopper
- Developed experiments using ARS RL algorithm to learn a stabilizing control policy for a tensegrity hopper
- Designed and implemented a contactless differentiable physics simulator for tensegrity robots using Taichi
- Performed research on sim2real transfer for a three-prism tensegrity robot

PUBLICATIONS & IN PROGRESS MANUSCRIPTS

- G. Kulathunga, H. Hamed, D. Devitt, and A. Klimchik, “Optimization-based trajectory tracking approach for multi-rotor aerial vehicles in unknown environments,” *IEEE Robotics and Automation Letters*, 2022 ([IEEE paper](#), [arXiv](#))
Contributions: debugging, conducting, and piloting real-world experiments
- V. Kurenkov, H. Hamed, and S. Savin, “Learning stabilizing control policies for a tensegrity hopper with augmented random search,” in *2020 International Conference on Industrial Engineering, Applications and Manufacturing (ICIEAM)*, pp. 1–5, IEEE, 2020 ([code](#), [paper](#))
Contributions: developing the simulation environment and the RL experiments
- L. Vorochaeva, S. Savin, and H. Hamed, “Lateral gait analysis of a crawling robot by means of controlling the lengths of links and friction in the supports,” in *2020 International Conference Nonlinearity, Information and Robotics (NIR)*, pp. 1–6, IEEE, 2020 ([paper](#))
Contributions: proofreading, literature review & related-work, and section writing

TEACHING EXPERIENCE

Teacher Assistant (TA)

Feb 2023 – June 2023

KAIST

Daejeon, South Korea

- TA for CS 492: Special Topics in Computer Science Deep Reinforcement Learning. Main Instructor: Prof. Sungjin Ahn
(Undergraduate and M.S. graduate level course) (Class size: 50 students)
- Preparing programming and theoretical assignments and in-class quizzes (shared with other TAs)
- Correcting students’ assignments submissions
- Conducting office hours to answer students questions and inquiries

Teacher Assistant (TA)

May 2022 – July 2022

Innopolis University

Innopolis, Russia

- Assisting in developing and teaching the “Introduction to ROS” summer course with the main instructor Geesara Prathap for first-year university students as a third semester (Class size: 15 students)
- Conducting and teaching practical labs for the students
- Developing, preparing, and grading assignments

SELECTED AWARDS & CERTIFICATES & SUMMER SCHOOLS

Online Asian Machine Learning School ([OAMLS 2021](#), [certificate](#))

November 2021

- This school covered multiple topics in Machine learning: computer vision, deep learning, NLP, representation learning, transfer learning, reinforcement learning, causality and meta learning.

European Agent Systems Summer School ([EASSS 2021](#))

July 2021

- The summer school explored different topics related to multi-agent systems around cooperative systems, reinforcement learning, game theory, modeling and simulation.

3rd place DOTS competition from Bristol Robotics Lab and Toshiba ([Certificate](#))

June 2021

- The competition was about developing an algorithm for multi robots to collect food items and return it to the storage in a gazebo simulated environment.

Winter School on Machine Learning in Robotics ([Certificate of Participation](#))

Dec 2020

- This school explored the intersection of machine learning in robotics in areas of reinforcement learning, and computer vision

SKILLS & TOOLS

- PyTorch, Tensorflow, ROS, Python, C/C++, Docker, Git, Linux

WORKING EXPERIENCE

Technical Intern

July 2019 – Aug 2019 - [\[Doc\]](#)

Copter Express

Moscow, Russia

- Had a training about main components and construction of drones
- Had a training on programming COEX's drones (ROS, px4 and indoor navigation using Aruco markers)
- Developed a human pose estimation with a webcam using Tensorflow.js to control a drone
- Integrated RTAP-Map SLAM algorithm with COEX's drone using Intel Real-Sense T265 and D435 cameras

PROJECTS

Drone Detection (Computer Vision project course) | [Link](#) | *PyTorch*

September 2021

- Collected and labeled a diverse dataset
- Implemented training scripts for Faster R-CNN pretrained models from detectron2

Human Pose Estimation Drone Control | [Link](#) | *Python, TF.js, ROS*

July 2019

- Explored and tested different human pose estimation modules
- Integrated a drone controller with human pose estimation module built with TensorFlow.js

EXTRACURRICULAR ACTIVITIES

Judge at Korea Science and Engineering Fair (KSEF) International | [Certificate](#)

2022

- Judged in the category of Computer Science
- Conducted technical interviews with the participants
- Judged the research reports and presentations made by the participants

Judge at WRO International Finals [Advanced Robotics Challenge - ARC] | [Certificate](#)

2019

- Developed the game rules for the international competition
- Judged the Russian qualifications as the Head judge and the International competition as a judge
- Collaborated in the development of a playground generator for the competition using C++ and Javascript

Participant in RoboCup Junior Egypt Open Weight Soccer Category (2nd place)

2018

- Developed ball detection using OpenCV and the robot's game controller algorithm
- Developed PCB boards for the robot