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Highlights

- Reimplementation of 14 famous Deep Reinforcement Learning papers.
- 3rd place in The RoboCup Iran Open 2018 International Competitions.
- 2 years of teamwork experience as a researcher in the KN2C robotics lab.
- Interdisciplinary knowledge in Reinforcement Learning, Deep Learning, Computer Vision and Robotics.

Research Interest

- Machine Learning (Especially: Reinforcement learning and Deep Learning.)
- Computer Vision and Image Processing.
- Robotics.
- Control theory.

Education

K.N. Toosi University of Technology B.Sc in Electrical Engineering	2015-2020
• Cumulative GPA: 3.2/4 (16.09/20) -via 143 Credits.	
Razi High school High School Diplomas in Physics and Mathematics.	2011-2015
• Total GPA: 3.89/4 (19.49/20).	

Honors and Awards

- **3rd place** of The RoboCup Iran Open Competitions in Unmanned Aerial Vehicle League. [[link](#)] 2018
- **6th place** of The RoboCup Asia-Pacific Competitions in Unmanned Aerial Vehicle League. [[link](#)] 2018
- Ranked **within top 0.7 percent** in Iran's National University Exam among nearly 252,000 participants. 2015

Certificates

- **Fundamentals of Reinforcement Learning** - University of Alberta on Coursera [[link](#)] 2020
- **Neural Networks and Deep Learning** - DeepLearning.AI on Coursera [[link](#)] 2020
- **Divide & Conquer, Sorting & Searching, and Randomized Algorithms** - Stanford on Coursera [[link](#)] 2021

Experience

Research Assistant Researcher at KN2C Robotics Lab, Supervisor: Dr. Hamid D. Taghirad	2017-2019
• Member of Computer Vision and A.I group of Micro Aerial Vehicle section.	
Teaching Assistant Signals and Systems, Instructor: Dr. Maryam mohebbi	Fall 2019
Teaching Assistant Fundamentals of Computer Vision, Instructor: Dr. Behrooz Nasihatkon	Winter 2020
Co-Instructor KN2C's course "Fundamentals of Artificial Intelligence", Instructor: Armin sadreddin (KN2C ex-Leader)	Spring 2020

Research Experience

Rainbow

2020

Combining Improvements in Deep Reinforcement Learning.

- Implementation of the DeepMind's paper [Rainbow](#) on Pong. [[Project page](#)]

Exploration by Random Network Distillation

2020

Exploration based on the agent's Intrinsic rewards that are proportional to the novelty it faces.

- Implementation of the OpenAI's paper [Exploration by RND](#) on Montezuma's Revenge. [[Project page](#)]

Proximal Policy Optimization Algorithms

2020

Policy gradient methods that alternate between sampling data and optimizing a "surrogate" objective function.

- Implementation of the OpenAI's paper [PPO](#) on Breakout, Ant and Mario. [[Atari Page](#)] [[MuJoCo Page](#)] [[Mario Page](#)]

B.Sc. Final Project: Soft Actor-Critic

2020

Off-Policy Maximum Entropy Deep Reinforcement Learning with a Stochastic Actor.

- Implementation of the Berkeley's paper [SAC](#) on Humanoid. [[Project Page](#)]

Discrete Soft Actor-Critic

2020

Soft Actor-Critic For Discrete Action Settings.

- Implementation of the ICL's paper [Discrete-SAC](#) on Pacman. [[Project Page](#)]

Deep deterministic Policy Gradient and Hindsight Experience Replay

2020

Using DDPG to control continuously and HER to solve sparse-reward environments problem.

- Implementation of the DeepMind's paper [DDPG](#) and OpenAI's paper [HER](#) on FetchPickAndPlace. [[Project Page](#)]

Twin Delayed Deep Deterministic Policy Gradient

2020

Addressing Function Approximation Error in Actor-Critic Methods.

- Implementation of the McGill's paper [TD3](#) on Hopper and Ant. [[Project page](#)]

Tabular Reinforcement Learning

2020

Implementing fundamental Reinforcement Learning algorithms in tabular format on Taxi gym environment.

- Off-Policy Temporal Difference Learning (Q-Learning). [[Project Page](#)]
- State-action-reward-state-action (SARSA). [[Project Page](#)]
- Backward View of TD(λ) both by Q-Learning and SARSA. [[Q\(\$\lambda\$ \) Project Page](#)] [[SARSA\(\$\lambda\$ \) Project Page](#)]
- Combination of Q-learning and Q-planning (Dyna-Q). [[Project Page](#)]

Cycle GAN

2020

Unpaired Image-to-Image Translation using Cycle-Consistent Adversarial Networks.

- Implementation of the BAIR's paper [Cycle GAN](#) on Horse2Zebra dataset. [[Project Page](#)]

Persian Digits Classification

2020

Designing and preparing instructions of [13th lab](#) of Fundamentals of Computer Vision course

- Using Linear and RBF SVMs, KNN and Random Forest methods to classify images of handwritten Persian digits.

Auxiliary and Deep Convolutional GANs

2019

Using DCGAN to generate real-like images and Auxiliary GAN to improve quality.

- Implementation of the indico Research's paper [DCGAN](#) and Google Brain's paper [AUXGAN](#) on MNIST. [[Project Page](#)]

Deep Dream and Style Transfer

2019

Using Deep Dream to visualize a model's layer output and Style Transfer to transfer the style of an image to another.

- Implementation of Deep Dream using Inception-V3 and Style Transfer using VGG19. [[Project Page](#)]

UAV Geo-Localization

2019

Using convolutional neural networks to estimate GPS coordinates.

- Using features of ResNet50 to match current downward view of an UAV with a known provided map.

Face Detection and Facial Expression Classification

2019

[Final project](#) of Fundamentals of Computer Vision course.

- Using Cascade Detectors with LBP features to detect the face and CNN to classify the expression of it.

Fast Fourier Transform on FPGA

2019

Final project of Design of Digital System course.

- Implementation of the 64 point FFT on FPGA using VHDL.

Line Detection and Following

2018

Task in KN2C robotics lab.

- Using pure Computer Vision techniques like Contour Approximation Method, Image Filtering and Histograms on the embedded system (Odroid-XU4) of a drone to detect a colorful line in the downward view navigating to follow a specific path autonomously.

Pole Collision Avoidance

2018

Task in KN2C robotics lab.

- Using pure Computer Vision techniques **without any external aid of Depth Cameras or Laser Scanners** to navigate a drone autonomously through some obstacles (poles) without any collisions.

Technical Skills

Programming Languages	Experienced: Python C/C++ Bash VHDL	Familiar: Java Assembly
Libraries	PyTorch TensorFlow Keras Scikit-learn Numpy Gym OpenCV Matplotlib	
Frameworks	Qt ROS	
Version Control System	Git	
Operating systems	Linux (Ubuntu) Microsoft Windows	
Engineering software	MATLAB and Simulink Keil µVision Altium designer CodeVision AVR ISE - Xilinx	
Embedded systems	Upboard Odroid-XU4 Raspberry Pi	
Microcontrollers	Atmel AVR Atmega and AtXmega series ARM Cortex-M series (STM32)	
General software	Microsoft Office Adobe Photoshop	

Language Proficiency

Farsi: Native

English:

TOEFL (internet-based) score: 104

- Reading: 24 | Listening: 29 | Speaking: 25 | Writing: 26

GRE (General)

- Analytical writing assessment: 3.5 (38th Percentile)
- Verbal Reasoning: 154 (63rd Percentile)
- Quantitative Reasoning: 160 (72nd Percentile)

Interests

- Mountain hiking, Swimming, Playing Ping-Pong.
- Listening to Music, Going to Theater, and discussion with peers.

References

Prof. Hamid D. Taghirad

Professor at Faculty of Electrical Engineering and Vice-Chancellor for International Affairs, K. N. Toosi University of Technology

- Email: taghirad@kntu.ac.ir, [Homepage](#)

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