

Arman Akbari

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Research Interests

- Computer Vision
- Machine learning
- Trustworthy machine learning
- Reinforcement Learning

Education

University of Tehran (Received Full Scholarship) Sep. 2020 – Present
Bachelor of Science in Computer Science - GPA: 3.94/4 (19.02/20) FIRST RANK Tehran, Iran

National Organization for Development of Exceptional Talents(SAMPAD) Sep. 2007 – Sep. 2020
Diploma in Mathematics - GPA: 19.5/20 Tehran, Iran

Publications

A 2D Geometry Based Grasping Pose Generation Algorithm for a Two-finger Robot Hand

Accepted in ICCEconf and will be published soon

- In this paper, a geometry-based algorithm is presented which can find grasp poses based on the geometry of the unknown object and propose the ones which may lead to successful grasping. Simulation results demonstrate that the proposed algorithm for unknown object grasping can find a finite number of successful grasp poses for different seen or unseen objects without using any random point

Research Experience

Research Assistant, Singapore University of Technology and Design (SUTD) Jan. 2023 , May, 2023
Supervisor: Prof. Ngai-Man (Man) Cheung

- Execute the intricate task of implementing Diffusion Models, with a special focus on the application of Denoising Diffusion Probabilistic Models (DDPMs). Undertake the challenging endeavor of training these DDPMs utilizing a constrained dataset

Research Assistant, TaarLab: Human and Robot Interaction Laboratory Jun, 2022 - Apr, 2023
Supervisor: Dr. Tale Masouleh

- A 2D Geometry Based Grasping Pose Generation Algorithm
- A method for removing ungraspable pair points before testing them
- Implementing deep reinforcement learning algorithms that use our grasping pose generation the algorithm as input data

Related Courses

- Artificial Intelligence [4/4]
- Deep Learning (Topics in CS 1) [4/4]
- Fundamentals of CS and Programming [4/4]
- Data Mining [4/4]
- Bio-Computing [4/4]
- Linear Algebra [4/4]
- Design and Analysis of Algorithms [4/4]
- Data Structures and Algorithms [4/4]
- Advanced Programming [4/4]
- Probability 1 [4/4]
- Stanford CS229(Machine Learning) [Audit]
- Stanford CS231n(Computer Vision) [Audit]

Teaching Experience

Data Mining

Teaching Assistant for Dr. Sajedi, University of Tehran

- Responsibilities: Designing assignments and the final project (Spring 2023)

Fundamentals of Computer Science and Programming

Teaching Assistant for Dr. Nowzari, University of Tehran

- Responsibilities: Held tutorials on Object Oriented Programming (Fall 2022)

Fundamentals of Computer Science and Programming

Teaching Assistant for Dr. Mousavian, University of Tehran

- Responsibilities: Held tutorials on basic Python programming concepts (winter 2022)

Differential Equations

Teaching Assistant for Dr. Rokni, University of Tehran

- Responsibilities: Designing assignments and grading them (Spring 2022)

Honors And Awards

Awarded Best technical team in Robocup Asia Pacific.

2018

Tasked to detect the ball in the field with OpenCV(image processing)

Robocup Iran Open International Competitions Participation.

2018

Tasked to design algorithms and program the robot with c++

Received Full Scholarship from the University of Tehran

2020

Accepted in this program (Konkour) with nearly 0.02/100 acceptance rate

Ranked 355 in Iran's National University Entrance Exam(over 250,000 Participants)

2020

Ranked 355 out of 250000 students in national university entrance exam, Mathematical studies

Member of National Organization for Development of Exceptional Talents.

2007 - 2020

The organization is aimed to provide a unique educational environment for the exceptionally talented students

Projects Experience

DDPMs

Mar, 2023

Internship at SUTD in Singapore

- Diffusion models are a type of generative model used in machine learning and statistics. This is a basic implementation of Denoising Diffusion Probabilistic Models

Grapevine Leaves Image Classification

Jul, 2022

Data Mining project [done Individually and received full mark]

- Comparing different pretrained CNN models
- Designed an auto encoder for denoising

Transfer Learning (Artificial Neural Networks, Computer vision)

Nov, 2022

Voluntarity Project

- comparing different transfer learning models to custom CNN on CIFAR-10 dataset

8-Puzzle

Apr, 2023

Assignments of Artificial Intelligence course

- Solving the 8-puzzle game with search algorithms such as A*, UCS, IDS, BFS and DFS

Bio-Computing

Apr, 2023

Assignments of Bio-Computing course

- Implementing many bio-computing algorithms such as genetic algorithm, PSO, and Ant Colony with Python and solving combinatorial problems such as N-Queen, TSP, and etc. with them.

Four Connect

Nov, 2022

Assignments of Artificial Intelligence course

- I used AI algorithms such Minmax and Monte Carlo Search Tree to build an agent in order to play Four Connect game

Mini Database System using B-Tree (C++)

Feb, 2022

Data structures and algorithms final project

- Implementation of a simplistic relational database purely in C++

Control Panel (Django)

Feb, 2021

Final project of Basic programming course

- high level panel for uploading and grading assignments with different privileges

Corridor Game (C++)

Jul, 2021

Final Project of Advanced Programming course

- server-client based game which can handle up to 4 players

Presentations

Introduction to Adversarial Machine learning

Apr, 2023

Bio-Computing TA class

- A brief introduction to adversarial machine learning and its attacks and defences

An overview of Ant-Q algorithm

May, 2023

Bio-Computing class presentation

- Presented Ant-Q algorithm and Q-learning, Bellman optimality, off-policy learning

Course Certification

Machine Learning — Credential ID EJUEQN5ABDFD

Nov. 2021

This course provides a broad introduction to machine learning, datamining, and statistical pattern recognition.

- Topics include: Supervised learning (SVM, kernels, neural networks), Unsupervised learning (clustering, dimensionality reduction, recommender systems, deep learning)

Deep Learning Specialization — Credential ID WYBXMV4D8XRF

Nov. 2021

This Specialization consists of 5 coursera:

- Neural Networks and Deep Learning
- Structuring Machine Learning Projects
- Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
- Convolutional Neural Networks
- Sequence Models: build and train RNNs, work with NLP and Words Embeddings

Skills

Programming Languages: Python, C/C++

Frameworks/Libraries: Pytorch, Tensorflow, Keras, Scikit-learn, openCV, Pandas, Numpy, Matplotlib, Seaborn, Django

Soft Skills: Teamwork, Problem Solving, Work Ethic, Adaptability, Critical Thinking

Others: \LaTeX , Violin(+6 years of experience), Music Theory, Git, Linux

Languages

Persian: Native **English:** Proficient