Taraneh Ghandi

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Education

McMaster University | *Hamilton, ON, Canada*
PhD in Computational Science and Engineering | September. 2023 - Ongoing
Supervisor: Dr. Hamidreza Mahyar

Ferdowsi University of Mashhad (FUM) | *Mashhad, Iran*
M.Eng. in Computer Engineering | October. 2020 - February 2023
Supervisor: Dr. Hamidreza Pourreza
GPA (current): 19.24/20 (4/4). Ranked 1st among all students, class of 2022

Ferdowsi University of Mashhad (FUM) | *Mashhad, Iran*
B.Eng. in Computer Engineering | September. 2016 - October. 2020
GPA: 18.54/20 (3.77/4). Ranked 5th among all (120) students, class of 2020

Technical Skills

Programming	Python, C, C++, C#, Java, MATLAB, QT & QML, Javascript, PHP, HTML5, CSS, MySQL, Laravel, Bootstrap, Android Programming, Cross-Platform Programming, Game Design and Development, Basic knowledge of Prolog **Also:** Linux and Git
Professional Softwares	Unity, QT Creator, Android Studio, Adobe Premiere Pro, KDenLive
Graphics, Digital Art, & Typesetting	*3D Modeling and Rendering:* Blender, Rhino3D, KeyShot, Basic knowledge of ZBrush, Autodesk 3Ds Max and RealFlow *Digital Painting:* Krita, Clip Studio Paint, Corel Graphics Suite *Typesetting:* LaTeX, Office
Languages	English (Professional working proficiency) Persian (Native)

Publications

[1] **Taraneh Ghandi**, Hamidreza Pourreza, Hamidreza Mahyar. "Deep Learning Approaches on Image Captioning: A Review" ,38 pages, *ACM Computing Surveys, 2023, DOI: 10.1145/3617592*, [Link]

[2] Kamaledin Ghiasi-Shirazi, **Taraneh Ghandi**, Ali Taghizadeh, et al. "Revisiting 2-3 Red-Black Trees with a Pedagogically Sound yet Efficient Deletion Algorithm: The Parity-Seeking Delete Algorithm" , 17 pages, *Acta Informatica (June 2022, Under review)*. [Link]

Notable Projects

Image Captioning as a Core Feature for a Vision Assistant

M.Eng. project, under the supervision of Dr. Hamidreza Pourreza and Dr. Hamidreza Mahyar | March 2022 - ongoing

- Hierarchical caption generation using scene graphs, GCNs and Transformers
- Captions must be detailed to suit the needs of visually impaired individuals.

Stereo Reconstruction

Course project for the "Probabilistic Graphical Models" course. | February 2022

Used the following algorithms to compute depth maps:

- Block-matching
- Graph-cut (α-expansion and α-β swap)
- Kolmogorov and Zabih's
- Loopy Belief Propagation

Multi-Object Motion Detection and Prediction

Course project for the "Probabilistic Graphical Models" course.   February 2022

Used the following methods for motion detection and prediction:

- Kalman filter
- Particle filter

Detecting Grasp Type for Robotic Hand Using Deep Learning and Machine Vision

B.Eng. final project, under the supervision of Dr. Hamidreza Pourreza and Dr. Alireza Akbarzadeh Tootoonchi   September 2019- October 2020

- Trained YOLOv3 on a custom dataset containing 13,144 objects for grasp type detection.
- The custom dataset was obtained from Open Images V6 and manually labeled.

ShoweringAI

(Personal Project) Text generation using GPT-2.   Winter 2020

- A bot capable of generating short epiphanies that highlight the oddities within the familiar, in form of text.
- Top posts from the "r/ShowerThoughts" sub-reddit are scraped and used as training data for GPT-2.

The *MelBeatSo* Smart Music Recommendation System

Personal project topic proposed and executed as course project for the Multimedia Systems course   Winter 2020 - Summer 2020

- *MelBeatSo* recommends new musical pieces using multimedia factors such as: tempo, mood, and keywords (in song title or lyrics).
- Word2Vec models are used to search semantically similar keywords in song lyrics.
- Facial Emotion Recognition applied on album art is used as a deciding factor to determine a song's mood.

The *MelBeatSo* Dataset: Creation, Data Mining and Clustering

Personal project topic proposed and executed as course project for the Data Mining course   Fall 2019 - Winter 2020

- The *MelBeatSo* dataset is a collection of 37 musical features computed for 4,828 musical pieces.
- The pieces are scraped from a popular online music platform called *RadioJavan*.

Real-time Controller based on EtherCAT for the *Delta Robot*, using QT framework (in Linux)

Internship project, under the supervision of Dr. Alireza Akbarzadeh Tootoonchi   Summer 2019

- The *Delta Robot* is a parallel robot with three parallelogram arms, typically used in pick-and-place tasks in the industry.
- *Delta*'s signature features are its high acceleration and speed.
- The real-time controller is a GUI application created using the QT framework.
- Since the *Delta* robot needs to execute commands real-time, it was necessary to build the controller in Linux.

RetroShooter

Course project for the "Game Design" course. A Puzzle-Action game.   Summer 2019

- A hardcore puzzle game built using the Unity game engine.
- The game is designed to have an emergent core, with aesthetic visuals.

GEMINI

Course project for the "Database Design" course. A social media platform.   Winter 2018

- Users can create, like and comment on posts.
- Users can follow, un-follow, or block each other.
- There are three types of users: regular, manager, and analyzer.
- The application has a feed page, a search page and a trending page.

TwoStack

(Personal Project)   Spring 2018 - Summer 2018

- Game-based learning software designed as an assignment for the undergraduate students taking the Data Structures course.
- The application is designed using the QT framework, Javascript and the QML language.
- Developed for Windows, Linux and Android.

RoboMom

Course project for the "Computer Lab: Introduction to Computer Engineering" course.   Fall 2016 - Winter 2017

- Remotely-controlled baby monitor robot.
- The robot is remotely controlled via a controller application sending commands over Bluetooth.
- The controller is an Android application, capable of commanding the robot to move in the desired direction.

Awards and Honors ───

September 2021	Selected as a Talented Student by Ferdowsi University of Mashhad to pursue M.Eng. without an entrance exam
October 2020	Selected as the Top Intern of the Computer Engineering Department at Ferdowsi University of Mashhad

Experiences

Teaching Assistant (Team Leader): Python Course

Computer Engineering Department   Fall 2019, Winter and Spring 2020

Teaching Assistant: Compiler Design

Dr. Haleh Amintoosi   Fall 2019

Internship

FUM Robotics Lab, Supervisors: Dr. Alireza Akbarzadeh Tootoonchi, Dr. Ahad Harati   Summer 2019

Teaching Assistant: Data Structures

Dr. Kamaledin Ghiasi-Shirazi   Winter, Spring and Fall 2018,
                                                                        Fall 2019, Winter and Spring 2020

Teaching Assistant: Discrete Mathematics

Dr. Abbas Ghaemi Bafghi   Winter 2018

Teaching Assistant: Discrete Mathematics

Dr. Kamaledin Ghiasi-Shirazi   Winter 2018

Volunteer Services

The International Conference on Computer and Knowledge Engineering (ICCKE)   *Website*

Peer Reviewer   August 2022

Entropy   *Website*

Peer Reviewer   August 2022

Artificial Intelligence Review   *Website*

Peer Reviewer   July 2022

Hobbies

Playing the Violin

Classical Persian Music

Traditional Painting

Mediums: Acrylic, Gouache, Poster Color

3D Modeling and Rendering

Favorite modeling software: Rhino3D, Blender, ZBrush and RealFlow
Favorite rendering engines: Keyshot, Blender

Digital Painting

Favorite painting software: Krita, Clip Studio Paint, Paint Tool SAI

References

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- **Dr. Kamaledin Ghiasi-Shirazi**
  Ph. D, Assistant Professor, Department of Computer Engineering, Ferdowsi University of Mashhad, Mashhad, Iran
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- **Dr. Hamidreza Mahyar**
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- **Prof. Alireza Akbarzadeh Tootoonchi**
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