

# Korosh Roohi

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## RESEARCH INTERESTS

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- Computer Vision
- Image-to-image translation
- Gait Analysis
- Generative Models
- Pose Estimation
- Medical image processing

## EDUCATION

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- **Amirkabir University of Technology**, (Tehran Polytechnic) Tehran, Iran  
*B.Sc. in Computer Engineering* Sep 2018 - Present
  - GPA: 3.82/4  $\approx$  18.19/20
  - Courses: Data Mining (18.9/20), Signals and Systems (19.5/20), Principles of Computational Intelligence (18/20), Computer Networks (19.2/20), Principles of Artificial Intelligence (16.3/20), Software Engineering II (20/20)
- **Alborz High School** Tehran, Iran  
*Mathematics & Physics* Sep 2015 - Jul 2018
  - GPA: 19.5/20

## RESEARCH & WORK EXPERIENCES

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- **Research Assistant at Amirkabir University of Technology** Tehran, Iran  
*Under the supervision of Prof. Safabakhsh* Dec 2021 - Present

Working on a project about the re-identification of persons using each subject's **gait** (unique walking pattern) from their specific **estimated pose**. This project utilizes deep learning approaches like **convolutional**, **pooling**, and **HPM** layers. Also, **triplet loss** is used for training procedures, and **DeepSort** & **YoloV5** models used for tracking and extracting each person in real-world usage.
- **Software Engineer at Crouse Company's Research & Innovation department** Tehran, Iran  
*Computer vision specialist (Part-time)* Apr 2022 - Jul 2022

Implemented a project for **detecting defects** of car's multimedia displays in the production line, which uses **Image processing** methods like **thresholding**, **dilation**, and **erosion** with the help of the **OpenCV** library. Also, it utilizes some **machine learning** approaches like the **Tesseract** engine for **OCR** tasks and the **isolation forest** algorithm to identify outlier pixels on displays.
- **Client Developer at Quiz of Kings Studio** Tehran, Iran  
*Unity game engine developer (Part-time)* Nov 2019 - Nov 2021

Participated in the client-side team of the Quiz of Kings game - the most popular mobile game in Iran - and working with both **Unity** & **Corona** game engines to develop the game on these platforms. The main project was migrating legacy code from the **Corona** game engine to the **Unity** platform.

## PROJECTS

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- **Image colorizer (Computer Vision, GAN)**: Implemented a model with **CycleGAN** & **pix2pix** architectures for translating black & white images into colorized images. This model uses **Cycle** & **Identity** loss functions because it aims to translate a picture's attributes to another domain and keep the main characteristics from the source domain. This model has been trained on the **CelebA** dataset to colorize face parts. This project is available on my **GitHub**.
- **InceptionV3 Transfer Learning (Computer vision, Image recognition)**: Developed a **cat vs. dog** classifier by **fine-tuning** the **InceptionV3** model. This model is trained by freezing the convolutional layers and adding some dense layers to train them on the specific dataset. Also, this model uses the **Dropout** layer to prevent overfitting problems. This project is available on my **GitHub**.
- **Evolutionary Games (Genetic Algorithm, Neural Networks)**: Implemented a **genetic algorithm** project to find an appropriate agent to play specific games. This genetic algorithm consists of the **fitness function**, **selection**, **crossover**, and **mutation** steps. Also, this model uses inputs in a **neural network** structure. The game has three different modes and a unique input structure for each. This project is available on my **GitHub**.
- **MNIST Handwritten Digits Classifier (Neural Networks, Linear Algebra)**: Implemented a **neural network** from scratch without using frameworks like **TensorFlow** and **PyTorch**. This model has flexible layers and neurons on each layer and has the **Momentum** feature to improve the training procedure's speed and accuracy. This project is based on the **MNIST handwritten digits** dataset. This project is available on my **GitHub**.
- **Search Engine (Information Retrieval, Indexing & Tokenizing)**: Developed a search engine for Persian news that uses the **TF-IDF** algorithm for processing user queries and finding the results in the **vector space** by the **Cosine** similarity function. One of the main features is **stemming** verbs as a part of normalization. Also, the indexing and tokenizing section remove frequent terms, punctuations, postfixes, and numbers. This project is available on my **GitHub**.

## SKILLS SUMMARY

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- **Programming Languages:** Python, C#, Java, C/C++, Kotlin, Go
- **Deep Learning Frameworks:** TensorFlow, PyTorch, Keras, scikit-learn, OpenCV, Pandas
- **Database Systems:** MySQL, MongoDB, ObjectBox
- **Operating Systems:** Windows, Linux (Ubuntu)
- **Web Development:** HTML, CSS, Java Script, flask, XML
- **Game Development:** Unity game engine, Corona game engine

## TEACHING EXPERIENCES

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- **Programming Languages** **Prof. Fallah**  
*Designing and grading assignments & projects 0* *Fall 2022*
- **Teaching Assistant, Principles & Applications of Artificial Intelligence** **Prof. Javanmardi**  
*Team coordinating + Holding classes + Designing and grading assignments & projects* *Spring 2022, Fall 2022*
- **Teaching Assistant, Algorithm Design** **Prof. Bagheri**  
*Designing and grading assignments* *Fall 2021*
- **Teaching Assistant, Advanced Programming** **Prof. Zeinali**  
*Holding classes + Head of content team* *Spring 2021*
- **Teaching Assistant, Fundamentals of Computer Programming Lab.** **Prof. Bakhshi**  
*Revising laboratory's syllabus & content* *Winter 2021*
- **Teaching Assistant, Fundamentals of Computer Programming** **Prof. Bakhshi**  
*Designing assignments* *Fall 2020*

## ONLINE COURSES

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- **TensorFlow: Advanced Techniques specialization from DeepLearning.AI** **Certificate**  
*The lecturer of this course was Laurence Moroney* *Nov 2021*  
This specialization had courses about custom and exotic models & custom training loops, model interpretability, generative machine learning, and object detection.
- **TensorFlow Developer specialization from DeepLearning.AI** **Certificate**  
*The lecturer of this course was Laurence Moroney* *Aug 2021*  
This specialization had courses about computer vision, convolutional neural network, machine learning, and natural language processing.
- **CS50 (Computer Science course of Harvard University)** **Certificate**  
*The lecturer of this course was David J. Malan.* *Jan 2022*

## VOLUNTEER EXPERIENCES

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- **Unity game engine instructor at Gamecraft Event**  
*Participated as an instructor in the Unity game engine development workshop.* *May 2022*
- **Gamecraft event organizer at Amirkabir University of Technology**  
*Organized the first game development event at the Amirkabir University of Technology.* *Dec 2020 - Apr 2021*
- **Member of Student's Guild Council at Computer Engineering Faculty**  
*Cultural responsible of the council.* *Jun 2019 - Jul 2021*
- **Director of Pouyesh Magazine**  
*Directed the primary publication of the computer engineering faculty for six issues.* *Jun 2019 - Jul 2021*

## HONORS AND AWARDS

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- Ranked 193 among 140,000 applicants of the **Nationwide University Entrance Exam** - Jul 2018
- Awarded the **Best Publication** award in the Amirkabir University for Directing the **Pouyesh** magazine - Sep, 2020

## LANGUAGES

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- **English (TOEFL iBT: 108/120):** Professional working proficiency
- **Persian:** Native