

MAHDI BAGHERI



Qom - Iran



+989927202400



mahdid.m.2000@gmail.com



www.linkedin.com/in/mahdi-bagheri/



<https://github.com/mahdidBagheri/>

RESEARCH INTERESTS

- COMPUTER VISION
- DEEP LEARNING
- ROBOTICS
- AR/VR

RESEARCH AND WORK EXPERIENCE

FEB 2022 – NOW (+1.5 year)

Augmented Reality for Neuro Navigation Surgery Using HoloLens 2

ARAssist Startup

A new solution for neuro navigation surgeries makes the surgent able to see through a head-mounted device (HoloLens 2) and watch different modalities inside the patient's head.

- Developed the **registration system** capable of automatically detecting the patient's face and registering the CT-scanned 3D-Recunstructed mesh on it. ([Demo](#))
- Designed an assessment scenario for measuring **registration errors**. ([publication in preparation](#))
- Developed the **tracking system** using QR code detection & localization.
- Designed an assessment scenario for **tracking errors**. ([publication in preparation](#))
- Designed **end-to-end** error assessment system. ([publication in preparation](#))

FEB 2021 – APR 2022 (+1 year)

Cattle Counting – Multi-Object Tracking (MOT)

Freelancer

- Developed a **multi-object tracking system** to count cattle entering/exiting animal husbandry.
- Provided an **interactive web app** using Dash for the user to upload video, draw the border and be able to download results. ([Demo](#))

AUG 2021 – DEC 2021 (5 months)

Artificial Optical Sorter

Agricultural Robotics Lab

- We studied optical sorters as a **machinery solution** for the pistachio industry.
- Implemented an **experimental setup**, using a Raspberry Pi board and camera to capture images from falling off pistachios and send them to a computational server to detect and classify by YOLOV5. Then controlling an Arduino board to activate a DC motor whether to accept or reject the object.
- The project ended up as my **B.Sc. thesis**. ([Demo](#))

JUN 2020 – AUG 2020 (3 months)

Computer Vision Intern: Facial Expression Recognition

Center of Excellence in Design, Robotics, and Automation (CEDRA)

A classification problem used for recognizing expressions of humans in front of a humanoid robot.

- Used VGG16 as the base model and trained it on the prepared dataset to be used for Rasa (a humanoid robot in the social and cognitive Lab)

JUN 2020 – AUG 2020 (3 months)

Foot Scanner

Ace Team

- Gathered a team to take on a project, developing an application used in physiotherapy to process and **analyze foot-scanned images** to help physiotherapists design better insole. ([Demo](#))

AUG 2015 – FEB 2017 (1.5 years)

IYPT

Ghodoosi Highschool

A **research-based** competition among interested high school students in physics. Every year, the IYPT committee announces 17 challenging problems and asks teams to research and investigate them. Students must study the phenomena and related theories and try to present their explanations. ([link](#))

- **Hot Water Fountain (2016)**
- **Invent Yourself – Random Number Generation (2016)**
- **Thick Lens (2015)**
- **Circle of Light (2015)**
- **Magnus Glider (2015)**

EDUCATION

SEP 2018 – SEP 2023

B.Sc. in Mechanical Engineering and Minor in Computer Science

Sharif University of Technology

- GPA: 16.90/20
- B.Sc. thesis: Artificial Optical Sorters (Score 20/20)
- Supervisor: Dr. Aria Alasti

PUBLICATIONS

In-preparation:

- Error Assessment Method for AR Assist Neuro Surgery System
- Assessment Of Point Cloud Registration Errors For Neuro Surgery System Using Hololens 2
- Hololens 2 Research Mode Dataset For Custom Tracking System

HONORS & AWARDS

- **Bronze medalist** in National Physics Olympiadⁱ (2017)
- Ranked **973** among **+300,000** in Iranian University Entrance Exam (2018)
- **Champion** team in IYPTⁱⁱ (2015) and 3rd in PYPTⁱⁱⁱ (2016)
- The **chosen** team at the Khwarizmi^{iv} Award (2016)

SKILLS

- **Programming Languages:** Python / MATLAB / C++ / C / C# / Java / JavaScript
- **Libraries:** OpenCV / Pytorch / Open3D / Numpy / Scikit-Learn
- **Frameworks:** FastApi
- **Platforms:** Docker / Kubernetes
- **Databases:** PostgreSQL
- **Embedded Systems:** HoloLes 2 / RaspberryPi / Arduino
- **Soft Skills:** Teamwork / Creativity / Problem Solving

RELATED COURSES

TAKEN		AUDITED		WATCHED ONLINE	
name	record	name	source	name	source
Computer Vision	19.5/20	AI	Sharif CE Dep.	ML & DL	Coursera.com
Linear Algebra	15/20	DL	Sharif CE Dep.	Image Processing	Faradars.com
Advanced Programming	19.8/20	ML	Sharif EE Dep.	Network Security	OCW.Sharif.edu
Applied Electronics	16.8/20	Image Processing	Sharif CS Dep.	Database	OCW.Sharif.edu
Statistics	16.0/20	Advanced ML (MLOps)	Sharif CE Dep.	Operating Systems	OCW.UM.AC.edu
Data Structures	17.9/20	Networks	Sharif CS Dep.	Embedded Systems & IOT	Sharif CE Dep.
Robotics	16.3/20	Product dev & design	Sharif ME Dep.	Parallel Computing	Sharif EE Dep.
Sensing and Control Systems	17.3/20			Algorithm Design	Tehran EE&CE Dep
Numerical Computation	17.8/20			Computer Architecture	OCW.Sharif.edu
				Medical Image Analysis	Sharif CE Dep

LANGUAGE SKILLS

- **Farsi:** Native
- **Arabic:** Basic
- **English:** Professional (IELTS test booked for September 10th)

REFERENCES

- Dr. [Muhammad Reza Mohammadi](#), professor @ [IUST](#) & CTO @ [ARAssist](#)
- Dr. Motafa Kamali Tabrizi, former lecturer @ [SUT](#), researcher @ Tokyo University
- Dr. Masoud Alipour, Computer Vision Scientist @ [AlpVision](#)
- Dr. Aria Alasti professor @ [SUT](#)
- Dr. [Alireza Taheri](#), professor @ [SUT](#) & supervisor @ [CEDRA](#)

ⁱ National Physics Olympiad is series of exams and educations holding by Young Scholar Club. Solving problems and doing experiments is what to be learned and evaluated. Students may compete in order to be chosen as top 40. For those who be chosen there is a 3 months education with top university professors and special credit for university entrance.

ⁱⁱ Iranian Young Physicists Tournament

ⁱⁱⁱ Persian Young Physicists Tournament

^{iv} Khwarizmi award is one the competitions in novelty and creativity in national level. Students may attend to present their inventions or researches. We have presented the research done later in IYPT 2016 ([Circle of light](#))