|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| EnvelopeMAHDI BAGHERI | | | | | | | |
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|  |  | [www.linkedin.com/in/mahdi-bagheri/](http://www.linkedin.com/in/mahdi-bagheri/) | | |  | <https://github.com/mahdidBagheri/> |  |

# RESEARCH INTERESTS

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

# RESEARCH AND WORK EXPERIENCE

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| --- | --- |
|  | 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](https://drive.google.com/file/d/1UNJWf4gWk9qyFkICpafpNWzqtIFZ-WtM/view?usp=sharing)) * 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](https://drive.google.com/file/d/1zUogAgHIMtXq0mP8sJ-b8Lalo55GLE5j/view?usp=share_link)) |
|  | 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](https://drive.google.com/file/d/1LDeFGO0J-lCPq_s482bPJ8vGyLzR0u_s/view?usp=share_link)) |
|  | 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](https://drive.google.com/file/d/1i74jGUFJHMtBb4seB9B0Att8TymUw6qn/view?usp=sharing)) |
|  | 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](https://www.iypt.org/))   * **Hot Water Fountain (2016)** * **Invent Yourself – Random Number Generation (2016)** * **Thick Lens (2015)** * **Circle of Light (2015)** * **Magnus Glider (2015)** |

# EDUCATION

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| --- |
| 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 Olympiad[[1]](#endnote-1) (2017) | * **Champion** team in IYPT[[2]](#endnote-2) (2015) and 3’rd in PYPT[[3]](#endnote-3) (2016) |
| * Ranked **973** among **+300,000** in Iranian University Entrance Exam (2018) | * The **chosen** team at the Khwarizmi[[4]](#endnote-4) 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](https://www.coursera.org/learn/machine-learning) |
| Linear Algebra | 15/20 | DL | Sharif CE Dep. | Image Processing | [Faradars.com](https://faradars.org/courses/mvrimg9105-image-processing-in-matlab-video-tutorials-pack) |
| Advanced Programming | 19.8/20 | ML | Sharif EE Dep. | Network Security | [OCW.Sharif.edu](https://ocw.sharif.edu/course/id/306) |
| Applied Electronics | 16.8/20 | Image Processing | Sharif CS Dep. | Database | [OCW.Sharif.edu](https://ocw.sharif.edu/course/id/120) |
| Statistics | 16.0/20 | Advanced ML (MLOps) | Sharif CE Dep. | Operating Systems | [OCW.UM.AC.edu](http://ocw.um.ac.ir/streams/course/view/94.html) |
| Data Structures | 17.9/20 | Networks | Sharif CS Dep. | Embedded Systems & IOT | [Sharif CE Dep.](https://www.aparat.com/Amir.Mahdi.Hosseini.Monazzah) |
| 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](https://maktabkhooneh.org/course/189-%D8%B7%D8%B1%D8%A7%D8%AD%DB%8C-%D8%A7%D9%84%DA%AF%D9%88%D8%B1%DB%8C%D8%AA%D9%85-mk189/) |
| Numerical Computation | 17.8/20 |  |  | Computer Architecture | [OCW.Sharif.edu](https://ocw.sharif.edu/course/id/93) |
|  |  |  |  | Medical Image Analysis | [Sharif CE Dep](https://maktabkhooneh.org/course/%D8%A2%D9%85%D9%88%D8%B2%D8%B4-%D8%B1%D8%A7%DB%8C%DA%AF%D8%A7%D9%86-%D8%AA%D8%AD%D9%84%DB%8C%D9%84-%D9%87%D9%88%D8%B4%D9%85%D9%86%D8%AF-%D8%AA%D8%B5%D8%A7%D9%88%DB%8C%D8%B1-%D8%B2%DB%8C%D8%B3%D8%AA-%D9%BE%D8%B2%D8%B4%DA%A9%DB%8C-mk1070/) |

# LANGUAGE SKILLS

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

# REFERENCES

|  |  |  |
| --- | --- | --- |
| [Link](#ar) | Dr. [Muhammad Reza Muhammadi](http://webpages.iust.ac.ir/mrmohammadi/index.html), professor @ [IUST](http://www.iust.ac.ir/) & CTO @ [ARAssist](#ARAssist) |  |
| [Link](#conputervision) | Dr. Motafa Kamali Tabrizi, former lecturer @ [SUT](https://www.sharif.edu/), researcher @ Tokyo University |  |
| [Link](#mot) | Dr. Masoud Alipour, Computer Vision Scientist @ [AlpVision](https://life.alpvision.com/about/) |  |
| [Link](#sorter) | Dr. Aria Alasti professor @ [SUT](https://www.sharif.edu/) |  |
| [Link](#cedra) | Dr. [Alireza Taheri](http://sharif.ir/~artaheri/), professor @ [SUT](https://www.sharif.edu/) & supervisor @ [CEDRA](#cedra) |  |

1. 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. [↑](#endnote-ref-1)
2. Iranian Young Physicists Tournament [↑](#endnote-ref-2)
3. Persian Young Physicists Tournament [↑](#endnote-ref-3)
4. 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)](#_iypt) [↑](#endnote-ref-4)