Ahmad Amirivojdan

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EDUCATION

Doctor of Philosophy (Ph.D.) - Biosystems Engineering Feb 2022 - Dec 2026 (Expected)
University of Tennessee Knoxville Knoxville, TN

- **Coursework**: Deep Learning, Machine Learning, Embedded Systems, Data Mining and Analytic, Statistics for Research
- **Research**: Integrating computer vision, machine learning, and IoT advancements to address various challenges in studying animal behaviour and welfare conditions.
- **GPA**: 3.9/4

Master of Science (M.S.) - Artificial Intelligence Sep 2016 - Jan 2020
Shahr-e Qods Azad University Tehran, Iran

- **Research**: Developed a fast and accurate in-field vision system to detect saffron flowers under diurnal illumination fluctuations using Histogram of Gradients (HOG) features and an SVM classifier. [GitHub]
- **Coursework**: Mobile Robotics, Image Processing, Pattern Recognition, Fuzzy Logic, Swarm Intelligence, Machine Learning
- **GPA**: 18/20

Bachelor of Science (B.S.) - Computer Hardware Engineering Sep 2010 - Jan 2016
Parand Azad University Tehran, Iran

- **Research**: Contributed in development of an autonomous humanoid soccer robot to compete in the RoboCup soccer competitions - Parand Robotics Research Center [GitHub]

EXPERIENCE

UT Smart Agriculture Lab Feb 2022 - Dec 2026 (Expected)
Graduate Research Assistant Tehran, Iran

- Customized the Mask-RCNN instance segmentation model to estimate chickens weight and classify their posture from RGB-D recordings.
- Collected 3D recording using an automated data acquisition system and transferred the recordings to the server.
- Curated a dataset containing 1500 images with labeled instances for segmentation purposes using CVAT annotation software.
- Trained a U-Net semantic segmentation model on the curated dataset to study broiler chickens flock mobility level.
- Designed and developed a low-cost deep learning-based solution for real-time poultry feed intake monitoring using sound technology. The proposed method in this research paved the way for a solution to commercial scale feed intake monitoring by improving the estimation accuracy and reducing the overall cost comparing to the previous works. [GitHub]
- Designed a data acquisition system and collected 19-days consecutive audio recording from a piezoelectric sensor attached to a feeder along with scale data as the ground truth measure. [Dataset]
- Curated a dataset of audio samples with their corresponding event label using Label-Studio annotation tool.
- Developed a VGG16-based deep learning model to classify pecking events using the audio envelop and the spectrogram as input.
- Utilized Wandb to report and monitor the training process.
- Performed statistical analysis to compare the estimated results with the ground truth data.
- **Skills**: Computer Vision, Deep Learning, Data Curation, Precision Agriculture, PyTorch, Keras, Scikit-Learn, Wandb, Neural Networks, Audio Classification, Instance Segmentation, Semantic Segmentation, Statistical Analysis, Time Series Analysis, Data Visualization, Python, Pandas, Seaborn, Label-Studio, CVAT, Data Annotation, Linux

Kimia Motor Aug 2021 - Feb 2022

Research and Development Engineer Tehran, Iran

- Conducted an overview of the production processes and reported the bottlenecks with possible solutions to improve production efficiency.
- Designed and built an automated wire feeder for the brake production line and replaced it with an old feeder. The newly built feeder showed a higher precision, which led to a decrease in defective product rates. [GrabCAD]
- Designed a two-axis linear motion system for the company's car gear shifting system test bed. [GrabCAD]
- Developed the control software on a Delta DVP-SA2 PLC using ladder logic.
- **Skills**: Computer Aided Design (CAD), PLC Programming, Ladder Logic, Catia

Pars Ertebat May 2016 - Aug 2021

Fullstack Software Engineer Tehran, Iran

- Contributed to the development of a horse racing betting solution, achieving an annual revenue of $32 million for the Equestrian Federation of Iran, with over 70k users.
- Developed the back-end of a social media app containig authentication, user management, report generation, etc.
- Designed and developed the web version of a social media app.
- **Skills**: Object-Relational Mapping (ORM), WinForms, LINQ to SQL, SQL, JavaScript, Object-Oriented Programming (OOP), C#, ASP.NET MVC, .NET Framework, AngularJS, Visual Studio, Bootstrap, Microsoft SQL Server, Entity Framework, HTML, Cascading Style Sheets (CSS), ASP.NET Web API, JSON Web Token (JWT)

Parand Robotics Research Center Jan 2012 - Apr 2016

Undergrad Research Assistant Tehran, Iran

- Developed a fully autonomous humanoid soccer robot consisting of several modules like locomotion, vision, low-level IO, balancing, and behavior working in harmony to compete in Robocup soccer competitions. We managed to achieve several international awards, like the 1st place in Robocup2015 China and the 3rd place in Robocup2014 Brazil, among others. [GitHub] [Demo]
- Led the software development team and mentored the new members through the process.
- Developed a 4-phase pre-defined walking engine which was used in early versions of the robot.
- Developed a ball tracking system based on contour segmentation and a PID-controlled pan-tilt mechanism. [demo]
- Improved robot's walking speed by implementing an online omni-directional parametric bipedal walking trajectory generator with an PID stabilization and balancing module based on an integrated IMU sensor. [demo]
- Developed a multi-threaded modular software based on SOLID and object oriented (OOP) design principles.
- Developed a GUI-based key-frame motion editor software to design predefined motions.
- Implemented the low-level IO module to control servo actuators and read IMU sensor data.
- Developed an open source IMU based on Atmega32 microcontroller, containing a firmware, class libraries, configuration software ,and 3D simulator completely compatible with Dynamixel communication protocol. [GitHub] [Demo]
- Implemented a FSM-based module to control high-level robot behavior in orchestration with other modules.
- **Skills**: Teamwork, Research, Communication, Computer Vision, Machine Learning, Robotics, C, C#, .Net Framework, Embedded System Development, Software Engineering, Image Processing, OpenCV, Visual Studio

AWARDS

1st Place - Robocup Humanoid Soccer Teen-Size Robot League [Results] [Video] [TDP] Aug 2015 - Hefei, China

3rd Place - Robocup Humanoid Soccer Teen-Size Robot League [Results] [Video] [TDP] Aug 2014 - João Pessoa, Brazil

2nd Place - IranOpen International - Humanoid Soccer Kid-Size Robot League Apr 2016 - Tehran, Iran

1st Place - IranOpen International - Humanoid Soccer Kid-Size Robot League [Video] Apr 2015 - Tehran, Iran

1st Place - IranOpen International - Humanoid Soccer Teen-Size Robot League Apr 2015 - Tehran, Iran

1st Place - IranOpen International - Humanoid Soccer Teen-Size Robot League Apr 2013 - Tehran, Iran