Javad Amirian

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Research Interests

- Robot Vision
- Deep Learning and Generative Models
- Crowd Simulation and Human Motion Prediction

Education

• **PhD in Computer Science (Robotics and AI)** Jan. 2018 - Jul 2021
Inria Rennes (Rainbow Team), France
Thesis: Human Motion Trajectory Prediction for Robot Navigation (CrowdBot)
Supervisor: Dr. Julien Pettré
Co-Supervisor: Dr. Jean-Bernard Hayet

• **MSc in Computer Engineering (Artificial Intelligence)** Sept. 2012 - Sept. 2014
Sharif University of Technology, Tehran, Iran (1st Rank University in Iran)
Thesis: Dynamic Motion Planning and Obstacle Avoidance for Simulated Autonomous Car in Webots
Supervisor: Dr. Mansour Jamzad

• **BSc in Electrical Engineering (Electronics)** Sept. 2007 - Sept. 2012
Shahid Behesti University (National University of Iran), Tehran, Iran

Professional Experience

Head of AI @ Vive Tennis Mar. 2021 - Now
Vive Robotics is a tech startup that develops autonomous mobile robots. I am the CTO of the startup and the head of AI at Vive Tennis Robot project: an tennis-ball-retriever robot that uses computer vision and AI to localize itself, tennis balls and the players in the court.

Doctoral Researcher @ CrowdBot (European H2020 Research Project) Jan. 2018 - Jul. 2021
CrowdBot focuses on developing platforms and algorithms to ensure safe navigation of social robots. My main task is to develop tools for *Motion Prediction* of pedestrians around the robot, to improve robot navigation in crowd. I'm working on Crowd Simulation algorithms and Deep Learning models. As a result I developed a model called "Social-Ways" that uses Generative Adversarial Networks (GAN) to take agent's observed trajectories and predict multi-modal distribution of their future trajectories.

Computer Vision Engineer @ PixBall (Sepehr Co) May 2015 - Dec. 2017
PixBall is an AI startup providing smart solutions for sports video analysis. My task was developing image processing and machine vision algorithms and providing high-level API for the UI engineers. I contributed to PixArt, a video processing software for embedding graphical overlays and virtual advertisements into sports contents.

Computer Vision Engineer @ Spad System Co. Apr. 2016 - Nov. 2017
At Spad-system I started a project for automatic recognition of Iranian license plates (Didbaan). I developed a ALPR engine based on an open-source software (OpenALPR). We collected and annotated +5k plate images and trained the system to detect plates and recognize Persian letters. This software has been in use to manage the entrance and exit of cars from parkings in multiple sites.

Founder and Team Leader @ Cyrus (Team of Small-Size Soccer Robots) Jul. 2010 - Apr. 2015
I founded **Cyrus** under the supervision of Dr. Eslam Nazemi, during my undergrad study. I collaborated with more than 20 undergrad and graduate students that joined the team to develop hardware and software of the robots and prepare them for Robocup competitions. My main role was in the technical management of the project.

Selected Publications

- Gheisari, M., **Amirian, J.**, Furon, T. Amsaleg, L., **"AggNet: Learning to Aggregate Faces for Group Membership Verification,"** (**Preprint-2022**).
- Zhang, B., **Amirian, J.** Eberle, H., Pettré, J., Holloway, C., Carlson , T. **"Towards Safe Human-Robot Interactions in Crowds: Empirical Study of Pedestrian Dynamics with a Wheelchair and a Pepper Robot."** International Journal of Social Robotics (**SORO-2022**).
- **Amirian, J.**, Hayet, J. B., Pettré, J., **"What we see and What we don't see: Imputing Occluded Crowd Structures from Robot Sensing,"** (**Preprint-2021**).
- **Amirian, J.**, Zhang, B., Valente Castro, F., Baldelomar, J., Hayet, J. B., Pettré, J. **"OpenTraj: Assessing Prediction Complexity in Human Trajectories Datasets."** In Proceedings of the 15th Asian Conference on Computer Vision (**ACCV-2020**), Nov-Dec. 2020.
- van Toll, W., Grzeskowiak, F., Gandía, A.L., **Amirian, J.**, Berton, F., Bruneau, J., Daniel, B.C., Jovane, A. and Pettré, J., "**Generalized Microscopic Crowd Simulation using Costs in Velocity Space**,", In Symposium on Interactive 3D Graphics and Games (**I3D-2020**), May 2020.
- **Amirian, J.**, Van Toll, W., Hayet, J. B., Pettré, J. **"Data-Driven Crowd Simulation with Generative Adversarial Networks."** In Proceedings of the 32nd International Conference on Computer Animation and Social Agents (**CASA'19**), Jul. 2019.
- **Amirian, J.**, Hayet, J. B., Pettré, J., **"Social ways: Learning multi-modal distributions of pedestrian trajectories with GANs,"** IEEE Conference on Computer Vision and Pattern Recognition (**CVPR-2019**) Precognition Workshop, Jul. 2019.
- **Amiryan, J.**, Jamzad, M., **"Adaptive motion planning with artificial potential fields using a prior path,"** 3rd RSI International Conference on Robotics and Mechatronics (**ICROM**), 2015.

Professional Services

- **PC Member** of *ICRA Workshop on Long-term Human Motion Prediction* / 2021
- **Reviewer** @ Computer Animation and Virtual Worlds / 2021
- **Reviewer** @ *IROS* [4 papers] / 2021
- **Reviewer** @ *IEEE Robotics and Automation Letters (RA-L)* / 2020
- **Reviewer** @ *Computer Vision and Image Understanding* / 2020
- **Reviewer** @ *IEEE Transactions on Neural Networks and Learning Systems* / 2020
- **Subreviewer** @ *SIGGRAPH* / 2020
- **Subreviewer** @ *CASA* (Conference on Computer Animation and Social Agents) / 2018-2019
- **PC Member** of CrowdNav (IROS Workshop on Robot Navigation in Crowd) / 2018
- **Technical Committee** @ Robocup Iran Open - Small Size League / 2014 - 2017

Technical Skills

- **Programming Languages:** Python, C/C++, Matlab.
- **Deep Learning:** Pytorch, Keras (TensorFlow) — RNNs, GANs.
- **Version Control:** Git.
- **AI and Robotics Tools:** OpenCV, ROS, CARLA, Webots, Gazebo.
- **Software Development:** OOD; Concurrent and Multithread; Modular Programming.
- **Graphic Tools:** Adobe Photoshop, Adobe Premiere; 3ds Max.

Hobbies and Other Activities

- Occasional Blogging about AI, Tech, and Society (Instagram, Telegram)
- Hobby photography and videography
- Interested in football (soccer), hiking (if there is some mountain around), cycling, and power-lifting, and also supporting my favorite club: F.C. Perspolis club (Iran).

References

- **Dr. Julien Pettre**
  Research Scientist at Rainbow, Inria-Rennes, Brittany, France
  Email: julien.pettre@inria.fr
- **Dr. Jean-Bernard Hayet**
  Researcher at CIMAT, Department of Computer Science., Guanajuato, Mexico
  Email: jbhayet@cimat.mx
- **Dr. Mansour Jamzad**
  Department of Computer Engineering, Sharif University of Technology, Tehran, Iran
  Email: jamzad@sharif.edu