Eran Bamani Beeri

Postdoctoral Associate in Deep Learning, Computer Vision and Rehabilitation Robotics

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ACADEMIC APPOINTMENTS

- Postdoctoral Associate, The 77 Lab, Department of Mechanical Engineering, Massachusetts Institute of Technology (MIT), Cambridge, MA (Present – 2025).
    - Research specialization: Deep Learning, Computer Vision, Human-Robot Interaction and Collaboration, Rehabilitation Robotics, and AI-driven robotic assistance.

EDUCATION

- Ph.D. Mechanical Engineering, Tel-Aviv University (2021-2025). Specialization in **Deep Learning, Computer vision** and **Robotics**.
    - Fields: Deep Learning, Computer Vision, Human-Robot Interaction and Collaboration, Trajectory estimation. Programming in **Python** (**PyTorch** environment).
- B.Sc. & M.Sc. Electronic Engineering, Ariel University (2013-2019). Specialization in **Image Processing**, **Signal Processing** and **Machine Learning** for wireless communication.
    - Thesis: "Indoor radio wave propagation in the presence of scattering objects".
    - Project topic: "Detection and Recognition Drone with Machine Learning Algorithm"
    - Grades: average- 93.1, final examination – 96, thesis – 95 (ranking – **6 of 121** faculty students).
    - Programming: **MATLAB**, **Python** and **C++**.
    - Key courses: **Image Processing** and **Computer Vision**, information theory, **advanced Signal Processing**, estimation techniques, equalization techniques

PROFESSIONAL EXPERIENCE

Tel-Aviv University: Tel-Aviv, *Teaching Assistant*. 2021-2025.

- 0555312001 - Medical Image Processing 1, *Autumn Semester.*
- 0555452001 - Medical Image Processing 2 (computer vision), *Spring Semester.*

Hebrew University CS: Jerusalem, Computer Vision *Researcher*. 2020-2021.

- Fields: Computer vision, Medical imaging processing, Deep neural networks, Decompose objects in medical image using generative models.
- Programming and Software: Python (Torch environment), MATLAB RadiAnt and Slicer.

Primrose: Tel Aviv, *Researcher and Lecturer*. 2019-2023.

- Algorithm Development for Image Processing and Computer Vision. Design DNN architecture for Image Processing and Computer Vision tasks.
- Lecturer and Project instructor. Syllabus includes ML / DL / IP / CV.
- Collaboration: Worked with Rambam Hospital on the **identification of myopia disease** among children, using textual information from doctor-patient meetings.

Homeland Security Laboratory: Ariel University, *Research Scientist*. 2017-2019.

- Algorithm Development for Motion Detection and Geometrical-Based and Estimation for improving Radio Propagation Analysis.
- Project Instructor for 4th year B.Sc. students in their Research Project.

Ariel University: Ariel, *Teaching Assistant*. 2017-2019.

- 4331210 - Fundamentals of Signal Processing, *Autumn Semester.*
- 4330110 - Random Signals and Noise, *Spring Semester.*

SESP Group: Petah Tikva, *Algorithm Engineer, part time*. 2016-2017.

Conducting research and development in the field of classical Image Processing and Computer Vision, with a specific focus on the creation of a sophisticated motion detection algorithm.

OPEN SOURCE CONTRIBUTIONS

- GitHub account: https://github.com/eranbTAU

SOFTWARE ENGINEERING SKILLS

- Machine learning skills: Experienced with using, implementing, and analyzing most textbook machine learning algorithms. Experienced with developing new machine learning techniques.
- APIs, libraries, software frameworks: PyCharm, PyTorch, NVidia CUDA, OpenCV, ROS, Gazebo.
- Programming languages: experienced in C/C++, Java, Python, MATLAB.

PROJECTS AND PROFESSIONAL COURSES

- Deep Learning Academy. A 10-month course in Machine Learning and Deep Learning ***(2017)***.
- Systematics Ltd. Solutions at work – Signal Processing with MATALB ***(2016)***.
- INTERLLIGENT - RF & Microwave Solutions RF, Microwave and Communications ***(2015)***.

AWARDS

- Blavatnik Cambridge Fellowship, 2025 - Selected as one of the Blavatnik Fellows for postdoctoral research at the University of Cambridge.
- Outstanding Research Achievement - ME Graduate Research Award (PhD), 2023.
- Recognized for outstanding research contributions in HRI by the Israel Innovation Authority (IIA), 2022.
- Awarded research excellence recognition by the Israel Science Foundation (ISF), 2021.
- Awarded a Ministry of Defense (MAFAT) fellowship for excellence in research, 2017, 2018.

- Dean's list: second year of B.Sc., 2015.
- Dean's list and dean's award (full-tuition scholarship): first year of B.Sc., 2014.

COMMUNITY SERVICE

- Science Teacher, "Mifal-HaPayis" (2011-2013), supported school children from low socio-economic backgrounds by teaching Mathematics and Physics, providing academic assistance that their families could not afford.
- Science Teacher, Caroline & Joseph S. Gruss Life Monument Funds Inc. (2015-2017), provided educational support to students, teaching Electrical Engineering courses.
- Micro and Nano Fluidics and Robots non-profit project (2022-2023), Tel Aviv University, focused on quality sperm cell sorting for IVF. Developed computer vision algorithms to identify high-quality cells for selection, enhancing the system's ability to distinguish these cells from others and improving its effectiveness.
- Forensic Dental Identification Project, Abu Kabir Institute of Forensic Medicine (2023), provided expertise in image processing to assist researchers working on a forensic dental identification project following the events of October 7.

JOURNAL PAPERS

Bamani, E., Nissinman, E. and Sintov, A., From Voice to Action: Natural Language-Based Speech-to-Trajectory Control for Robots. Under review at *IEEE Robotics and Automation Letters*, 2024.

Bamani, E., Nissinman, E. and Sintov, A., Robust Dynamic Gesture Recognition at Ultra-Range Distances for Natural Robotic Guidance. Under review at *IEEE Robotics and Automation Letters*, 2024.

Atari, R., **Bamani, E.** and Sintov, A., Human Arm Pose Estimation with a Shoulder-worn Force-Myography Device for Human-Robot Interaction. *IEEE Robotics and Automation Letters*, 2025.

Bamani, E., Nissinman, E., Koenigsberg, L., Meir, I. and Sintov, A., A Diffusion-based Data Generator for Training Object Recognition Models in Ultra-Range Distance. *IEEE Robotics and Automation Letters*, 2024.

Bamani, E., Nissinman, E., Meir, I., Koenigsberg, L. and Sintov, A., Ultra-Range Human Gesture Recognition Using a Web-Camera for Robot Directive. *Engineering Applications of Artificial Intelligence*, 2024.

Bamani, E., Nissinman, E., Meir, I., Koenigsberg, L., Matalon, Y. and Sintov, A., Recognition and Estimation of Human Finger Pointing with an RGB Camera for Robot Directive. Under review at Advanced *Robotics Research. 2024.*

Bamani, E., Gurevich, A and Sintov, A., Learning a Data-Efficient Model for a Single Agent in Homogeneous Multi-Agent Systems. *Neural Computing and Applications , 35:20069–20085,* 2023.

Bamani, E., Kahanowich, N.D., Ben-David, I. and Sintov, A., Robust Multi-User In-Hand Object Recognition in Human-Robot Collaboration Using a Wearable Force-Myography Device. *IEEE Robotics*

and Automation Letters, *7*(1), pp.104-111, 2021.

Gerasimov, Y., Balal, N., **Bamani, E.**, Pinhasi, G. and Pinhasi, Y., 2020. Scaled Modeling and Measurement for Studying Radio Wave Propagation in Tunnels. MDPI Electronics.

CONFERENCE PAPERS AND WORKSHOPS

Bamani, E., Nissinman, E., and Sintov, A., 2025. Advancing Robot Navigation With Real-Time Voice-Guided Commands and Natural Language. **NVIDIA GPU Technology Conference (GTC)** 2025. Poster Presentation.

Bamani, E., Nissinman, E., Koenigsberg, L., Meir, I., and Sintov, A., 2025. Ultra-Range Gesture Recognition Using Diffusion Models: A Novel Approach for Synthetic Data Generation in Human-Robot Interaction. **IEEE International Conference on Robotics and Automation (ICRA)** 2025. Oral.

Bamani, E., Nissinman, E., and Sintov, A., 2024. Dynamic Gesture Recognition in Ultra-Range Distance for Effective Human-Robot Interaction. ***IEEE International Conference on Automation Science and Engineering.*** Workshop**.**

Bamani, E., Nissinman, E., and Sintov, A., 2024. Recognition of Dynamic Hand Gestures in Long Distance using a Web-Camera for Robot Guidance. ***IEEE International Conference on Robotics and Automation 40 (ICRA).*** **arXiv.**

Bamani, E., Kahanowich, N.D., Ben-David, I. and Sintov, A., 2023. Flip-U-Net for In-Hand Object Recognition Using a Force-Myography Device. ***IEEE International Conference on Robotics and Automation and the Israeli Conference on Robotics.*** **Oral.**

Bamani, E., Gurevich A, Azulay O and Sintov A., 2021 Open-Sourcing Generative Models for Data-driven Robot Simulations. **NeurIPS Data-centric AI 2021. Oral.**

Pinhasi, G., and **Bamani, E.** (2019) "Study of Human Body Effect on Wireless Indoor Communication", Israeli - Russian Bi-National Workshop 2019, February 18 - 19, 2019, Ein Bokek.

SEMINARS and MEDIA COVERAGE

HRI Consortium, 2022: "Natural Robot Guidance Using Human Gestures at Ultra-Range Distance with a Web Camera."

Weekly Robotics #255, 2023: Recognition and Estimation of Human Finger Pointing with an RGB Camera for Robot Directive" (Link).

Ariel University, 2018: "Motion Detection in an Enclosed Space in the Presence of Scattering Objects."

REVIEWER

- Pattern Recognition, *Elsevier.*
- ACM Transactions on Human-Robot Interaction (THRI)
- *Engineering Applications of Artificial Intelligence (EAAI), Elsevier*.
- *IEEE/RSJ International Conference on Intelligent Robots and Systems (*IROS 2024*).*
- *IEEE Conference on Automation, Science and Engineering.*

Membership and ACTIVITE

- Member of IEEE Robotics and Automation Society (RAS).
- Member of Computer Vision Foundation (CVF).
- Member of International Association for Pattern Recognition (IAPR).