Eran Bamani

Deep Learning and Robotics student (Ph.D.)

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EDUCATION

- Ph.D. Engineering, Tel-Aviv University. Specialization in **Deep Learning** and **Robotics**. Expected graduation: 2021-2025.
    - Fields: Deep neural networks, Machine learning, Human-Robot Collaboration, Trajectory estimation. Programming in **Python** in PyCharm and **PyTorch** environments.
- Ph.D. Computer Science, Hebrew University. Specialization in **Deep Learning** and **Computer Vision**. Non graduate: 2020-2021.
    - Fields: Medical imaging processing, Deep neural networks, Decompose objects in a medical image. Development of algorithms to identify bones in medical images. Decompose objects from X-rays with neural networks. Programming in python in PyCharm and PyTorch environments
    - Programming and Software: Programming in **Python** in **PyCharm** and **PyTorch** environments, MATLAB. Software: RadiAnt and Slicer.
- M.Sc. Electronic Engineering, Ariel University. GPA: 92. Specialization in **Signal Processing** and wireless communication. Graduated: October 2019.
    - Thesis: "Indoor radio wave propagation in the presence of scattering objects", developed an algorithm for detection of human body and building models that describe how much the body influences the power received. The algorithm was written in **MATLAB** and the experiments performed in the field.
    - Key courses: **Image Processing** and **Computer Vision**, information theory, **advanced Signal Processing**, estimation techniques, equalization techniques
- B.Sc. Electronic Engineering, Ariel University. Specialization in Signal Processing, Image Processing and wireless communication including courses in **C++ programming**. Graduated: October 2017.
    - Project topic: "Detection and Recognition Drone with Machine Learning Algorithm" I used SVM and Stochastic Gradient Descent to detect drone from features. Python coding on **PyCharm** framework, **OOP**, **NumPy**, Pandas, **OpenCV**. *Two-semester project.*
    - Key courses: Digital communication, signal processing including **Fourier Transform**, Communication techniques, Coding theory.

PROJECTS AND PROFESSIONAL COURSES

- Primrose – Deep Learning Academy. This is a high-level Algorithm Development course and advanced technological training. A 10-month course that combines the mathematics of Machine Learning and practical experience in Python includes the use of Algorithms for practical problems and the implementation of the Algorithms being studied.
    - Syllabus includes: Supervised learning: Linear Regression, Decision Trees, SVM. Unsupervised learning: Dimensionality reduction: PCA, K-means, clustering. NLP, Bootstrapping, Markov models. Deep learning: DNN, CNN, RNN, network architectures. Hands-on experience in Python, TensorFlow, TensorBoard.
- Systematics Ltd. Solutions at work – signal processing with MATALB.

This course shows how to analyze signals and design signal processing systems using MATLAB, Signal Processing Toolbox, and DSP System Toolbox.
    - Syllabus includes: Creating and analyzing signals, Performing spectral analysis, Designing and analyzing filters, Designing multirate filters, Designing adaptive filters.
- INTERLLIGENT - RF & Microwave Solutions RF, Microwave and Communications.
A comprehensive RF & Microwave training program for electrical engineers and RF engineers who seeks to become RF specialist. This program combines in-depth theoretical studies and practical lab sessions. A total of 136 hours.

RECENT WORK AND RESEARCH EXPERIENCE

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

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

Primrose - Deep Learning Academy: Tel Aviv, *Lecturer and Teaching Assistant*. 2019-present.

- Algorithm Development for Image Processing and Computer Vision. Design CNN architecture for image decomposition, research in medical field.
- Lecturer and Project instructor. Syllabus includes: ML / DL / IP / CV.

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

- Algorithm Development for motion detection, designing and analyzing filters, development of geometrical-based and estimation-based algorithms for improving radio propagation analysis.
- Project Instructor for 4th year B.Sc. students in their Research Project.
- Teaching Assistant and Lab Instructor: Probability and Statistics for Engineers and Scientists - Mathematics/4320610, Fundamentals of Signal Processing/4331210, Random Signals and Noise/4330110.

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

Development of detection and recognition algorithms, implemented image and signal processing algorithms. Development of a motion detection algorithm. Research and development work on classic computer-vision. Experience in lab equipment: scope, spectrum analyzer and network analyzer.

Ariel University: Ariel, *Research Assistant*. 2015-2016.

Signal analysis in MATLAB, design in EM simulators: ADS, CST, Antenna Magus and RF lab equipment. Experience in RF lab work (network analyzer, spectrum analyzer, Function generator, oscilloscope).

PAPERS

Real-to-Sim-to-Real: Learning Models for Homogeneous Multi-Agent Systems

Bamani, E., Kahanowich, N.D., Ben-David, I. and Sintov, A., 2021. 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.**

CONFERENCE PAPERS

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

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

Live talk

https://neurips.cc/virtual/2021/workshop/38185

OPEN SOURCE CONTRIBUTIONS

- GitHub account: https://github.com/eranbTAU
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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: NumPy / SciPy, Pandas, Spyder, PyCharm, PyTorch, NVidia CUDA, OpenGL, OpenCV, ROS, Gazebo, solidworks.
- Programming languages: experienced in C/C++, Java, Python, MATLAB.