BEN BENYAMIN

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EDUCATION

Northwestern University, *Evanston, IL* - M.S. in Robotics **Sep 2024 - Dec 2025 (expected)**
Tel Aviv University, *Tel Aviv, Israel* - B.Sc. in Mechanical Engineering **2016 - 2020**

SKILLS

Software Development: C++, C, Python, Unit Testing, Git, Docker, Linux, OpenMP, Spark SQL

Machine Learning: PyTorch, Triton, Q-Learning, PyTorch Lightning, MLflow, Databricks, Reinforcement Learning

Robotics: ROS 2, SLAM, OpenCV, Microcontrollers, Computer Vision, PX4, AprilTag, IsaacSim

Mechanical and Electrical: SolidWorks, Milling, CNC, Sheet Metal, 3D Printing (FFF), PCB Design

Languages: English (Fluent), Mandarin Chinese (Proficient), Hebrew (Native)

PROJECTS

Reinforcement Learning for Delayed Robotic Control **Fall 2025**

- Built a delay-aware PPO/RecurrentPPO framework in Stable-Baselines3 for Hello Robot Stretch
- Trained the robot to play Atari Pong 2600 while modeling real-world latency and sensor delay
- Integrated model inference within the ROS 2 control stack for real-time policy execution and adaptive motor response

RGBD-Based 6D Pose Estimation and Object Grasping **May 2025**

- Integrated DenseFusion pose estimation, SAM segmentation, and ROS 2 motion planning into a unified RGBD grasping pipeline using an Intel RealSense D405 and Franka Emika arm
- Deployed and validated the full system with synthetic and real data from Isaac Sim, enabling reliable 6D pose detection and autonomous object grasping

Large Language Model from Scratch (GPT-2 124M) **May 2025**

- Optimized inference speed and coherence via mixed precision, dynamic batching, and targeted fine-tuning
- Achieved a 2.99 validation loss on the FineWeb-Edu dataset

Autonomous Drone for LiDAR-Based SLAM **March 2025**

- Developed a PX4-based LiDAR-driven SLAM stack for autonomous drone navigation
- Integrated PX4 flight control with ROS 2 navigation and mapping stacks in C++, running on an onboard companion computer

Computer Graphics Renderer in C++ **March 2025**

- Designed and implemented a full real-time 3D rasterization pipeline in C++, built entirely from scratch without external libraries
- Developed custom linear algebra and STL parsing modules to transform and render complex triangle-mesh 3D models
- Implemented projection, z-buffering, and per-triangle shading logic to simulate GPU-style rendering on the CPU

EXPERIENCE

Loram Maintenance of the Way *Medina, Minnesota* **July-September 2025**
Machine Learning / Artificial Intelligence Intern

- Built a PyTorch Lightning segmentation model with custom Dice/Focal Loss and depth-specific augmentations
- Engineered a Spark SQL data pipeline and modular PyTorch DataModule for large-scale training workflows
- Deployed the model on Databricks as a TorchScript endpoint with MLflow experiment tracking and versioning

Automata – Advanced Automation Solutions *Hod Hasharon, Israel* **2022 – 2024**
Mechanical Engineer

- Designed and prototyped cost-efficient mechanical enclosures for electronic automation systems
- Supported integration of PCBs, sensors, and actuators into automated assemblies for industrial clients

Automatica – Automation and Control Technologies Ltd. *Kfar Saba, Israel* **2020 – 2021**
Mechanical Engineer

- Revamped two automated production lines for a medical chemotherapy product, including mechanical layout redesign and pneumatic integration
- Worked alongside controls and electrical engineers to integrate servo motors, feeders, and motion subsystems into the production workflow