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**
GPA: 93/100 , Dean's List

NTNU Mandarin Training Center, Taiwan – Mandarin Language Studies **2023**

SKILLS

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

Machine Learning: PyTorch, Keras, Data Augmentation, Q-Learning

Robotics: ROS 2, SLAM, OpenCV, Microcontrollers, Computer Vision

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

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

Interests: Electric guitar, Hiking, Biking, Video Games

PROJECTS

Computer Graphics Renderer from Scratch in C++

- Built a complete 3D rendering pipeline in C++ without any external graphics libraries
- Implemented rasterization, z-buffering, and STL file parsing from first principles
- Wrote core projection, transformation, and triangle filling logic using vector math

Point Cloud Object Detection with RGBD

- Implemented PointNet in Python using PyTorch for RGBD-based object classification
- Tackled point cloud orderlessness and occlusion challenges in real-world scenes
- Generated a synthetic dataset in Isaac Sim, reaching 70% test accuracy on 16,000+ samples

Whack-a-Mole Playing Robot

- Programmed Franka Emika arm to play Whack-a-Mole using ROS 2
- Used Intel RealSense (RGBD) camera and AprilTags for mole detection
- Leveraged OpenCV for tracking and action coordination

6D Pose Estimation with DenseFusion

- Implemented DenseFusion architecture from scratch using PyTorch for 6D object pose estimation from RGB image
- Designed and trained segmentation model from scratch to enable accurate object mask extraction
- Generated a fully labeled synthetic RGB dataset in Isaac Sim with varied object poses and scene conditions

LiDAR Equipped Simultaneous Localization and Mapping (SLAM)

- Deployed a PIXHAWK PX4-equipped drone for SLAM-based mapping using a 2D LiDAR
- Integrated the drone into the ROS 2 ecosystem using C++, with mapping packages running on an onboard laptop

Assistive Exoskeleton for Arms

- Prototyped an exoskeleton to assist individuals with muscle weakness due to peripheral nerve conditions
- Designed components in SolidWorks and fabricated parts using CNC machining, sheet metal, and 3D printing
- Recognized by the Faculty of Engineering for exceptional performance at the 2020 Graduation Project Exhibition

EXPERIENCE

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

- Prototyped mechanical enclosures for electronic systems, with focus on cost-effective manufacturing
- Developed streamlined PCBs and custom mechanical systems tailored to client requirements

Automatica – Automation and Control Technologies LTD *Kfar Saba, Israel* **2020–2022**
Mechanical Engineer

- Redesigned two medical production lines, including mechanical layout and integration of the pneumatic system

Israel Defense Force - Platoon Medic **2013–2016**