

# Yael Ben Shalom

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## EDUCATION

### **MS in Robotics, Northwestern University, USA**

📅 Sep 2020 - Dec 2021 (Expected)

- Coursework Focus – Machine Learning, Perception, Navigation, Computer Vision, Robotics Manipulation. Current GPA – 3.9/4.0.

### **BS in Mechanical Engineering, Tel Aviv University, Israel**

📅 Sep 2014 - Jul 2018

- Majored in Robotics and Autonomous Systems – Dynamics, Mechatronics, and Control.

## PROFESSIONAL EXPERIENCE

### **Robotics Software Engineer Intern, Augean Robotics (Burro), USA**

📅 Jun 2021 - Sep 2021

- Developed real-time vision-based obstacle avoidance and path-following methods, using reinforcement learning algorithms.
- Built a robotic arm motion planning algorithm that leverages sensors to enable autonomous harvesting while avoiding collision.
- Designed and integrated a state-machine architecture that improves runtime efficiency, modularity, and failure recovery ability.
- Implemented production-level code for a large fleet of autonomous ground vehicles, ensuring a high degree of reliability.

### **Mechanical Engineer, R&D Department, Elbit Systems, Israel**

📅 Jun 2016 - Jul 2020

- Designed the electrical packaging of 5 electro-optic systems in core \$4M products, with 70+ units each.
- Led three award-winning mechanical concepts; each received a \$250K grant from the Israeli Chief Scientist.
- Initiated a study to reduce manufacturing time and costs of 3D-printed products; reduced 3D-printed prototype costs by 50% by introducing new materials, increasing printers' utilization, and optimizing printing requirements.

### **Technical Program Manager, Intelligence Corps Technological Unit (81), Israel Defense Forces, Israel**

📅 Nov 2012 - May 2013

- Coordinated a cross-functional project team of 100+ people from defining requirements to product launch under tight schedule.
- Received Colonel's Award for Outstanding Performance and Leadership.

### **Electrical Technician, Intelligence Corps Technological Unit (81), Israel Defense Forces, Israel**

📅 Nov 2010 - Nov 2012

- Served as a team leader's expert on electro-optic systems manufacturing and testing.
- Specialized in research, development, manufacturing, quality assurance (QA), and integration of electro-optic systems.

## SELECTED PROJECTS

🔗 [yaelbenshalom.github.io](https://yaelbenshalom.github.io)

### **Recycling Robot with Machine Learning and Computer Vision Perception – Northwestern University**

[Website]

Robotic Manipulation, Machine Learning, Motion Planning, Computer Vision, Image processing, Range Imaging, ROS, Python

- Programmed and controlled a Baxter robot to accurately pick and place a mixture of objects into different recycle bins, with more than 95% accuracy. Used inverse kinematics, MoveIt motion planning framework, and machine-learning-based classifier.
- Created a machine-learning-based trash classification and segmentation software to recognize, classify, and localize more than 60 recyclable object types in a real-time image.

### **Motorized Prosthetic Elbow – Northwestern University**

[Website]

Rehabilitation Robotics, Medical Devices, Mechatronics, Feedback Control Systems, PID Controller, PCB Design, SolidWorks, C

- Designed, built, and controlled a motorized prosthetic elbow that imitates healthy arm motion to help amputees prevent falling, avoid injuries, and maintain balance while walking.
- Defined precise system requirements by analyzing dozens of arm movement data patterns and simulating full arm dynamics.

### **EKF SLAM from scratch on Turtlebot3 – Northwestern University**

[Website]

Differential Drive Kinematics, EKF SLAM, Feature detection, Unsupervised Learning, Path Planning, ROS, C++

- Performed feature-based EKF SLAM on Turtlebot3 from scratch, using a 2D-LiDAR scanner.
- Implemented Extended-Kalman-Filter SLAM and landmark detection with Unknown Data Association.
- Wrote a 2D Kinematics library in C++ for differential drive robots, with complete unit testing.

### **Robot Navigation and Control inside a Maze – Tel Aviv University**

[Website]

Autonomous Vehicle, AI, SLAM, Mechatronics, Motion Planning, Path Planning, Arduino, C++

- Built a wheeled robot and coded it to navigate autonomously through an obstacle course using an embedded microprocessor, motors, and distance sensors (IR, TOF, and ultrasonic); applied real-time adaptive motion control.

## SKILLS & ADDITIONAL INFORMATION

- **Programming:** Python, C, C++, Matlab, HTML, CSS, JavaScript, Simulink, Git, Linux.
- **Robotics:** Robot Operating System (ROS), TensorFlow, PyTorch, OpenCV, MoveIt, Gazebo, Rviz, CoppeliaSim, Arduino.
- **Mechanical Engineering:** SolidWorks, Altair Inspire, Ansys, CFdesign, SolidWorks Visualize, 3D printing.
- **Electrical Engineering:** Eagle, PCB manufacturing, soldering.
- Volunteered as a mentor in Cracking the Glass Ceiling, empowering underprivileged young women to pursue STEM education.