Yael Ben Shalom

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EDUCATION

MS in Robotics, Northwestern University, USA **Sep 2020 - Dec 2021**
- Coursework Focus – Robotics Manipulation, Mobile Robotics, Controls, Planning, Perception, and SLAM GPA – 3.94/4.00

BS in Mechanical Engineering, Tel Aviv University, Israel **Sep 2014 - Jul 2018**
- Majored in Robotics and Autonomous Systems – Dynamics, Mechatronics, and Control GPA - 87.0/100.0

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 3 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 a 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

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, Path Planning, Feature Detection, Unsupervised Learning, ROS, C++
- Implemented feature-based Extended-Kalman-Filter SLAM and landmark detection with Unknown Data Association on Turtlebot3, using 2D-LiDAR sensor data; programmed a full package from scratch in C++ with object-oriented design
- 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, encoders, and distance sensors (IR, TOF, and ultrasonic); applied real-time adaptive motion and path control

SKILLS & ADDITIONAL INFORMATION

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