Yael Ben Shalom

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EDUCATION

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

Bachelor, BS in Mechanical Engineering – ***Tel Aviv University, Israel*** ***Sep 2014 – Jul 2018***
- Majored in Robotics and Autonomous Systems – Dynamics, Mechatronics, and Control GPA - 87/100

PROFESSIONAL EXPERIENCE

Robotics Software Engineer Intern – ***Augean Robotics (Burro), Philadelphia, PA*** ***Jun 2021 – Sep 2021***
- Developed real-time vision-based obstacle avoidance and path-following methods, using reinforcement learning algorithms
- implemented a robotic manipulation motion planning algorithm that enables autonomous harvesting while avoiding collision
- Designed and integrated a state-machine architecture that improves runtime efficiency, modularity, and failure recovery ability
- wrote production-level code for a large fleet of autonomous ground vehicles, ensuring a high degree of reliability

Mechanical Engineer – ***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 – ***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 – ***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***

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***

Rehabilitation Robotics, Medical Devices, Mechatronics, Feedback Control Systems, PD Controller, PCB Design, SolidWorks, Python, 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 – ***Northwestern University***

Differential Drive Kinematics, EKF SLAM, Path Planning, Feature Detection, Unsupervised Learning, ROS, C++
- Implemented a 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 – ***Tel Aviv University***

Autonomous Vehicle, Artificial Intelligence, Navigation, Mechatronics, Control, 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, 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