Levi Todes

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Education

- **Northwestern University** — **Evanston, Illinois**
  Master of Science in Robotics — *(Expected) Dec 2019*
- **University of Cape Town** — **Cape Town, South Africa**
  Bachelor of Science in Engineering Mechatronics — *Dec 2017*

Experience

- **Trossen Robotics** — **Downers Grove, Illinois**
  Robotics Engineering Intern — *August - September 2019*
  - Building CAD models and URDFs of robotic arms for use in a ROS package. Assisted with architecture of ROS package.
  - Experience with Lidar and RealSense Camera.
- **NxR Lab (Northwestern University)** — **Evanston, Illinois**
  Research Assistant — *July 2019*
  - CAD design of an enclosed, hexagonal maze with obstacles designed for repeatable, experimental use within the lab.
- **Balancell** — **Cape Town, South Africa**
  Mechatronics Engineer — *May - August 2018*
  - Engineering startup building 'smart' Lithium Ferro Phosphate Battery Packs for industrial use.
  - Developed test rigs (designing and building circuits and programming microcontrollers) for their equipment and circuits.
- **Bioelectronics and Neuroscience (BENS) Research Group** — **Sydney, Australia**
  Intern — *Nov – Dec 2016*
  - Controlled/programmed a multi-axial automated camera rig, tracking a light, sound or movement.
  - Designed a Piezo-electric sensing board that could determine where on a board a ping pong ball bounced.
- **Cape Peninsula University of Technology** — **Cape Town, South Africa**
  Trainee — *Nov 2014*
  - Practical training in arc welding;lathe machining; pneumatics; metrology; CNC machining; heat tempering and CAD.

Skills

- **Software**
  - C, C++, Java, MATLAB, Python
  - ROS, Git, TeX, Mathematica, Arduino IDE, Linux and Windows
- **Electrical**
  - PCB Design (Altium, Eagle, kiCAD), LT Spice, Simulink, LabView, Soldering
  - Control Theory - PID, lead-lag, robust, digital and analogue implementation
- **Mechanical**
  - CAD Design (Onshape, Fusion360, SolidWorks), Laser Cutting, 3D Printing
- **Languages**
  - English (native), Afrikaans, Hebrew

Notable Projects

- Human-Robot Ukulele Player. **CAD Design, construction** and **C** programming of a PIC32 microntroller as well as **Python** programming a user inteface for a ukulele player, capable of playing songs while a human strums.
- Test rig for Balancell battery circuit. Serial communication between bed of nails jig, computer and various oscilloscopes using **Java, Python and Arduino**. Use of Altium for **PCB design.**
- Automated tuning of a ukulele with a Sawyer robotic arm. Implemented **Python** nodes in **ROS** to listen to a ukulele note and make a Sawyer robotic arm tune a ukulele string accordingly.
- Moving object detection from moving backgrounds. Used **C++ and OpenCV** to perform an inquest into computer vision methods to detect objects in moving backgrounds. (My undergraduate thesis).
- DC Motor Controller. **MATLAB** client sends and receives information to/from PIC32 microntroller **(C)** which implements two **PID Control** loops to track trajectory, velocity or torque.
- Line following quadrapedal and wheeled robots. **C programming** of STM32 and PIC32 microcontrollers, also mechanical(**CAD**) and electrical design.