

Roumen Guha

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Former automotive engineer transitioning to robotics, with extensive experience in embedded systems and system integration. Looking for Summer 2020 **graduate** internship or co-op in robotic sensing and motion-planning.

Experience

- Dec 2016 - **Controls & Electrical Team Lead**, *Wisconsin Hybrid SAE Vehicle Team*, Madison, WI.
- May 2018 Managed team to completion of converting a stock SUV into an **electric vehicle** with 35-mile range, in **under 4 months**.
- o Developed motor control code for **driving and regenerative braking**, improving range on a single charge.
 - o Managed student team to **integrate a small ethanol engine** into our electric vehicle to achieve a range-extended hybrid.
 - o Planned, designed, built, wired and wrote code for a dynamometer over summer. Used by several vehicle teams for testing.
 - o Performed high-voltage wiring, built and debugged vehicle wiring-harness, and integrated power electronics.
 - o Worked with **Simulink**, **MotoHawk**, **MotoTune**, **CANoe**, **CANdb++** and other Woodward and Vector development tools and software.
- Sept 2014 - **Team Member**, *Wisconsin Hybrid SAE Vehicle Team*, UW-Madison.
- May 2018
- o Assisted in the implementation of a load dump and high-voltage battery, allowing dynamometer to continue for longer periods without stopping.
 - o Integrated temperature control sensors onto the vehicle network, allowing easy driver-monitoring of battery state.
 - o Successfully debugged and resolved issue with battery voltage sags shutting down the electric motor.
- Sept 2017 - **Undergraduate Teaching Assistant**, *Department of Electrical & Computer Engineering*, UW-Madison.
- Dec 2017
- o Assisted **Professor Barry Van Veen** in teaching an introductory undergraduate signal processing course.
 - o Supervised lab assignments. Validated assignment questions.
- May 2015 - **Help Desk Agent**, *Division of Information Technology (DoIT)*, Madison, WI.
- July 2016
- o Successfully resolved technical issues with **80 university members every week**, while **working 15 hours/week**.
 - o Recognized by grateful callers for going above and beyond my responsibilities.

Education

- 2019–2021 **M.S., Electrical Engineering**, *University of California San Diego*, Focus: Robotics, Advanced courses: Sensing & Estimation, Planning/Learning, Neural Networks, Autonomous Driving.
- 2014–2018 **B.S., Electrical Engineering & Math**, *University of Wisconsin-Madison*, Dean's Honors, AMCHAM Scholarship, Advanced courses: Robotics, Machine Learning, Image Processing, Optimization, Artificial Intelligence.
GPA: 3.4

Favorite Projects

Most of these can be found on my GitHub page.

- Nov 2017 - **Dancing Robot.**
- Dec 2017
- o Built a dancing robot arm with a robotic arm, utilizing **inverse kinematics** and a **DSP-based beat-tracker**.
 - o Programmed using **ROS** in **Python** on a **Raspberry Pi**.
- Nov 2017 - **MLSP 2014 Schizophrenia Classification Kaggle Challenge.**
- Dec 2017
- o Built a schizophrenia **classifier** in **MATLAB**.
 - o **PCA**, **LDA** and **clustering** techniques were employed under a serious time-constraint.
- Nov 2017 - **Brush Stroke Classification.**
- Dec 2017
- o Wrote a **Mathematica** image processing routine to **classify** Van Gogh's brush strokes in his lesser known sketches.
- Sept 2017 - **Stop Sign Detection.**
- Oct 2017
- o Coded a **Mathematica** image processing routine that **detected stop signs** in a class-provided dataset with 98% accuracy.
 - o Utilized classical techniques such as **segmentation**, **filtering**, **dilation and erosion**, **opening and closing**.
 - o **Won Silver in class competition.**
- Apr 2017 - **Tesla's Positioning Problem.**
- May 2017
- o Modeled the problem of Tesla's charging infrastructure, and found an **optimal solution** that would **minimize costs** while spreading out the stations according to usage statistics, travel time, and while **minimizing waiting times** at the stations.
 - o Taught myself the Julia programming language.

Skills

- Advanced MATLAB, Simulink, C, Java, Mathematica
- Intermediate ROS, C++, Python, Julia, Git, Bash, Altium, Quartus, SPICE, ARM Assembly, Raspberry Pi, Cortex-M4