

# Roumen Guha

roumen.guha@gmail.com • +1 (469) 328-3442 • roumenguha.github.io • linkedin.com/in/roumenguha

SUMMARY	Multilingual graduate electrical engineering student looking for opportunities in <b>robot sensing, distributed robotics</b> and <b>robot motion planning</b> . Open for <b>Summer 2020</b> .		
EXPERIENCE	<b>Wisconsin Hybrid SAE Vehicle Team, UW-Madison</b>		
	▪ Controls and Electrical Team Lead		Dec 2016 – May 2018
	<ul style="list-style-type: none"><li>• Converted a stock 2009 Ford Escape into an electric vehicle with 35-mile range, in under 4 months.</li><li>• Developed motor control code for driving and regenerative braking; performed high-voltage wiring, built and troubleshot vehicle wiring-harness, and integrated power electronics.</li><li>• Managed student team to integrate a small ethanol engine into our electric vehicle to achieve a range-extended hybrid.</li><li>• Worked with <b>Simulink</b>, <b>MotoHawk</b>, <b>MotoTune</b>, <b>CANoe</b>, <b>CANdb++</b> and other Woodward and Vector development tools and software.</li><li>• Planned, designed, built, wired and wrote code for a dynamometer over summer.</li></ul>		
	▪ Team Member		Sep 2014 – May 2018
	<ul style="list-style-type: none"><li>• Integrated temperature control sensors onto the standard SAE J1939 vehicle bus.</li><li>• Assisted in the implementation of a load dump and high-voltage battery.</li><li>• Successfully debugged and resolved issue with battery voltage sags shutting down electric motor.</li></ul>		
	<b>Department of Electrical &amp; Computer Engineering, UW-Madison</b>		
	▪ Undergraduate Teaching Assistant		Sep 2017 – Dec 2017
	<ul style="list-style-type: none"><li>• Assisted <b>Professor Barry Van Veen</b> in teaching <b>ECE 203 — Signals, Information, and Computation</b>.</li><li>• Supervised lab assignments. Validated questions.</li></ul>		
	<b>Division of Information Technology (DoIT), UW-Madison</b>		
	▪ Help Desk Agent		May 2015 – Jul 2016
EDUCATION	<ul style="list-style-type: none"><li>• Successfully resolved technical issues with 80 university members every week, while working 15 hours/week.</li><li>• Recognized by grateful callers for going above and beyond my responsibilities.</li></ul>		
	<b>University of California-San Diego, San Diego, California, USA</b>		
	▪ M.Sc. Electrical Engineering		2019 – Present
	<ul style="list-style-type: none"><li>• Focus: Intelligent Systems, Robotics &amp; Control</li></ul>		
	<b>University of Wisconsin-Madison, Madison, Wisconsin, USA</b>		
	▪ B.Sc. Electrical Engineering and Mathematics		2014 – 2018
	<ul style="list-style-type: none"><li>• Cumulative GPA: 3.4 / 4.0</li></ul>		
	▪ Awards and Honors		
	• <b>Dean's Honor List</b> , UW-Madison		2014 – 2017
	• <b>AMCHAM-MACEE 2014 Scholarship</b> , American Chamber of Commerce		2014 – 2018
ADVANCED COURSEWORK	<b>UCSD (Expected):</b> Sensing & Estimation, Planning/Learning, Neural Networks, Autonomous Driving Systems		
	<b>UW-Madison:</b> Robotics, Machine Learning, Image Processing, Optimization, Artificial Intelligence		
PROJECTS	<ul style="list-style-type: none"><li>▪ <b>Dancing Robot:</b> Built a dancing robot arm with a robotic arm, programmed in <b>Robot Operating System (ROS)</b> and <b>Python</b> on a <b>Raspberry Pi</b>. Video demo available <a href="#">here</a>.</li><li>▪ <b>MLSP 2014 Schizophrenia Classification Kaggle Challenge:</b> Built a schizophrenia <b>classifier</b> in <b>MATLAB</b>. <b>PCA</b>, <b>LDA</b> and <b>clustering</b> techniques were employed under a serious time-constraint. Code and write-up available <a href="#">here</a>.</li><li>▪ <b>Brush Stroke Classification:</b> Wrote a <b>Mathematica</b> image processing routine to <b>classify</b> Van Gogh's brush strokes in his lesser known sketches that experts have trouble with.</li><li>▪ <b>Stop Sign Detection:</b> Coded a <b>Mathematica</b> image processing routine that would <b>detect stop signs</b> in a class-provided dataset with 98% accuracy. <b>Placed Silver in class competition</b>. Code and write-up available <a href="#">here</a>.</li><li>▪ <b>Tesla's Positioning Problem:</b> Modeled the problem of Tesla's charging infrastructure, and found an <b>optimal solution</b> that would <b>minimize costs</b> while spreading out the stations according to usage statistics, travel time, and while <b>minimize waiting times</b> at the stations. Developed in <b>Julia</b>; hosted <a href="#">here</a>.</li><li>▪ <b>PCB Business Card:</b> <b>Designed, built, tested and debugged</b> a <b>PCB business card</b> in <b>Altium Designer</b>, programmed a Cortex-M4 in <b>C++</b> to control LEDs and a buzzer, and read touch input to make the system interactive. Utilized <b>JTAG</b> debuggers.</li></ul>		

- **MicroMarioBros:** Programmed Cortex-M4s in **C** and **ARM assembly** to play Super Mario Bros. World 1-1, complete with music. Implemented drivers for **SPI, I2C, UART and PWM**. Project involved use of **PWM, timers, interrupts, EEPROM, and a touchscreen LCD**. Code and write-up available [here](#).
- **DIY Guitar Pedal Board:** Programmed a TI DSP+ARM board in **C** to implement **real-time audio signal processing** algorithms. Programmed board with **tremolo, flanging and chorus sound effects**. Also implemented **FIR and IIR digital filters in C**, as well as **frame-based DSP**. Implemented the FFT through **TI's DSPLIB**.

## SKILLS

**MATLAB/Simulink, C/C++, Robot Operating System (ROS), Python, Git, Altium Designer, Altera Quartus II, SPICE, Bash, Java, ARM Assembly, Julia, Mathematica, Woodward MotoHawk, Woodward MotoTune, Vector CANoe, Vector CANdb++**