MICHAEL LU

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Education

Massachusetts Institute of Technology, Cambridge, MA *Class of 2023*

- Candidate for Bachelor of Science in Electrical Engineering and Computer Science.
- Coursework: Circuits and Electronics, Toy Product Design, Physics Electricity and Magnetism, Intro to Machine Learning, Intro to Algorithms, Mathematics of Computer Science, Intro to Game Design.

Work Experience

Electrical and Software Engineering Intern, ABB, Richmond, VA *Jun - Aug 2020*

- Collaborated with electrical engineers to create a cross-platform computer application with Qt (C++) to configure and read data from ABB's Power Distribution Unit (PDU) logic boards.
- Implemented a dynamic queue to store Modbus RTU communication queries between the application and the PDU logic boards, which sped up communication speeds and data refresh rates by 53%.
- Created a graphical user interface to generate configuration script files for the PDU logic board.

Contracted Product Designer, 10XBeta, Brooklyn, NY *Oct - Jun 2019*

- Collaborated with mechanical engineers and product designers to develop a prototype for an autonomous robotic car that would pace long-distance runners.
- Integrated electronic sensors, custom 3D-printed parts, and an Arduino microcontroller for autonomous control of an RC car chassis.
- Improved the robot's PID line-following algorithm.
- Designed custom sensor mounts for the robot on Solidworks and 3D printed them with an SLA printer.
- Documented the software and hardware (CAD files, electronics schematic, materials, assembly instructions) for future development of the project.
- Reduced the weight of the company's original prototype by 34% and size by 40%.

Contracted Electronics Developer, Greenberg Cosmetic Surgery, Great Neck, NY *Feb - May 2019*

- Worked with a plastic surgeon to design a small disposable vibrating medical device that reduced pain during cosmetic surgery through vibrations.
- Tested vibration magnitudes and frequencies with different button cell batteries from 1.5V - 3V.
- Contacted electronics manufacturers to source parts that reduced the device's cost from $3.54 to $0.63.
- Patent pending for the medical device.

Machine Learning Intern, Department of Energy Brookhaven National Lab, Upton, NY *Jul - Aug 2018*

- Wrote a data analysis program in Python to pinpoint and graphically visualize bottlenecks in Uber's distributed deep learning framework, Horovod.
- Analyzed the performance of the deep learning frameworks Apache MXNet and TensorFlow by running deep learning algorithms on the lab's supercomputer cluster.
- Co-authored a research paper that discussed methods to improve the performance and scalability of deep learning algorithms running on large GPU clusters. Paper accepted at the New York Scientific Data Summit.

Technical Projects

Hardware Projects

- Built a robot that used machine learning for facial detection (OpenCV) and speech processing (CMU PocketSphinx). Presented the robot at 4 elementary schools, resulting in a local news article.
- Assembled a remote-controlled robotic crab that walked using a series of Theo Jansen linkages.

Software Projects

- Trained a TensorFlow Transformer deep learning model on personal text messages to build a chatbot.
- Created a web application with ReactJS and Google Cloud machine learning where users could take pictures of their food to get its macronutrients. Won "Best Use of Google Cloud" at Hack Princeton 2019.

Leadership Experience

Computer-Aided Design Sub-Team Leader, Great Neck South FIRST Robotics Team *Sep 2015 - Jun 2019*

- Led a team of 5 students to design robot mechanisms with 3D computer models in Autodesk Inventor.
- Created an online summer course to teach Long Island high school students Computer-Aided Design.
- Won 3 regional competitions and competed at 3 international competitions.

Skills & Interests

Computer-Aided Design: Solidworks and Autodesk (Inventor, Fusion 360)
Programming: Python (TensorFlow, Flask), JavaScript (Node.js), C++ (Qt, Arduino), Java, C#, MATLAB
Cross Country Running: Captain of high school team
Volunteer Firefighting: Firefighter for the Manhasset-Lakeville Fire Department, NY State Firefighter I certified