Sima Mitra

Boston, MA 02111 | (774) 644-3691 | me@simamitra.com | www.simamitra.com

Motivated engineer with a diverse technical background ranging from algorithm development to PCB design. Passionate about tackling challenging problems and improving lives by developing cutting edge technologies.

SKILLS

Interests: Algorithm Development, Wearables, Optics, Computer Vision
Programming: MATLAB, Embedded C, C#, Python, Mathematica, Assembly, HTML, JQL
Technical: Circuit Design, PCB Layout, SMD soldering, OrCAD Designer, Test Equipment, OpenSCAD, Verilog

WORK EXPERIENCE

TemperatureAlert | Boston, MA | September 2015 – November 2016
Electrical Engineer

- Increased wireless pressure sensor battery life 6x by implementing successive back-off when sensor was unresponsive.
- Hardened the embedded C firmware to create a robust data uplink from sensors to central hub to server.
- Circuit design, layout, and assembly of rechargeable battery backup for WiFi product.
- PCB Layout for new -40°C tolerant BLE cold-chain monitoring product.
- Board design and firmware development for new Oxygen sensor.
- Designed an extensive automated firmware-testing platform in C#. The platform automatically programmed devices, interacted with debug ports, controlled sensors, and read LED blink patterns.
- Successful FCC/IC Certification of an OEM ZigBee module.
- Created a python tool that automatically diagnosed the cause of missing or late sensor readings by parsing device packets.

Quanttus, Inc. | Cambridge, MA | March 2014 – August 2015
R&D Engineer

- Developed pulse transit time algorithms in MATLAB to estimate blood pressure.
- Analyzed datasets to understand factors that affected biological signal morphology and quality.
- Evaluated electrocardiogram (ECG) and electrodermal activity (EDA) sensors on the wrist.
- Evaluated potential partner companies' photoplethysmography (PPG) sensors.
- Collaborated with the product development team to preserve signal quality during many prototype iterations.
- Defined test protocols and developed test rigs to evaluate PPG sensor performance.
- Researched optical properties of human skin to develop suitable human analogs for sensor testing.
- Wrote computer vision algorithms to automatically assess light output shape and intensity of different sensing elements.

EDUCATION

Masters of Engineering, Electrical and Computer Engineering, Cornell University, May 2013
Bachelors of Science, Electrical and Computer Engineering, Cornell University, May 2012

UNIVERSITY EXPERIENCE

Design of TicTocTrac, A Wristwatch that measures Time Perception (www.tictoctrac.com) – Team Project

- Created an Open Source LED wristwatch that enables a user to track their perception of time.
- Wrote embedded C firmware for the on board ATmega32U4 microcontroller.
- Designed custom PCBs incorporating a µc, RTC, USB, microSD, and vibe motor into a wearable form-factor.
- Featured on the Forbes, Hackaday, Makerbot, Adafruit, and Arduino Blogs.

Autonomous Quadcopter Docking System - Masters of Engineering Project

- Inexpensive open-source quadcopter controller using only easily available components and free software.
- Compensates for short battery life of UAVs by safely landing them in a designated recharging location.
- Wrote Python scripts to use computer vision from a live video stream to control the quadcopter.

Host and Embedded Software Design for Fab@Home 3D Printing Student Project Team

- Implemented core control commands on the MSP430 based motherboard of the next generation of the 3D printers.
- Wrote embedded system software in C and host software.

Nintendo Ninja - FPGA based hardware AI Design – Team Project

- Verilog AI on the Cyclone II FPGA that utilized computer vision to play World 1-1 of Super Mario Bros. on a NES.

Automatic Segmentation of *Tachycineta bicolor* – Team Project

- Designed a C computer vision algorithm that locates and segments the outline of an adult tree-swallow from videos.