Benjamin Coleman

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EDUCATION

Florida Atlantic University	Fall 2017
B.S. Electrical Engineering	Overall GPA: 3.99

SOFTWARE SKILLS

- Strong in C, C++, Python (4+ years)
- Competent in Swift (iOS), Java (Android), MatLab & Simulink (2 years)
- Familiar with Assembly (TI and PIC), Ruby, JavaScript, HTML
- Bash, git, SSH, GNU tools, powershell
- C++, Python profiling and optimization

HARDWARE SKILLS

- Analog: OrCAD PSPICE and Agilent ADS
- Digital: VHDL with Xilinx ISE & ISim
- SolidWorks (3D) and AutoCAD (2D)
- Magnetics simulation (COMSOL, FEMM)
- Altium and Eagle PCB design
- Oscilloscope, Spectrum Analyzer
- Laser cutting, 3D printing, reflow oven

EXPERIENCE

Research Assistant   **Asghar Nanotechnology Lab**   *Spring 2016 – Present*

- Designed a magnetic nanoparticle actuator (NanoMAP) used for HIV disease diagnosis
  - Designed and 3D printed components for stepper motor controller, designed PCB, wrote firmware in C, wrote control software in Python to interface multiple NanoMAPs over a serial connection
  - Designed microfluidic chips for an automated ELISA test for HIV
  - Resolved a problem where the magnetic particles would not move. The solution took 6 months and involved physics simulations and lab measurements of the magnetic field and magnetic moment
- Designed image processing algorithms for the evaluation of colorimetric tests using OpenCV
  - Wrote smartphone applications (iOS and Android) that determine absorbance and concentration of a biological sample from an image of the sample. (*Research presented at IEEE International Conference on Biomedical and Health Informatics 2017*)
  - Developed a novel physics model and processing algorithm for image-based concentration analysis that improves susceptibility to noise (*Currently in review with Sensors and Actuators B: Chemical*)
  - Developed a video analysis that improves the standard error of existing image methods (*In progress*)
- Designed a lensless CMOS microscope for large field-of-view holographic imaging (*In progress*)
  - Designed a lensless microscope around a CMOS camera, optical components, and 3D printing
  - Reconstructed of nanoscale objects from ultraviolet holograms using the angular spectrum method

Research Assistant Intern   **Aventusoft LLC**   *Summer 2017*

- Optimized a business-critical C++ algorithm for processing heart sounds of heart failure patients
- Achieved a speedup of 750% (1 hour to 8 minutes). This was done using:
  - C++ Profiling on Windows using Visual Studio sampling profiler, concurrency analysis
  - Multithreading with C++11, cache miss optimization, and heap profiling
- Deployed optimized C++ onto the Microsoft Azure cloud and was the Linux system administrator for the Ruby on Rails webserver. Wrote 30 pages of documentation for the cloud and C++.
- Acted as the point of contact for a web programming contractor. Prepared statements of work, negotiated design specifications, and designed the wireframes for 8 web pages
- Used spectrum analyzer to validate a new Bluetooth device. Helped recommend changes to enable the device to pass its FCC emissions tests. The recommendations were successful – the device passed.

AWARDS

- President's List & Engineering Dean's List (all 5/5 eligible semesters)
- 2016 Student Talon Award Finalist, 2015 Sunshine State Scholar Award
- 2017 Undergraduate Researcher of the Year
- 2017 FAU Wave Entrepreneurial Competition: 2nd Place