Cody G. Feltch

Software Engineer

Baltimore, MD · ###-###-####

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Summary

Software Engineer with an M.S. in Electrical and Computer Engineering, and experience in software design and development. Proficient in a variety of technology areas, including full-stack development, embedded systems, data collection systems, signal processing and machine learning. Experienced system architect and leader of small multi-disciplinary engineering teams.

Experience

Tanzen Medical

Baltimore, MD

Chief Technology Officer — *Sept. 2018 - Present*

- Invented an clinically accurate, wearable assessment device for movement sleep disorder using a unique multi-sensor solution
- Designed and programmed an embedded device using FreeRTOS on an ARM processor; included IMU, PPG, IR and Capacitive Sensors.
- Trained novel machine learners on leg movement data, to identify biomarkers of sleep disorder and disease.
- Lead the development of a wearable device, mobile application, web applications, SQL/NoSQL storage solutions and AWS integration.

Eccalon

Remote Work

Software Engineering Contractor — *June. 2021 - Present*

- Supported the development of FastStats, a Basketball ScoreKeeping and stat tracking platform built with React
- Developed the Project Spectrum cybersecurity resource website, with blog support and admin dashboard in Vue.js

University of Maryland Baltimore County

Baltimore, MD

Software Engineering Contractor — *July 2020 - Sept 2021*

- Developed the CyMOT Learning Management System (LMS) for hosting manufacturing related cybersecurity courseware.
- Created an implementation of the Moodle open-source LMS, customized front-end and built analytics plugins; hosted on AWS.
- Worked with MxD to develop a system for competency-based learning and progress tracking, based off of a cybersecurity skills taxonomy.

DCS Corp / Army Research Lab

Aberdeen Proving Grounds, MD

Software Engineer (Research Support for ARL Human Research & Engineering) — *Oct. 2014 - Sept. 2018*

- Collaborated with a multi-disciplinary team of scientists to design and implement data collection systems for psycho-physiology experiments.
- Developed desktop (Java, C, C++) and mobile (Android) applications for user interaction, experiment control, event tagging and data storage.
- Built a suite of Android apps and services for the logging, visualization and networking of data from Bluetooth sensors.
- Wrote data collection, cleaning and exploratory analysis code for physiology and event data, in Python and MATLAB.
- Developed a Python based platform for real-time data analysis and visualization prototyping.
- Created VR applications with Unity and SteamVR, including an interactive 3D brain displaying oscillatory activity from real-time EEG data.

Raytheon SAS

Aberdeen Proving Grounds, MD

Systems Software Engineer for Identification Friend or Foe (IFF) Systems — *Spring/Fall 2012, Aug. 2013 - Oct. 2014*

- Responsible for the development of system requirements, diagrams, and test set software for Identification Friend or Foe (IFF) systems.
- Wrote test set software to interface with GPIB and RS-232 devices and automate production testing.

Skills

Technology	Software Arcitechture, Database Design, Full-Stack Dev, Machine Learning, Signal Processing
Languages	Python, JavaScript, Java, C, C++, C#, MATLAB
Front End	Vue.js, React, HTML/CSS/JS, Bootstrap, EJS, Plotly
Back End	Node.js, Express, MongoDB, InfluxDB, AWS (EC2), Flask, NGINX, SQL
Other	Android, Unity, SteamVR, OpenCV, scikit-learn, Anaconda, Git, Jira, Scrum

Education

Johns Hopkins University (Engineering for Professionals Program)

Elkridge, MD

M.S. in Computer and Electrical Engineering (Honors) — *Part-Time, 2014-2017*

- Studied Computer Engineering concepts, Machine Learning, Robotics, Computer Vision and DSP.

York College of Pennsylvania

York, PA

B.S. in Electrical Engineering (Magna Cum Laude) — *2009 - 2013*

- Specialized in Digital and Analog Communication Systems, Radar Design and Control Theory.

Grants

NSF SBIR Phase I

Project ID: 1819626

In-home Monitoring of Sleep Fragmentation and Micro-Arousals by Characterizing Leg Movements *2018-2020*

- Principal Investigator (PI) for a $225k NSF grant focused on developing a novel sensing technology and analysis methods for monitoring leg movement data during sleep, and extraction of clinically relevant sleep metrics and bio-markers of disorder.

Publications

RestEaze: An Emerging Technology to Characterize Leg Movements During Sleep

ASME. J. Med. Devices

Brooks, J., Feltch, C., Lam, J., Earley, C., Robucci, R., Agarwal, S., and Banerjee, N. *Dec 6, 2021*

- Describes the functionality and scientific justification for the use of a multi-sensor wearable device to detect and monitor periodic leg movements during sleep (PLMS), sleep state and cortical arousal.

Automatic Nighttime Agitation and Sleep Disruption Detection Using a Wearable Ankle Device and Machine Learning

Sleep, Volume 43

R Kumar, C Feltch, K Richards, J Morrison, A Rangel, R Janney, S Shayesteh, R Allen, N Banerjee *May 27, 2020*

- Product of a collaboration with the University of Texas Austin, studying nighttime behavior in patients with Alzheimer's disease (AD) and applicability of automated detection of agitation behaviour.

Pilot Study: Can machine learning analyses of movement discriminate between leg movements in sleep (LMS) with vs. without cortical arousals?

Sleep and Breathing 25

A Jha, N Banerjee, C Feltch, et al. *May 26, 2020*

- Article detailing the preliminary research into a supervised learning approach for categorizing leg movements during sleep (LMS) associated with cortical micro-arousals, based on inertial and capacitive sensing data.