Cody G. Feltch

Software Engineer - Data Scientist - CTO

Baltimore, MD · ###-###-####

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Summary

Software Engineer with an M.S. in Electrical and Computer Engineering, and 9+ years of experience in software design and development. Proficient in a variety of technology areas, including full-stack development, data collection systems, embedded systems, signal processing, machine learning and Bluetooth low energy (BLE) implementations.

Experience

Tanzen Medical

Baltimore, MD

Chief Technology Officer — *Sept. 2018 - Present*

- Led the development of a clinically accurate, wearable assessment device for the diagnosis and treatment of sleep movement disorders.
- Designed an embedded device for the collection, storage and transmission of physiological sensor data (IMU, PPG, IR temperature) using an ARM based microcontroller with BLE and FreeRTOS.
- Created mobile and web applications to support the storage, visualization and analysis of patient data on the cloud.
- Trained novel machine learners to identify biomarkers of sleep disorder and disease from leg movement and physiology data.

Eccalon

Remote

Software Engineering Contractor — *June. 2021 - Present*

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

University of Maryland Baltimore County

Remote

Software Engineering Contractor — *July 2020 - Sept 2021*

- Launched the CyMOT Learning Management System (LMS) for hosting manufacturing related cybersecurity courseware.
- 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 and event tagging in studies.
- Built a suite of Android apps and services for the logging, visualization and networking of data from Bluetooth sensors.
- Wrote scripts for data collection, processing, exploration and visualisation of physiology and event data, in Python and MATLAB.
- Created VR applications with Unity and SteamVR, including an interactive 3D brain displaying oscillatory activity from real-time EEG data.
- Developed a platform for real-time data analysis and visualization prototyping.

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 requirements documents, system diagrams, system level test plans and test set software for Identification Friend or Foe (IFF) systems.

Skills

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

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

A pilot study to understand the relationship between cortical arousals and leg movements during sleep

Scientific Reports, 12

Bansal, K., Garcia, J., Feltch, C. et al. *July 25, 2022*

- 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.

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. *March 2, 2022*

- 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, 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.