

Cody G. Feltch

FREELANCE SOFTWARE ENGINEER & DATA SCIENTIST

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, machine learning and brain-computer interfaces. Experienced system architect and leader of small multi-disciplinary engineering teams.

Experience

Tanzen Medical

Baltimore, MD

CHIEF TECHNOLOGY OFFICER

Sept. 2018 - Present

- Invented an affordable, clinically accurate, sleep assessment device using a unique sensing solution; fusing inertial and capacitive measures.
- 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 integrations.
- Defined business models, built customer relationships and managed a team of talented engineers and scientists.

University of Maryland Baltimore County

Baltimore, MD

SOFTWARE ENGINEERING CONTRACTOR

July 2020 - Present

- Developed the CyMOT Learning Management System (LMS) for hosting manufacturing related cybersecurity courseware.
- Created an implementation of the Moodle open-source LMS, with custom front-end and analytic 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 and mobile applications for user interaction, experiment control, tagging and data storage.
- Built a suite of Android apps and services for the logging, visualization and networking of data from Bluetooth sensors.
- Created and implemented data communication schemas for IP and Bluetooth communication.
- Wrote data preparation, exploration and analysis code for physiology data and experimental events, in Python and MATLAB.
- Developed a Python based testbed 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.
- Designed custom sensing systems, including a posture sensor using an Arduino and arrays of force sensitive resistors.

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 C based test set software to interface with GPIB and RS-232 devices, for instrument control.
- Automated production testing for cost savings and to limit error from manual interaction.
- Modeled requirement in Rational Rhapsody for specifications and code generation.

Skills

Technology	Software Architecture, Database Design, Data Comms & Networking, Full-Stack Dev, Machine Learning, Signal Processing
Languages	Python, C, C++, Java, JavaScript, C#, MATLAB
Front End	Vue, HTML/CSS/JS, Bootstrap, EJS, Plotly
Back End	NodeJS, Express, MongoDB, InfluxDB, AWS (EC2), Flask, NGINX, SQL
Other	Android, Unity, SteamVR, OpenCV, scikit-learn, Anaconda, Git, SVN

Education

Johns Hopkins University (Engineering for Professionals Program)

Elkridge, MD

M.S. IN COMPUTER AND ELECTRICAL ENGINEERING (HONORS)

Part-Time, 2014-2017

- Studied Computer Science concepts, Machine Learning, Robotic Manipulation, 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

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 Breath (2020)

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.