Benjamin E. Shanahan

Class of 2017, Sc. B. in Neuroscience with Honors, Magna Cum Laude, Brown University
Class of 2013, Boston Latin School
Curriculum Vitae October 2022

Contact Information

Email	**benshanahan1 (at) gmail**
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Web	**benshanahan.dev** ***(projects & code)***

Technical Skills

Languages	C#, Python, JavaScript, TypeScript, Matlab, SQL, Bash
Web	Flask, ReactJS, Angular
Databases	PostgreSQL, MSSQL, Oracle
Misc	Docker, Helm, Kubernetes

Work Experience

2022 - Present | **Software Engineer II** | SpaceX, Hawthorne, CA

Worked on many systems: a distributed telemetry system used by Falcon and Dragon launches, an Enterprise Resource Planning software that runs the entire company, and a distributed microservice-based Manufacturing Execution System used by Starlink for high rate antenna dish and wireless router manufacturing. Wore many hats: software engineer, product manager, project manager. Understood manufacturing processes in the factory, met with stakeholders, scoped requirements, set and communicated timelines, designed, implemented, and supported software throughout SpaceX and Starlink. Improved team processes, documentation, and ability to share knowledge. Helped onboard and train new engineers. Most recently have joined the core telemetry team.
Managers: Kristine Huang

2020 - 2022 | **Software Engineer** | SpaceX, Hawthorne, CA

Managers (by recency): Tom Kiernan, Eric Lloyd, Anthony Rose, Steve Sepanloo

2018 - 2021 | **Research Software Engineer** | NeuroPace, Mountain View, CA

Full-stack design and development of internal web-based tools for research and field teams. Focus was on interfaces for analysis and interactive visualization of large neural data sets, collected by an implanted neurostimulator to help patients with epilepsy. Linux server and Oracle database administration and monitoring.
Manager: Tom Tcheng, Ph.D.

2017 - 2018 | **Computer Programmer** | BrainGate, Brown University, Providence, RI

Reverse-engineered and re-implemented software interface to neural recording software in C, allowing arbitrary data to be sent. Co-led architecture and implementation in C of BrainGate calibration/decoder pipeline on embedded Linux system. Wrote and ran testbenches in Vivado HLS to debug HLS signal processing code; wrote bash scripts to automate Xilinx system-on-chip build process. Led architecture and implementation of websocket-based message-passing system in Python for web-based real-time monitoring application; designed back-end database in MongoDB to store system status reports. Redesigned internal web portal application that is used to train newcomers to the lab. Supervised a high school intern in creation of JavaScript-based calibration game for the BrainGate system.
Supervisors: Dr. John Simeral & Dr. Leigh Hochberg

2016 - 2017	**Research Assistant**	BrainGate, Brown University, Providence, RI
	Implemented steady state Kalman filter in closed-loop auto-updating brain-computer interface (BCI) calibration system. Honors thesis research in idle state detection in BCIs in human motor and premotor cortex. Supervisors: Dr. Leigh Hochberg & Dr. David Brandman	
2015 - 2016	**Research Assistant**	Omarlab, Brown University, Providence, RI
	Analyzed shape of brain rhythms in running rats to evaluate their usefulness as an analytical metric. Work on figures and logic for first-author journal article. Developed Matlab toolbox for brain rhythm shape analysis. Shadowed epileptologist at Rhode Island Hospital. Supervisor: Dr. Omar Ahmed	
2014 - 2017	**Matlab Consultant**	Burwell Lab, Brown University, Providence, RI
	Develop and maintain Matlab code for colleagues' requested analyses and data processing. Tutor and assist colleagues in Matlab programming. Attend weekly lab meetings. Supervisor: Dr. Rebecca Burwell	
Summer 2014, 2013	**Research Assistant**	Cashlab, Massachusetts General Hosp., Boston, MA
	Developed affordable OpBox rat operant conditioning chamber with Dr. Eyal Kimchi. Developed Semiology Diagnostic Tool to objectively diagnose region of seizure onset and settle conflicts during surgical meetings. Developed Matlab toolbox to detect high-frequency oscillations in epilepsy data. Supervisors: Dr. Sydney Cash & Dr. Brandon Westover	
Summer 2012	**Tech Apprentice**	State Street Corp., Quincy, MA
	Summer intern in the Flexible Work Department. Documented, troubleshooted, maintained, & analyzed data from internal FlexTrax website. Designed and programmed time-saving macro for pulling reports in Visual Basic. Helped solve user issues, fix bugs, & document FlexTrax web tool. Manager: Chris Siclari	

Honors, Awards, & Grants

2018	**RISG Space Grant (*$1,000*) with team**	NASA Rhode Island Space Grant Consortium
2017	**Brown Design Workshop Maker Grant (*$500*) with team**	Brown University
2017	**Prize4Life ALS Hackathon winner (*$1,000 prize*)**	Prize4Life, Inc.
2017	**Sc. B. in Neuroscience with Honors, Magna Cum Laude**	Brown University
2015	**Matthew Siravo Undergraduate Award in Epilepsy**	Brown University
2013	**Campbell Medal**	Boston Latin School
2013	**T. Vincent Learson Scholarship**	Boston Latin School
2013	**Horace M. Chadsley '14 Scholarship**	Boston Latin School
2012	**National Honor Society**	Boston Latin School
2010-12	**Francis Gardner Prize for Excellence in Modern Studies**	Boston Latin School

Peer-Reviewed Publications

2020	EY Kimchi, BF Coughlin, **BE Shanahan**, G Piantoni, J Pezaris, SS Cash. *OpBox: Open source tools for simultaneous EEG and EMG acquisition from multiple subjects.* eNeuro.
2020	M Ghosh*, **BE Shanahan***, SC Furtak, GA Mashour, RD Burwell, OJ Ahmed. *Instantaneous amplitude and shape of postrhinal theta oscillations differentially encode running speed.* Behavioral Neuroscience.

2018	DM Brandman, T Hosman, J Saab, MC Burkhart, **BE Shanahan**, JG Ciancibello, AA Sarma, DJ Milstein, CE Vargas-Irwin, B Franco, J Kelemen, C Blabe, BA Murphy, DR Young, FR Willett, C Pandarinath, SD Stavisky, RF Kirsch, BL Walter, AB Ajiboye, SS Cash, EN Eskandar, JP Miller, JA Sweet, KV Shenoy, JM Henderson, B Jarosiewicz, MT Harrison, JD Simeral, and LR Hochberg. *Rapid calibration of an intracortical braincomputer interface for people with tetraplegia*. Journal of Neural Engineering.

Abstracts

2018	**Neural Interfaces Conference** Minneapolis, MN *A Mobile High-Performance Neural Processing Platform for Next-Generation High Channel-Count iBCIs*. C Heelan, **BE Shanahan**, DM Brandman, AN Dusang, JD Simeral, and AV Nurmikko.
2015	**Society for Neuroscience** Chicago *OpBox: Open-source development of customized and cost-effective hardware and software for behavioral neurophysiology*. BF Coughlin, **BE Shanahan**, G Piantoni, SS Cash, EY Kimchi.
2014	**American Epilepsy Society** Washington, DC *Human Single Neuron Correlates Of High Frequency Oscillations During Seizures*. OJ Ahmed, MA Kramer, JS Naftulin, **BE Shanahan**, EN Eskandar, R Cosgrove, NS Potter, A Blum, L Hochberg, SS Cash.

Presentations & Talks

2018	**NASA Rhode Island Space Grant Symposium** Providence, RI Gave brief talk with team at Rhode Island Space Grant Symposium about rocket flight computer development and motor-testing (see Projects below). Presentation can be found **here**.

Skills & Interests

Research	Organization and analysis of massive multi-day, multi-subject data sets.
Projects	Developed rocket flight computer with logging and rotational sensors to deploy a parachute at apogee. Developed an autonomous drone delivery service with integrated web-app. Developed real-time audio LED visualizer for making parties more exciting. Programmed web application for crowd-sourcing Spotify playlists among friends using Spotify Web API. Co-founded an ran an art-centric club at University for 2.5 years. More information and details on my website, **benshanahan.dev**.
Graphics	Proficient in Adobe Illustrator, Photoshop.
Language	Fluent in English; French conversational, reading, and writing skills; Spanish reading and writing skills; study of Latin
Personal	Highly organized, motivated, responsible, and resourceful. Team leader and collaborator. Perseverant and committed to projects. Creative and efficient problem solver. Not afraid to ask for help when necessary. Able to self-teach new concepts quickly and effectively.