

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

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Contact Information

Email	benshanahan1 (at) gmail
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Web	benshanahan.dev (<i>projects & code</i>)

Technical Skills

Languages	Python, Matlab, C, HTML5, CSS, JavaScript, SQL, Bash
Concepts	Object-oriented programming, RESTful API architecture/implementation/consumption
Frameworks	Flask
Libraries	ReactJS
Databases	PostgreSQL, Oracle, MongoDB
OS	Linux, Windows
Doc. Tools	Doxygen, Sphinx
Embedded	Zedboard, Raspberry Pi, Arduino

Work Experience

2018 - Present	Research Software Engineer NeuroPace, Mountain View, CA Full-stack development of internal web-based tools for research and field teams. Focus on interfaces for analysis and visualization of large neural data sets. Linux server and Oracle database administration and monitoring. Manager: Tom Tchong, 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. Redesign 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 - Present	Research Assistant 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	Omarlab, Brown University, Providence, RI
2014 - Present	Matlab Consultant 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	Burwell Lab, Brown University, Providence, RI
Summer 2014, 2013	Research Assistant 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	Cashlab, Massachusetts General Hosp., Boston, MA
Summer 2012	Tech Apprentice 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	State Street Corp., Quincy, MA

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

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. <i>Rapid calibration of an intracortical braincomputer interface for people with tetraplegia</i> . Journal of Neural Engineering.
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Abstracts

2018	Neural Interfaces Conference <i>A Mobile High-Performance Neural Processing Platform for Next-Generation High Channel-Count iBCIs.</i> Christopher Heelan, Benjamin E. Shanahan , David M. Brandman, Aliceson N. Dusang, John D. Simeral, and Arto V. Nurmikko	Minneapolis, MN
2015	Society for Neuroscience <i>OpBox: Open-source development of customized and cost-effective hardware and software for behavioral neurophysiology.</i> Brian F. Coughlin, Benjamin E. Shanahan , Giovanni Piantoni, Sydney S. Cash, Eyal Y. Kimchi.	Chicago
2014	American Epilepsy Society <i>Human Single Neuron Correlates Of High Frequency Oscillations During Seizures.</i> Omar J. Ahmed, Mark A. Kramer, Jason S. Naftulin, Benjamin Shanahan , Emad N. Eskandar, Rees Cosgrove, N. Stevenson Potter, Andrew Blum, Leigh Hochberg, Sydney S. Cash.	Washington, DC

Presentations & Talks

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