Julien A. Bloch

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Research Interests

Neural engineering, optogenetics, neuroplasticity, computational neuroscience, brain-computer interface, machine learning

Education

University of Washington, Seattle, Washington USA

Ph.D. Student, Bioengineering, expected graduation date: May 2023
Advisor: Azadeh Yazdan-Shahmorad

University of California Berkeley, Berkeley, California USA

B.A., Physics, December, 2017
B.A., Cognitive Science, December, 2017

Professional Experience

Machine Learning Intern, Elementum

Palo Alto, California USA — June 2018 - August 2018

Developed machine learning models for supply chain data analytics. Deployed models to production through Apache Spark compute clusters and AWS Sagemaker. Improved my skills in machine learning workflow and software production cycle.

Business Analyst Intern, Everwise

San Francisco, California USA — August 2013 - December 2013

Conducted market research, sales outreach, app prototyping, and business development planning. Reported directly to the CEO.

Research Experience

Graduate Research Assistant, Fetz Lab - UW Dept. of Physiology and Biophysics

Seattle, Washington USA — January 2019 - March 2019

Rotated under Professor Fetz under the supervision of Postdoc Irene Rembado. Ran non-human primate experiments consisting of cortical and vagal nerve electrical stimulation and recording, for the purpose of modulating neural plasticity.

Graduate Research Assistant, Yazdan Lab - UW Depts. of Bioengineering and ECE

Seattle, Washington USA — September 2018 - December 2018

Rotated under Professor Yazdan and completed data analysis for different datasets of optogenetic and electrical stimulation for neuroplasticity modulation. Research culminated in a conference paper that was submitted to IEEE EMBC 2019.

Undergraduate Research Assistant, Engineers for Exploration - UC San Diego Dept. of ECE

San Diego, California USA — June 2017 - August 2017

Researched at a NSF funded Research Experience for Undergrads (REU) in collaboration with UCSD, Scripps Institute of Oceanography, and National Geographic. Developed computer vision models to automatically classify land area from images obtained via drone and satellite. Improved my skills in machine learning, computer vision, and remote sensing.

Undergraduate Research Assistant, SwarmLab - UC Berkeley Dept. of EECS

Berkeley, California USA June 2015 - May 2017

Performed neural engineering research of acousto-optic waveuides for optical tissue penetration under the supervision of Professor Maysam Chamanzar (Carnegie Mellon), Professor Maharbiz (UC Berkeley), and Professor Alam (UC Berkeley). Improved my skills in circuit design, optics, and machining. The research culminated in a publication in *Nature Communications*.

Undergraduate Research Assistant, TAFLab - UC Berkeley Dept. of MechE

Berkeley, California USA August 2014 - December 2014

Performed quantum hydrodynamics research for Professor Reza Alam at the Theoretical and Applied Fluid Mechanics Lab. I conducted literature review and helped build parts of the experimental setup in a machine shop.

Honors and Awards

Graduate Education for Minorities Fellowship, 2018 - Present

UW College of Engineering Dean's Fellowship, 2018 - Present

Donald W. and Joan P. Baker Endowed Fellowship, 2018

UC Berkeley Dean's Honors, 2014

Publications

M. Chamanzar, M. Scopelliti, **J. Bloch**, et al., "Ultrasonic Sculpting of Virtual Optical Waveguides in Tissue," *Nature Communications*, Jan. 2019.

J. Bloch, K. Khateeb, D. Silversmith, et al., "Cortical Stimulation Induces Network-Wide Coherence Change Across Non-Human Primate Cortex," *Submitted, IEEE EMBC*.

Affiliations

Computational Neuroscience Center, Seattle, Washington USA, 2019 - Present

Center for Neurotechnology, Seattle, Washington USA, 2018 - Present

University of Washington Institute for Neuroengineering, Seattle, Washington USA, 2018 - Present

Washington National Primate Research Center, Seattle, Washington USA, 2018 - Present

Professional Memberships

Institute of Electrical and Electronics Engineers, 2019 - Present

Society for Neuroscience, 2018 - Present

Computer Skills

Programming Languages: Experienced with Python, Java, and Matlab. Proficient with Scheme, Swift, C, and R.

Machine Learning Skills: Experienced with machine learning algorithms, including computer vision algorithms and neural networks. Experienced with using these algorithms in Python primarily with Keras, Tensorflow, Sklearn and SparkML packages. Experienced with deploying models on PCs, cloud compute systems, and Spark clusters.

Software Skills: Experienced with Git, Photoshop, Illustrator, and all Microsoft Office products.

Extracurricular Activities

Member of Alpha Tau Omega Leadership Fraternity, 2014 - Present

Officer of Neurotech@Berkeley, 2016 - 2017

Volunteer with Berkeley Youth Engagement Advocacy and Housing Program, 2016 - 2017

Co-Founder and Officer of Berkeley Barbell Club, 2015 - 2016