

Research Interests

Translating neurotechnology from research lab to the home; partnering with patients as co-researchers for clinical R&D.

Education

- **PhD Candidate in Computer Science** | University of Washington, Expected Graduation August 2024
- **Master of Science in Computer Science** | University of Washington, 2022
- **Bachelor of Science in Computer Science** | Virginia Commonwealth University, 2019

Technical Skills

- **Languages** – Python, Java, Bash (expert), R, JavaScript (proficient), Perl, C, MATLAB (prior experience)
- **Tools** – Keras, Git, Apache Maven (expert), TensorFlow, Android developer, LaTeX (proficient), AWS, PyTorch (prior experience)

Research Experience

National Science Foundation Graduate Research Fellow

University of Washington | 2021-2024

- Engineered and deployed an at-home multimodal data collection platform ecosystem for optimizing adaptive deep brain stimulation (aDBS) therapy for Parkinson's disease.
- Remotely maintained the platform ecosystem for 2 years, collecting several hundred hours of data across modalities.
- Enabled remote monitoring of symptom severity by designing continuous assessments of movement quality from video and wearable-sensor data that significantly correlated with expert clinician ratings.
- Developed open-source software for infrastructuring a scalable platform ecosystem for deployment in multiple homes.
- Built a custom application to automatically initiate home video recordings based on a patient-approved schedule.
- Designed and conducted a post-study assessment to investigate the patient experience of participating in an at-home aDBS research study and conducting self-guided experiments for data collection.

Neuromodulation Research and Advanced Concepts Co-op

Boston Scientific | 2023

- Algorithm development and data analysis for guiding surgical implantation of Deep Brain Stimulation therapy.

Paul G. Allen School First-Year Ph.D. Fellow

University of Washington | 2019-2020

- Machine learning for decoding speech production and natural behaviours in human neural recordings.

Undergraduate Research Assistant

Virginia Commonwealth University | 2016-2019

- Developed tools for genomics-based classification problems and pattern recognition through deep neural networks and natural language processing.

Science Education Alliance Phage Hunters Advancing Genomics and Evolutionary Science (SEA-PHAGES)

Virginia Commonwealth University | 2015

- Isolated novel bacteriophage from soil samples, and annotated genomes for submission to GenBank.

Research Assistant

University of Virginia | 2014-2017

- Conducted hours of investigative research on large intellectual property and patent litigations and consults regarding problem solving and organization.

Publications

- Dixon, T., **Strandquist, G.**, Zeng, A., Frączek, T., Bechtold, R., Lawrence, D., ... & Little, S. (2024). Movement-responsive deep brain stimulation for Parkinson's Disease using a remotely optimized neural decoder. In submission.
- **Strandquist, G.**, Frączek, T., Dixon, T., Ravi, S., Bechtold, R., Lawrence, D., ... & Herron, J. (2023). Bringing the Clinic Home: An At-Home Multi-Modal Data Collection Ecosystem to Support Adaptive Deep Brain Stimulation. *Journal of visualized experiments: JoVE*, (197).
- **Strandquist, G.**, Dixon, T., Frączek, T., Ravi, S., Zeng, A., Bechtold, R., ... & Herron, J. (2023, April). In-Home Video and IMU Kinematics of Self Guided Tasks Correlate with Clinical Bradykinesia Scores. In *2023 11th International IEEE/EMBS Conference on Neural Engineering (NER)* (pp. 1-6). IEEE.
- Hart, B., Achakulvisut, T., Adeyemi, A., Akrami, A., Alicea, B., Alonso-Andres, A., ... & Vishne, G. (2022). Neuromatch Academy: a 3-week, online summer school in computational neuroscience. *Journal of Open Source Education*, 5(49), 118.
- Flounlacker, K., Miller, R., Marquez, D., & Johnson, A. (2017). Complete genome sequences of Bacillus phages DirtyBetty and Kida. *Genome Announcements*, 5(10), 10-1128.

Talks and Presentations

PhD Thesis Proposal: "Translating Neurotechnology to the Home Through Naturalistic Neural Decoding and Participatory Co-Design"

[Watch the talk](#)

University of Washington, February 2024

- Sharing my work in translating adaptive Deep Brain Stimulation therapy from research lab to the home, and proposing next steps to continue advancement of this work.

Guest Speaker: "Husky Brain Bytes Podcast: Interview with Gabrielle Strandquist"

[Listen to the episode](#)

CoNECT Husky Brain Bytes Podcast, November 2021

- Discussing my non-traditional path to a Computer Science PhD as a first-generation graduate student and working on machine learning solutions to analyze neural activity during everyday human behaviours.

Teaching and Outreach

Graduate Teaching Assistant | University of Washington, Spring and Summer 2024

- Facilitated student learning in a semi-flipped System & Software Tools class by providing in-class problem-solving assistance, conducting office hours, and monitoring online discussions.

[NeuroMatch Academy](#) Course Developer (NMA-CD).

- Developed course materials for [Week 2 Day 2](#) "Linear dynamical systems".
- Contributed to the design and creation of NMA teaching materials with tutorial design and Python implementation.

Writer for the [Center for Neurotechnology's Engage and Enable Blog](#).

- A series for aspiring engineers and scientists. [Part I](#) explores how scientific research works and [Part II](#) shares insights about the process.

Student Led Seminar Committee for [UW Computational Neuroscience Center](#).

- Started a neural engineering seminar series featuring junior faculty and post-docs, where speakers are selected by undergraduate and graduate students.

Digital Media Coordinator for the [Student Leadership Council](#) at the [Center for Neurotechnology](#).

- Content writing and social media engagement to promote research opportunities to students.

Conferences & Posters

- International Neuroethics Society, Baltimore MD: [Volitional BCI: Designing for agency in invasive brain computer interface](#), 2024.
- Computational Neuroscience Center's CoNectome Symposium, Seattle WA: Designing a Scoping Review: How is Participant Experience Discussed in BCI Studies?, 2024.
- 11th International IEEE/EMBS Conference on Neural Engineering, Baltimore MD, presented: [In-Home Video and IMU Kinematics of Self Guided Tasks Correlate with Clinical Bradykinesia Scores](#), 2023.
- Winner of the Dean's Undergraduate Research Symposium, 2nd place, Richmond VA, presented: [Species Classification Through Deep Learning](#), 2018.
- [Phage Lab Infographic](#), 2016.

Awards

- [National Science Foundation Graduate Research Fellow](#), 2021
- Paul G. Allen School Dean's First-Year Ph.D. Fellowship, 2019
- [Winner of the Dean's Undergraduate Research Symposium](#), 2nd place, VCU, 2018
- Dean's Undergraduate Research Initiative (DURI) Fellow, VCU, 2018
- Goldwater Scholarship Honourable Mention, 2017
- Phi Kappa Phi – Life Sciences Undergraduate Scholarship, 2017
- Dean's List, Virginia Commonwealth University, 2014 – 2019
- Academic Achievement Award NB, Virginia Commonwealth University, 2015 – 2019

Mentored Students

- **Zeynep Toprakhasti**, Bachelor of Science in Computer Science and Engineering
University of Washington | 2020 – 2023
- **Jazlin Taylor**, Master of Science in Electrical and Computer Engineering
University of Washington | 2024