Robert Tromm

bobby.tromm@gmail.com | +31 06 11153262 | Oxford, UK | American

EDUCATION

University of Oxford, Oxford, UK **March 2023 – September 2023**
MSc Research Studentship, Centre for Eudaimonia and Human Flourishing

Maastricht University, Maastricht, Netherlands **August 2021 – November 2023**
MSc Cognitive & Clinical Neuroscience

- **GPA:** 8.05/10
- **Relevant Coursework:** Advanced Statistics, Biomedical Brain Imaging, Electrophysiology, Introduction to R, Neuroanatomy

Brandeis University, Waltham, MA, USA **August 2016 - May 2020**
BS Neuroscience

- **Honors:** *Cum laude.*
- **GPA**: 3.5/4.0
- **Relevant Coursework:** Principles of Neuroscience, Computational Neuroscience, Data Structures & Algorithms, Data Analysis & Statistics, Philosophy of Mind, Neuroethics.

DIS: Danish Institute for Study Abroad, Copenhagen, Denmark **January 2019 - May 2019**
Study Abroad Program

SKILLS

- **Neuroscience:** Computational neuroscience, neuroimaging preprocessing, hypothesis testing, literature review, experimental design
- **Computational:** Whole-brain modeling, machine learning, clustering algorithms, signal processing, data science, statistical analysis, high-dimensional data analysis, Bayesian modeling & optimization, algorithms
- **Tools and Frameworks:** MATLAB, Python (scipy, numpy, nilearn, scikit-learn), Tensorflow, PyTorch, neuroimaging (FSL, SPM, FreeSurfer), R, SPSS, Bash, C++
- **Project Management:** Kanban, Gantt, Notion

HONORS & AWARDS

Usona Institute Scholarship, Usona Institute ($7,500 USD) **2024**
Polaris Fellowship, Entrepreneur First (£3,000 GBP) **2024**
Usona Institute Scholarship, Usona Institute ($7,500 USD) **2023**
Justice Brandeis Scholarship, Brandeis University ($70,000 USD) **2016 - 2020**
Alumni and Friends Grant, Brandeis University ($8,840 USD) **2016 - 2020**
AHEPA Scholarship, American Hellenic Educational Progressive Association ($1,750 USD) **2016**
Academic and Adversity Scholarship, Southern Alumni Scholarship Foundation ($1,750 USD) **2016**

RESEARCH EXPERIENCE

University of Minho, Braga, Portugal **November 2023 – Present**
Visiting Researcher, Laboratory of Dr. Joana Cabral

- Collaboration involving the analysis of repeated administration of ayahuasca in Santo Daime members on spontaneous switching between functional resting-state networks with Leading Eigenvector Dynamics Analysis (LEiDA).

University of Oxford, Oxford, UK **March 2023 – November 2023**

Visiting Researcher, Centre for Eudaimonia and Human Flourishing

- Collaborated with 8 professors and 2 PhD students from 7 international universities to analyze shifts in brain hierarchy due to chronic psychedelics and cannabis use using signal processing, ML algorithms, information theory, and graph theory.
- Analyzed and compared 3 fMRI datasets with Hopf bifurcation whole-brain modeling fit to functional connectivity and irreversibility, a measure of production entropy. The directed network, or effective connectivity, derived from whole-brain modeling allowed for graph-theoretic analysis of hierarchical organization through trophic coherence.

Maastricht University, Maastricht, Netherlands **June 2022 – March 2023**

Research Assistant, Laboratory of Dr. Jan Ramaekers

- Optimized a custom fMRI pre-processing pipeline using Docker, FastICA, MRIcron, and machine learning skull-stripping (HD-BET), improving performance by 50% and saving 2 hours of work time per dataset.
- Implemented binary masks, Butterworth filters, outlier detection, and robust functional connectivity (FC) techniques including PCA.

Imperial College London, London, England **February 2021 – February 2022**

Research Assistant, Centre for Psychedelic Research

- Transcribed post-psychedelic integration therapy session audio interviews for use in INSIGHT protocol studies under the supervision of Dr. Taylor Lyons.

Brandeis University, Waltham, MA, USA **June 2019 – May 2020**

Undergraduate Researcher, Laboratory of Prof. Eve Marder

- **Thesis topic:** Variability in homeostatic tuning rules produces diverse correlations in ion channels.
    - **Key finding**: Model neurons express variability in mRNA- and ion channel-level maximal conductance across neurons of the same cell type through differential regulation of ion channel associated mRNA transcription rates.
- Discovered that variation in ion channel receptor-coupled mRNA transcription rate increases robustness of homeostasis through expansion from 1 to 2-dimensional solution space.
- Constructed and analyzed 2 models of neuronal homeostasis in MATLAB and C++ with *Xolotl*.
- Implemented 2 homeostatic control mechanisms, derived from control theory and nonlinear dynamics, for use with *Xolotl*, improving performance by 3x versus the gold-standard simulator, NEURON.

PROFESSIONAL EXPERIENCE

Intercollegiate Psychedelics Network **August 2020 – September 2021**

Research & Professional Development Coordinator

- Worked on developing a mentorship pipeline for early-career students interested in psychedelic studies, entrepreneurship, and activism in the growing psychedelic space.
- Organized PsychedelX, a multidisciplinary seminar series for students interested in developing public speaking and presentation skills by giving seminars on psychedelic studies topics.

Novamind, Toronto, ON Canada **November 2020 – March 2021**

Statistician & Research Assistant, Laboratory of Dr. Adele Lafrance

- Collaborated with 3 neuroscientists and psychologists across industry and academia to advise on analytical methods for studying ketamine's role in treating eating disorders (ED).
- Assessed significant decreases in reliable change index (RCI) for 6 psychological measures (STAI, DERS-16, FAD-GFS, SCS, RSES, MADRS) post ketamine administration at 1-month follow-up.

PRESENTATIONS

Awareness Lectures on Psychedelic Science, Geneva, Switzerland **October 2023**

The Anarchically Organized Brain: Changes in Functional Hierarchical Organization after Acute and Chronic Use of Ayahuasca and DMT

- Presented on work during my MSc research studentship at the University of Oxford, involving information-theoretic analysis of whole-brain models simulating effective connectivity of psychedelic and cannabis administration.

SciFest IX Summer Symposium, Waltham, MA, USA **August 2019**

Dual homeostatic mechanisms can reproduce diverse ion channel correlations

- Presented a novel homeostatic pairing mechanism that effectively reproduced robust and diverse correlations between ion channels in model neurons.

PROJECTS

PsychedelX **February 2021**

Student-based talk competition for psychedelic studies and science

- In 2020, 30 undergraduate and graduate students were accepted into the competition. Judges for the final round of the competition included researchers Manoj Doss, Robin Carhart-Harris, Taylor Lyons, Eesmyal Santos-Braut, and Thomas Roberts.
- Led workshops on public speaking, presentation creation, research methods, and best practices for getting into both grad school and the psychedelic industry.
- Organized and moderated an industry Q&A panel for students interested in working in the psychedelic industry. Panelists discussed best practices for getting into the industry and personal experiences with their respective companies.

WORKSHOPS & CERTIFICATIONS

Mediterranean Society for the Study of Consciousness **March 2024**

Winter School

Neuromatch Academy **July 2020**

Computational Neuroscience Summer School