

Matthew Russell

WORK EXPERIENCE

BCI Researcher *Tufts HCI Lab & Microsoft Research* 2023 - Now

Conducted PhD research on the effects of Large Language Models on humans, including measures of the brain with fNIRS. Funded by and in collaboration with Microsoft Research.

PhD Candidate *Tufts HCI Lab* 2020 - Now

Designed, implemented, and analyzed human subject studies using fNIRS and EEG. Key research areas include differentiation of human states of workload and cross-task physiological states with low-cost EEG, and next-generation fNIRS-based interfaces to leverage index and recall of brain states.

Lecturer *Tufts University* 2020, 2023

Taught Data Structures in C++ in the Summers of 2020 and 2023.

Teaching Assistant *Tufts University* 2017 - Now

Assisted teaching courses on Human-Computer Interaction, Computer Graphics, Intro CS, Cybersecurity, Concurrency, and Data Structures. Designed and implemented, and currently maintain course CI/CD infrastructure and autograding frameworks in use by multiple courses at Tufts.

Research and Teaching Assistant *Syracuse University* 2015 - 2017

Developed research code for the Center for Autism Research in Electrophysiology (CARE) lab and taught programming fundamentals to PhD candidates in the lab..

Resident Monk *Dai Bosatsu Zendo, Rinzai Zen Monastery* 2011 - 2015

Lived and worked at the monastery. Responsibilities included: meditation and hatha yoga instructor (200-hour yoga certified), personal assistant to the Abbot (Inji), Zendo monitor who managed the rigorous structured meditation atmosphere during retreats (Jikijitsu), Monastery assistant who assisted retreatants with personal needs and lead work teams to maintain zendo cleanliness (Jisha).

Research/Teaching Assistant *Hamilton College* 2008 - 2011






Worked as a TA in fall/spring semesters; conducted human-subject research during the summers resulting in multiple publications.

EDUCATION

PhD Computer Science *Tufts University* 2020 - Now

MS Computer Science *Tufts University* 2017 - 2020

BA Computer Science, English Literature *Hamilton College* 2007 - 2011

 github.com/matrussell2
 mrussell.me
 mrussell@cs.tufts.edu
 (315) 510-9089
 Medford, MA

RESEARCH SKILLS

Can design, implement, run, analyze, and write human subject studies, including studies leveraging brain-sensing (EEG/fNIRS) or other physiological sensors (Empatica, etc.), as well as studies which leverage human-state data to adapt real-time interfaces.

COMMUNICATION AND TEAMWORK

Am a team-first collaborator and highly skilled communicator. Able to distill complex ideas succinctly to people across a wide range of skill levels. I thrive in open-minded environments where constructive criticism is the norm.

TECHNICAL COMPETENCE

Am highly technically skilled. Very proficient in Python, R, C++, Bash, git, CI/CD Pipelines, Docker, web development, and cloud deployments. Capable of learning any new language or framework quickly.

PROCESS OPTIMIZATION

Skilled in analyzing complex systems and interfaces, identifying bottlenecks, and implementing solutions to streamline processes and improve. Passionate about identifying and solving systemic problems that hinder operational efficiency or user experience.

PUBLICATIONS

- M. Russell**, A. Shah, G. Blaney, J. Amores, A. Cambon, M. Czerwinski, R.J.K Jacob, "Your Brain on an Interactive LLM" *[in review]* (2024).
- M. Russell**, S. Youkeles, A. Shah, E. Lai, R.J.K. Jacob, "Chess, Cognitive Neuroscience, and their Interaction with the MUSE 2 device for BCI" *[in review]* (2024).
- M. Russell**, S. Hincks, L. Wang, A. Babar, Z. Chen, Z. White, R.J.K Jacob, "Visualization and Workload with Implicit fNIRS-based BCI" *[accepted]* (2024).
- A. Bosworth, **M. Russell**, and R.J.K Jacob, "fNIRS as an Input to Brain Computer Interfaces: A Review of Research from the Tufts Human Computer Interaction Laboratory," *Photonics* (2019).
- T. Shibata, A. Borisenko, A. Hakone, T. August, L. Deligiannidis, C.H. Yu, **M. Russell**, A. Olwal, and R.J.K. Jacob, "An Implicit Dialogue Injection System for Interruption Management," *Proc. Tenth Augmented Human International Conference* (2019).
- L. Hirshfield, D. Bergen-Cico, M. Costa, R.J.K. Jacob, S. Hincks, **M. Russell**, "Measuring the Neural Correlates of Mindfulness with Functional Near-Infrared Spectroscopy," *Empirical Studies of Contemplative Practices* (2018).
- L. Hirshfield, R. Gulotta, S. Hirshfield, S. Hincks, **M. Russell**, R. Ward, T. Williams, and R. Jacob, "This is Your Brain on Interfaces: Enhancing Usability Testing with Functional Near-Infrared Spectroscopy," *Proc. ACM CHI 2011 Human Factors in Computing Systems Conference*, ACM Press (2011).
- L. Hirshfield, S. Hirshfield, S. Hincks, **M. Russell**, R. Ward, T. Williams, "Trust in Human-Computer Interactions as Measured by Frustration, Surprise, and Workload.," *Foundations of Augmented Cognition. Directing the Future of Adaptive Systems*. (2011).

PROJECTS

- Gradescope Autograder** — Course CI/CD Infrastructure and C++ autograding framework. <https://rb.gy/t9r14h>
- unit_test** — VSCode Extension for unit-testing C++ code. <https://rb.gy/tex0so>