Paxton Fitzpatrick

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EDUCATION

Dartmouth College, Hanover, NH **2021 – present**
PhD student, Cognitive Neuroscience
Advisors: Jeremy R. Manning, Ph.D. & Luke J. Chang, Ph.D.

Dartmouth College, Hanover, NH **2015 – 2019**
B.A., Neuroscience with Honors
Honors Thesis: Capturing the evolving geometric and neural structures of experiences and memories

RESEARCH EXPERIENCE

Contextual Dynamics Lab, Hanover, NH **March 2017 – Sept. 2021**
Laboratory & Research Manager *June 2018 – Sept. 2021*
Research Assistant *March 2017 – June 2018*
PI: Jeremy R. Manning, Ph.D.

Dartmouth Brain Imaging Center, Hanover, NH **Sept. 2016 – June 2019**
Research Assistant
PI: James V. Haxby, Ph.D.

Bregman Media Labs, Hanover, NH **March 2017 – July 2017**
Research Assistant
PI: Michael A. Casey, Ph.D.

PUBLICATIONS & PRESENTATIONS

Manuscripts

Fitzpatrick, P. C., Manning, J. R. (2022). Davos: The Python package smuggler. (*under revision*).

Manning J. R., Notaro G. M., Chen E., **Fitzpatrick P. C.** (2022). Fitness tracking reveals task-specific associations between memory, mental health, and exercise. (*under revision*).

Heusser A. C.[†], **Fitzpatrick P. C.**[†], Manning J. R. (2021). Geometric models reveal behavioural and neural signatures of transforming experiences into memories. *Nature Human Behaviour*. doi:10.1038/s41562-021-01051-6.

Ziman K., Heusser A. C., **Fitzpatrick P. C.**, Field C. E., Manning J. R. (2018). Is automatic speech-to-text transcription ready for use in psychological experiments?. *Behavior research methods*, 1-9.

[†]Denotes equal contribution

Heusser A. C., **Fitzpatrick P. C.**, Field C. E., Ziman K., Manning J. R. (2017). Quail: a Python toolbox for analyzing and plotting free recall data. *The Journal of Open Source Software*, 2(18): 424.

Talks

Fitzpatrick P. C. (2022). Capturing the geometric and neural structures of experiences and memories. *Dartmouth College*. Hanover, NH.

Fitzpatrick P. C., O'Nell, K. C. (2022). Connecting fragmented networks of neuroscientific research via bibliometric analysis. *Dartmouth College*. Hanover, NH.

Fitzpatrick P. C. (2021). Docker for scientific research. *Dartmouth College*. Hanover, NH.

Fitzpatrick P. C. (2020). Web-based behavioral experiments for online data collection. *EPSCoR Attention Consortium meeting*, (virtual).

Abstracts & Poster Presentations

Jain S., Schreder N., **Fitzpatrick P. C.**, Ziman K., Manning J. R. (2022). Cognitive Markers of Mental Health. *Wetterhahn Science Symposium*. Hanover, NH.

Fitzpatrick P. C., Heusser, A. C., Manning J. R. (2022). A geometric approach to modeling knowledge and learning from Khan Academy course videos. *Context and Episodic Memory Symposium*. Philadelphia, PA.

Jain S., Schreder N., **Fitzpatrick P. C.**, Ziman K., Manning J. R. (2021). Cognitive tasks as a diagnostic tool for mental health. *Trends in Psychology Summit*. Cambridge, MA.

Fitzpatrick P. C., Heusser A. C., Manning J. R. (2019). Exploring the evolving geometric structure of experiences and memories. *Society for Neuroscience Annual Meeting*. Chicago, IL.

Fitzpatrick P. C., Heusser A. C., Manning J. R. (2019). Capturing the evolving geometric and neural structures of experiences and memories. *Wetterhahn Science Symposium*. Hanover, NH.

Fitzpatrick P. C., Heusser A. C., Manning J. R. (2018). Mapping between naturalistic experience and verbal recall. *Society for Neuroscience Annual Meeting*. San Diego, CA.

Heusser A. C., **Fitzpatrick P. C.**, Manning J. R. (2018). Capturing the geometric structure of our experiences and how we remember them. *Conference on Cognitive Computational Neuroscience*. Philadelphia, PA.

Fitzpatrick P. C., Ziman, K., Heusser, A. C., Field, C. E., Manning, J. R. (2018). The utility of speech-to-text software for transcription of verbal response data. *Wetterhahn Science Symposium*. Hanover, NH.

Lee M., Chacko R., Whitaker E., **Fitzpatrick P. C.**, Field C. E., Ziman K., Bollinger B., Heusser A. C., Manning J. R. (2018). Adaptive free recall: Enhancing (or diminishing) memory. *Wetterhahn Science Symposium*. Hanover, NH.

Ziman K., Heusser A. C., **Fitzpatrick P. C.**, Field C. E., Manning J. R. (2018). Is automatic speech-to-text transcription ready for use in psychological experiments?. *Context and Episodic Memory Symposium*. Philadelphia, PA.

OPEN-SOURCE SOFTWARE

Original software

Fitzpatrick P. C., Manning J. R. (2021). Davos: The Python package smuggler. GitHub.

Fitzpatrick P. C. (2021). Docker Tutorials: Pre-built Docker images and walkthroughs for online experiment deployment and data analyses. GitHub.

Fitzpatrick P. C. (2021). PsiTurk Experiment Template: A template behavioral experiment ready to be deployed locally or on Amazon Mechanical Turk. GitHub.

Fitzpatrick P. C. (2021). particle-image: animate a particlized image in vanilla JavaScript. GitHub.

Manning, J. R., **Fitzpatrick, P. C.** (2020). Hierarchical Topographic Factor Analysis with Brainiak (tutorial). GitHub.

Fitzpatrick P. C. (2020). CDL Docker Stacks: Lightweight, customizable, hierarchically built Docker images for common neuro/data science applications. GitHub.

Fitzpatrick P. C. (2020). GitTracker: a Python application for simultaneously tracking the many local git repositories. GitHub.

Heusser A. C., Ziman K., **Fitzpatrick P. C.**, Field C. E., Manning J. R. (2017) AutoFR: a scalable verbal free recall experiment with automatic speech-to-text transcription. GitHub.

Heusser A. C., **Fitzpatrick P. C.**, Field C. E., Ziman K., Manning J. R. (2017) Quail: a Python toolbox for analyzing and plotting free recall data. GitHub.

Other open-source contributions (selected)

Lead maintainer, Hypertools: A Python toolbox for gaining insights into high-dimensional data **2019 – present**

Core maintainer, UMAP: Uniform Approximation and Projection **2019 – present**

Core contributor, Timecorr: Estimate dynamic high-order correlations in multivariate timeseries data **2018 – 2021**

Core contributor, SuperEEG: Infer activity throughout the brain from a small(ish) number of electrodes using Gaussian process regression **2020**

AWARDS & HONORS

Neukom Institute Travel Grant **April 2022**

Methods in Neuroscience at Dartmouth (MIND) attendee **July 2019**

Lt. William Brewster Nickerson 1964 Psychology and Brain Sciences Prize **May 2019**

Robert N. Leaton Prize for Best Neuroscience Thesis **May 2019**

Sigma Xi Scientific Research Honors Society, Associate Member **May 2019**

Dartmouth Academic Skills Center Tutor Spotlight award **March 2019**

Undergraduate Research Senior Conference Grant award **August 2018**

Citation for Meritorious Performance – Systems Neuroscience with Laboratory **May 2018**

TEACHING & MENTORSHIP

TA, Laboratory in Experimental Psychology **Spring 2022**

TA & Guest Lecturer, Intro to Programming for Psychological Scientists **Winter 2021**
Guest lecture unit: "ELIZA: Programming a non-directive therapist"

TA, Storytelling with Data **Spring 2020**

TA, Intro to Programming for Psychological Scientists **Winter 2020**

TA, Human Memory **Fall 2019**

Peer Tutor, Intro to Programming and Computation **Spring 2019**

Peer Tutor, Intro to Programming and Computation **Winter 2019**

Peer Tutor, Intro to Programming and Computation **Fall 2018**

Undergraduate research mentees
Darren Gu, William Baxley, Shane Park, Chelsea Uddenberg, Esme Chen, Tehut Biru, Swestha Jain

PROFESSIONAL ACTIVITIES & SERVICE

Ad hoc reviewerships

The Journal of Open Source Software **2020**

Workshops & Events

The Meditating Brain: Neuroscience & Meditation Workshop **Sept. 2018**
Co-facilitator

Exnectome: Brainwave Sonification Musical Ensemble **Feb. 2017 – May 2017**
Co-creator & performer

Paint Your Brain: An Interactive EEG-driven Sonic Art Exhibit **May 2017**
Co-creator & organizer

Service

Upper Valley Land Trust – Social Impact Practicum **March 2019 – June 2019**
Data Analyst & Presenter

Hartford Autism Regional Program – Social Impact Practicum **Jan. 2019 – April 2019**
Data Analyst & Presenter

Oxfam America, Dartmouth College Chapter **Sept. 2016 – Sept. 2018**
President & Co-founder