CHRISTOPHER HAMBLIN

40 Dundee Rd Arlington, MA 02476

781-572-6159 ◇ chrishamblin@fas.harvard.edu ◇ github.com/chrishamblin7 ◇ **www.chrishamblin.xyz**

EDUCATION

Harvard University – ***Cambridge MA*** September 2019 - May 2024
PhD Psychology GPA 4.0/4.0
Advisor George Alvarez, Vision Sciences Lab
Thesis Committee: Talia Konkle, Martin Wattenberg, and Thomas Serre

Tufts University – ***Medford MA*** September 2011 - May 2015
Bachelors of Science in Mathematics and Philosophy GPA 3.7/4.0
Magna Cum Laude
Highest Honors Thesis for *The Phenomenology of Bayesian Predictive Coding*

RESEARCH EXPERIENCE

Harvard Vision Sciences Lab – ***Cambridge MA*** Sep 2019 - Present
PhD Candidate

- Broadly, researched methods for 'reading out' latent algorithms in deep-learned computer vision models.
- Developed novel techniques for feature visualization and attribution with saliency maps in discriminative models.
- Leverage pruning methods to decompose networks into modular sub-functions (circuits).
- Developed software tools for the fast, intuitive exploration of the latent representations and circuits in computer vision models.
- Led modeling efforts on projects comparing the representational geometry of the neural network embedding space for images to those inferred from psycho-physical and fMRI data.

Stanford Cognitive Systems Neuroscience Lab – ***Palo Alto CA*** May 2017 - Present
Computational Research Assistant

- Updated/maintained in house lab data processing pipeline and data structures for use with high performance cluster, Google cloud services, and docker containers.
- Standardization, cleaning, and anonymization of 20 years of collected fMRI, EEG, and behavioral data.
- Design and coding of all lab's task-based fMRI experiment stimuli and neuropsychological assessments.
- Launch and maintain web server collecting data from novel assessments for quickly diagnosing mathematical learning disability in children.
- Database management for lab's custom participant database.
- Linux administration and IT support for all lab members.

OTHER WORK EXPERIENCE

Harvard College – ***Cambridge, MA*** September 2021 - May 2023
Teaching Fellow

- ***Game Theory and Human Behavior:*** Taught 4 sections and graded papers for course on game theory's influence on social science. Developed own curriculum based on live game playing. *(1 semester)*
- ***Introduction to Statistics for Behavioral Sciences:*** Taught 2 sections on classical statistical tests using R.*(2 semesters)*
- High student ratings resulted in teaching award for all semesters taught.

STEM CAMP – ***Medford, MA*** July 2013 - August 2015
Founder/Head Teacher - Engineering Summer Camp

- Co-founded and taught three 8-week summer camps for middle-schoolers covering a wide range of hands-on engineering projects.
- Wrote and implemented 450 hours of STEM curriculum.
- Projects included rocket gilders, model airplanes, AM radios, electric motors, speakers, robotics with LEGO mind-storms, put-put boats, harmonographs, Rube Goldberg machines, musical instrument design, kinetic sculpture etc.

The Piano Van – ***New Zealand*** October 2015 - May 2017
Self Employed – Pianist

- Converted cargo vans into campers with custom system for transporting a piano.
- Traveled across New Zealand and the United States as a street pianist, piano tuner, and technician.
- Keyboardist for *American Symphony of Soul* – Sound of Boston Album of the Year 2016

TECHNICAL SKILLS

Scripting Languages	Python, MATLAB, R, JavaScript,
Software & Tools	Pytorch, LaTeX, Github, SQL, Mongo, Blender, HTML+css, AWS, SLURM

PUBLICATIONS

Hamblin C & Konkle T. & Alvarez G. Understanding Inhibition with Maximally Tense Images. *(In prep NEURIPS 2024)*

Hamblin C & Konkle T. & Alvarez G. Optimizing for possible feature combinations in discriminative vision models. *(Computational Cognitive Neuroscience Conference 2024)*

Prince J. & Park J. &
Hamblin C & Alvarez G. & Konkle T. Dissecting visual population codes with brain-guided feature accentuation. *(Computational Cognitive Neuroscience Conference 2024)*

Hamblin C & Konkle T. & Alvarez G. Feature Accentuation: Revealing "What" Features Respond to in Natural Images (2024) *arXiv preprint arXiv:2206.01627 (In prep NEURIPS 2024)*

Conwell C, Prince J, **Hamblin C** & Alvarez G. Controlled assessment of CLIP-style language-aligned vision models in prediction of brain & behavioral data (2023) *ME-FoMo workshop @ ICLR*

Hamblin C, Konkle T. & Alvarez G. Pruning for interpretable circuits in CNNs (2022) *arXiv preprint arXiv:2206.01627*

Conwell C & **Hamblin C**. Towards Disentangling the Roles of Vision & Language in Aesthetic Experience with Multimodal DNNs (2022)*SVRHM Workshop @ NeurIPS*

Janini D, **Hamblin C**, Deza A, & Konkle T. General object-based features account for letter perception (2022) *PLOS Computational Biology*

TALKS & POSTERS

Hamblin C & Konkle T. & Alvarez G. Diverse visual feature selectivity is enabled through inhibitory feature surrounds in deep neural network models *(Vision Science Society 2024)*

Hamblin C & Konkle T. & Alvarez G. Uncovering the hidden computations of deep neural networks by tracing the trajectory manifold from images to feature activations *(Vision Science Society 2023)*

Hamblin C & Konkle T. & Alvarez G. Understanding the Invariances of Visual Features with Separable Subnetworks *(Vision Science Society 2022)* (talk)

Hamblin C & Alvarez G. VISCNN: A Tool for Visualizing Interpretable Subgraphs in CNNs *(Vision Science Society 2021)*