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Curriculum Vitae

Charlie S. Burlingham

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EDUCATION

Ph.D. (Experimental Psychology), New York University, 2023 (expected)
Advisor: David Heeger
M.Phil. (Experimental Psychology), New York University, 2020
B.H.A. (Cognitive Neuroscience & Art) with Honors, Carnegie Mellon University, 2015
Advisor: Marlene Behrmann
Affiliate Student (Psychology), University College London, 2014

PUBLICATIONS

- **Burlingham, C.***, Mirbagheri, S.*, & Heeger, D. (2022). A unified model of the task-evoked pupil response. *Science Advances*. *In press*. *equal contribution.
- **Burlingham, C**., Ryoo, M., Roth, Z. N., Mirbagheri, S., Heeger, D., & Merriam, E. (2022). Task-related hemodynamic responses in human early visual cortex are modulated by task difficulty and behavioral performance. *eLife, 11,* https://doi.org/10.7554/eLife.73018
- **Burlingham, C.** & Heeger, D. (2020). Heading perception depends on time-varying evolution of optic flow. *Proceedings of the National Academy of Sciences,* 117 (50), https://doi.org/10.1073/pnas.2022984117
- Granovetter, M., **Burlingham, C.**, Blauch, N., Minshew, N., Heeger, D., & Behrmann, M. (2020). Uncharacteristic task-evoked pupillary responses implicate atypical locus coeruleus activity in autism. *Journal of Neuroscience,* 40(19), 3815-3826.
- Gabay, S., **Burlingham, C.**, & Behrmann, M. (2014). The nature of face representations in subcortical regions. *Neuropsychologia,* 59, 35-46.

PREPRINTS

MANUSCRIPTS IN PREPARATION

- **Burlingham, C.**, Hua, M., Xu, O., Bonnen, K., & Heeger, D. Heading perception and the structure of the optic acceleration field.
- Szpiro, S.*, **Burlingham, C.***, Simoncelli, E., & Carrasco, M., Perceptual learning improves

discrimination while distorting appearance. *equal contribution.

AWARDS & FUNDING

- Coons/Leibowitz Award for Best Graduate Student Teaching, NYU, 2021
- Dean's Dissertation Writing Fellowship, NYU, 2021-2022
- National Defense Science and Engineering Graduate Fellowship, 2018-2021
- Visual Neuroscience Training Grant, NEI T32, EY007136*,* NYU, 2017
- GSAS Dean's Student Travel Grant, NYU, 2017 & 2022
- Phi Beta Kappa, CMU, 2015
- Department of Psychology Research Methods Best Poster Award, CMU, 2015
- Small Undergraduate Research Grant, CMU, 2014
- Summer Undergraduate Research Fellowship, CMU, 2013
- C.G. Douglas "Wrong Way" Corrigan Summer Travel Fellowship, CMU, 2012
- Regina Gouger Miller Scholarship, CMU, 2011

CONFERENCE PARTICIPATION

Talks

- **Burlingham, C.**, Mirbagheri, S., Roth, Z. N., Heeger, D., & Merriam, E. (2022, May). *Task-related activity in visual cortex*. Part of the symposium "Beyond representation and attention: Cognitive modulations of activity in visual cortex." Vision Sciences Society, St. Pete's Beach, Florida, US.

Posters

- Mirbagheri, S., **Burlingham, C.,** & Heeger, D., (2021, November). *A unified model of the task-evoked pupil response.* Society for Neuroscience.
- **Burlingham, C.**, Mirbagheri, S., & Heeger, D., (2021, July). *A unified model of the task-evoked pupil response.* Annual NDSEG Conference: Sharing the vision, Discovering Solutions, Advancing with DoD.
- **Burlingham, C.**, Mirbagheri, S., & Heeger, D., (2021, May). *Saccades and pupil size are driven by a common arousal-related input.* Vision Sciences Society.
- Granovetter, M., **Burlingham, C.**, Heeger, D., & Behrmann, M. (2019, May). *Modulation of Task-Evoked Pupil Dilations Differs in Individuals with Autism Spectrum Disorders: Implications for Noradrenergic and Cholinergic Dysfunction in ASD.* The International Society for Autism Research, Montreal, Canada.
- **Burlingham, C.** & Heeger, D. (2018, May). *Heading Perception Depends on Time-Varying*

Evolution of Optic Flow. Vision Sciences Society, St. Pete's Beach, Florida, US.

- Ryoo, M., **Burlingham, C.**, Merriam, E., Roth, Z. N., Heeger, D. (2018, May). *A widespread task-related hemodyamic response in human V1 is modulated by task difficulty.* Vision Sciences Society, St. Pete's Beach, Florida, US.
- Mirbagheri, S., **Burlingham, C.**, Heeger, D., Merriam, E. (2018, April). *The Effect of Task Difficulty on Pupillary Response.* NYU MA Psychology Research Conference. NYU, New York, NY.

OTHER TALKS

- **Burlingham, C.** & Heeger, D. (2017, September). *Heading Perception Depends on Time-Varying Evolution of Optic Flow.* Cognition & Perception Miniconvention, NYU, New York, NY.
- **Burlingham, C.**, Ryoo, M., Mirbagheri, S., Roth, Z. N., Heeger, D., & Merriam, E. (2018, September). *Task-related hemodynamic responses in human visual cortex are linked to arousal.* Cognition & Perception Miniconvention, NYU, New York, NY.

TEACHING EXPERIENCE

Undergraduate

- *Perception,* NYU — Instructor of Record, Summer 2020
  Small interactive course (30 students) on the perceptual psychology and sensory neuroscience of vision, audition, touch, olfaction, gustation, and vestibular function.
- *Perception,* NYU — T.A., Spring 2020
  Large traditional-style course (120 students) on the perceptual psychology of vision, audition, touch, and vestibular function. With Larry Maloney.
- *Computational Neuroscience,* NYU — Guest teacher, Fall 2018
  Small programming/math problem-set-based undergraduate course. I led two sessions of the class through participatory programming exercises in the instructor's absence. With David Heeger.

Graduate

- *Perception*, NYU — T.A., Spring 2021
  Doctoral core course in perceptual psychology. With David Heeger.
- *Math Tools for Neural and Cognitive Science*, NYU — T.A., Fall 2016
  First year doctoral math & programming course. With Eero Simoncelli, Mike Landy, and Pascal Wallisch.

High School

- *BrainWaves,* City-As School — Co-Teacher, Spring 2017
  EEG-based high school neuroscience course & outreach effort. With Ido Davidesco and Tamara Parks.

MENTORSHIP

Graduate (Masters)

- Saghar Mirbagheri (Psychology, NYU), Spring 2018 – Summer 2020
  Thesis: *A linear model explains arousal-related pupil dynamics during task and rest.*

Undergraduate

- Benjamin Jenney (CS, Columbia University), Summer 2021 – Present
  Do stereopsis, a large field of view, and instantaneous optic flow suffice for accurate heading perception?
- Mengjian Hua (Math, NYU), Spring 2020 – Present
  Heading perception and the structure of the optic acceleration field.
  Mentored through the Training Program in Computational Neuroscience at NYU.
- Oliver Xu (Math & CS, NYU), Spring 2020 – Present
  Heading perception and the structure of the optic acceleration field.
- Jonathan Trattner **(**Neuroscience, Wake Forest University), Summer 2019
  Heading perception with real and simulated head rotations.
  Mentored through the Summer Undergraduate Research Program at the Center for Neural Science at NYU.

SERVICE

- Mentor, *2020 NYU Psychology Virtual Research Internship* (a diversity and inclusion effort for prospective PhD students), Summer 2020
- Ad Hoc Reviewer - *Journal of Vision*

ADDITIONAL TRAINING

- Preparing Future Faculty: Achieving Success through Communication (one semester course on theory and practice of university-level teaching), NYU, 2021
- Advanced Science Communication Workshop (one semester), Arthur L. Carter Journalism Institute, NYU, 2020

- Science Communication Workshop (one semester), Arthur L. Carter Journalism Institute, NYU, 2018
- Computational Neuroscience: Vision Summer Course, Cold Spring Harbor Laboratory, 2018
- Center for Vision Research (CVR) Vision Science Summer School, York University, 2015
- MATLAB Minicourse, CMU, 2013
- UNIX Shell Scripting Workshop, CMU, 2015

PROFESSIONAL EXPERIENCE

- Source code analyst, *Syte v. Slyce (*AI-driven visual search startups), Summer 2020

LANGUAGES

English (native), **French** (conversational)

PROGRAMMING LANGUAGES

MATLAB, Python, R, Bash

SOFTWARE

PsychToolBox, MGL, mrTools, PyTorch, DSI Studio, Adobe Creative Suite, LaTeX

REFERENCES

David Heeger
Julius Silver Professor, Professor of Psychology and Neural Science
New York University
heeger@nyu.edu

Eero Simoncelli
Julius Silver Professor; Professor of Neural Science, Mathematics, Data Science and Psychology
New York University
eps2@nyu.edu

Mike Landy
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Marlene Behrmann

April 8, 2022

Thomas Stockham Baker University Professor of Cognitive Neuroscience
Carnegie Mellon University
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