

# EIVINAS BUTKUS

PhD Student in Psychology at Columbia University, supervised by Niko Kriegeskorte.

Studying how resource constraints—limitations on space, time, energy and data—shape natural and artificial intelligence, and how brains and machines build internal models of the world.

email: [eivinas.butkus@columbia.edu](mailto:eivinas.butkus@columbia.edu)

website: <https://eivinasbutkus.com/>

---

## EDUCATION

- Columbia University • PhD Psychology • 2021-now  
Supervisor: Niko Kriegeskorte
- Imperial College London • MSc Computer Science • 2018-2019  
Thesis: *Dimensionality Reduction Techniques for Automatic Behavior Descriptors*  
Supervisor: Antoine Cully
- King's College London • BA Philosophy • 2015-2018  
Thesis: *Models, Understanding, and Artificial Intelligence*  
Supervisors: Patrick Butlin and David Papineau
- Vilnius University • BSc in Mathematics (one year completed) • 2014-2015

---

## EXPERIENCE

- Cognitive Computational Neuroscience (CCN) 2026 • Local Committee Chair • 2025-now  
*Organizing the social event, coordinating volunteers*
- NSF AI Institute for Artificial and Natural Intelligence • Trainee • 2024-now  
*Co-organizing the working group on multi-resource cost optimization in neural networks*
- The Columbia University Seminars • Rapporteur • 2025-2026  
*Cognitive and Behavioral Neuroscience Seminar (Chairs: Christopher Baldassano and Herbert S. Terrace)*
- Yale University • Research Assistant • 2019-2021  
*Cognitive and Neural Computation Lab (PI: Ilker Yildirim)*

---

## PUBLICATIONS

- Growing a Neural Network in Breadth, Depth, and Time  
**E. Butkus**, K. Gupta, & N. Kriegeskorte (2026) • *arXiv*
- How attention saves energy in vision  
**E. Butkus**, Z. Ying, & N. Kriegeskorte (2026) • *bioRxiv*
- Causal Discovery and Inference through Next-Token Prediction  
**E. Butkus** & N. Kriegeskorte (2025) • *Neural Information Processing Systems (NeurIPS)*
- Adaptive computation as a new mechanism of dynamic human attention  
M. Belledonne, **E. Butkus**, B. Scholl & I. Yildirim (2025) • *Psychological Review*

- Human-like multiple object tracking through occlusion via gaze-following  
B. Peters\*, **E. Butkus\***, & N. Kriegeskorte (2024) • *Gaze Meets ML Workshop (NeurIPS)*
- How do humans and machine learning models track multiple objects through occlusion?  
B. Peters, **E. Butkus**, & N. Kriegeskorte (2022) • *SVRHM Workshop (NeurIPS)*

\*equal contribution

---

#### CONFERENCE ABSTRACTS

- Blame via Inverse Reinforcement Learning  
**E. Butkus\***, C. Mott\*, N. Kriegeskorte, & C. Baldassano (2026) • *Cognitive Computational Neuroscience (CCN)*
- Attention enables flexible energy-efficient vision  
**E. Butkus**, Z. Ying, & N. Kriegeskorte (2026) • *Vision Sciences Society (VSS)*
- Recurrent Attentional Selection Can Explain Flexible Trading of Accuracy and Energy in Biological Vision  
**E. Butkus**, Z. Ying, P. Chen, & N. Kriegeskorte (2024) • *Cognitive Computational Neuroscience (CCN)*
- FlyingObjects: Testing and aligning humans and machines in gamified object vision tasks  
B. Peters, **E. Butkus**, M. H. Retchin, & N. Kriegeskorte (2024) • *Vision Sciences Society (VSS)*
- Adaptive recurrent visual inference with learnt top-down attention  
**E. Butkus** & N. Kriegeskorte (2024) • *Cosyne 2024*
- Attentional dynamics during multiple object tracking are explained at subsecond resolution by a new ‘hypothesis-driven adaptive computation’ framework  
M. Belledonne, **E. Butkus**, B. Scholl, & I. Yildirim (2021) • *Vision Sciences Society (VSS)*
- Modeling temporal attention in dynamic scenes: Hypothesis-driven resource allocation using adaptive computation explains both objective tracking performance and subjective effort judgments  
**E. Butkus\***, M. Belledonne\*, B. Scholl, & I. Yildirim (2020) • *Proceedings of the Annual Meeting of the Cognitive Science Society*

\*equal contribution

---

#### TALKS

- How attention saves energy in vision  
*Kietzmann Lab, University of Osnabrück* • June 2026
- Blame via Inverse Reinforcement Learning  
*6 College Conference, Yale University* • May 2026
- Lecture on Cognitive Computational Neuroscience  
*UN2430 Cognitive Neuroscience, Columbia University* • May 2026
- Attention enables flexible energy-efficient vision  
*New Perspectives in Computational Modeling of Human Attention Symposium at CogSci 2025* • July 2025
- Causal discovery and inference through next-token prediction  
*Causal Artificial Intelligence Lab, Columbia University* • May 2025
- Attention makes vision energy-efficient  
*Cognitive and Neural Computation Lab, Yale University* • May 2025
- Keynote on NeuroAI  
*Meeting of Young Lithuanian Mathematicians* • December 2024

- Modeling dynamic attention: Hypothesis-driven resource allocation using adaptive computation  
*42nd Annual Conference of the Cognitive Science Society* • August 2020
  - Lecture on cognitive science and AI  
*Marius Jakulis Jason Foundation* • June 2020
- 

#### TUTORIALS

- Statistical inference on representational geometries • *Neuromatch NeuroAI Course* • July 2024
  - Probabilistic programming using Gen • *Workshop at Yale Psychology* • December 2019  
**E. Butkus\***, M. Belledonne\*, H. Yilmaz\*, I. Yildirim
- 

#### TEACHING

- Cognitive Neuroscience • Teaching Assistant • Columbia University • Spring 2026
  - Drugs & Behavior • Teaching Assistant • Columbia University • Fall 2024
  - Statistics for Behavioral Scientists • Teaching Assistant • Columbia University • Fall 2023
  - Research Methods: Human Behavior • Teaching Assistant • Columbia University • Spring 2023
  - Science of Psychology • Teaching Assistant • Columbia University • Spring 2022
- 

#### SERVICE

- Journal reviewer: *Nature Communications*
  - Conference reviewer: *NeurIPS 2026* • *Cognitive Computational Neuroscience (CCN) 2024, 2025* • *Cognitive Science Society (CogSci)* • *NeurIPS Mechanistic Interpretability Workshop 2025*
- 

#### MENTORSHIP

- Manush M. Kalwari • Postbac Research Assistant in Kriegeskorte Lab • Columbia University • 2026-now
  - Peiyu Chen • Postbac Research Assistant in Kriegeskorte Lab • Columbia University • Spring 2024
- 

#### TRAINING

- Computational and Cognitive Neuroscience • Summer School • *Cold Spring Harbor Asia* • June 2024
- 

#### HONORS & AWARDS

- Travel Grant for Cosyne 2024 • Columbia University • 2024 • \$600
  - Scholarship for MSc at Imperial College London • Lithuanian Foundation • 2018 • \$3,500
  - Crowdfunding campaign • Talents for Lithuania Fund • 2018 • €2,000
- 

#### SKILLS

- Proficient in Python, Julia, C#. Deep learning (PyTorch), probabilistic programming (Gen.jl, Pyro), high-performance computing (Slurm).

---

#### EXTRACURRICULAR

- Visual Computational Neuroscience Journal Club at the Zuckerman Institute • Co-organizer • New York, USA • 2021–2025
- Debate Mate • Teaching debating to kids from underprivileged schools • London, UK • 2018–2019
- Academic Buddy • Helping Lithuanian high school students apply to UK universities • Lithuania • 2018–2019
- Kripkenstein • Weekly reading group on Kripke’s interpretation of Wittgenstein, King’s College London • 2017