JORDAN **MATELSKY**

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EDUCATION

2021 — **THE UNIVERSITY OF PENNSYLVANIA**

PH.D CANDIDATE — Department of Bioengineering; Advisor: Konrad Körding

2016 **JOHNS HOPKINS UNIVERSITY**

BSCI — Neuroscience

EXPERIENCE

2016– **Johns Hopkins University Applied Physics Laboratory**

COMPUTATIONAL NEUROSCIENTIST; PROJECT MANAGER

Key projects include brain-mapping efforts such as IARPA MICrONS; NIH-funded work on BossDB, a spatial database for petabyte-scale neuroimagery; and cloud-native network motif detection in connectome datasets. Additional work in machine learning theory; spinal cord injury brain-computer interfaces; and general data-science and machine-learning work. Led and co-led research grants for internal as well as federal funding. Responsible for software engineering teams and production-ready software in broad use by the neuroscience community.

2014– **FitMango**

CHIEF TECHNOLOGY OFFICER & CO-FOUNDER

We founded FitMango to make personal health and fitness training affordable and meaningful to the general public. FitMango pairs users with personal trainers who can help them reach their fitness goals, and tracks health data to improve workout and diet regimens. FitMango is venture-backed, and currently in use at personal-training centers across the east coast of the United States.

RESEARCH

2021– **Dr. Konrad Körding**

PH.D. CANDIDATE

My research focuses on the intersection of biological and machine learning, with a particular emphasis on developing computational models that can effectively model and replicate neural data. I am currently working on projects that involve the mapping between structure and function in the brain enriched by developmental and evolutionary perspectives.

2015–'16 **Dr. Joshua Vogelstein**

Developed software to aid in understanding the complex connectivity of the brain. My primary contributions included the development of the big data volumetric imagery analysis tools, which are now in active use by hundreds of neuroscientists worldwide.

2014 **Dr. Joel Bader**

Code and research contributor on the Synthetic Yeast (Sc2.0) project. Primary projects included developing secure lab-bench digital notebooks for designing and implementing synthetic-biology protocols.

2013 **Dr. Gislin Dagnelie**

Architected digital-diagnostics system to collect patient- and hardware-data after implantation with a retinal prosthesis.

SELECTED PUBLICATIONS

Apr 10, 2025 **Functional connectomics spanning multiple areas of mouse visual cortex**

MICrONS Consortium,✳ INCLUDING JORDAN K. MATELSKY

Nature

Feb 21, 2025 **Local graph-motif features improve gene interaction network prediction**

Victor Julio Leon,✳ JORDAN K MATELSKY, Amanda Ernlund, Lindsey M Kitchell, Kristopher D Rawls, Caitlyn Bishop, Elizabeth Reilly

bioRxiv Preprint

June 1, 2024 **Empirical influence functions to understand the logic of fine-tuning**

✳ JORDAN K MATELSKY, Lyle Ungar, Konrad P Kording

arXiv preprint arXiv:2406.00509

Oct 23, 2024 **Automated segmentation of synchrotron-scanned fossils**

Melanie During,✳ JORDAN MATELSKY, Fredrik Gustafsson, Dennis Voeten, Donglei Chen, Brock Wester, Konrad Kording, Per Ahlberg, Thomas Schön

bioRxiv Preprint

Jul 25, 2023 **A large language model-assisted education tool to provide feedback on open-ended responses**

✳ JORDAN K MATELSKY, Felipe Parodi, Tony Liu, Richard D Lange, Konrad P Kording

arXiv preprint arXiv:2308.02439

Aug 12, 2023

To reverse engineer an entire nervous system

Gal Haspel, Edward S Boyden, Jeffrey Brown, George Church, Netta Cohen, Christopher Fang-Yen, Steven Flavell, Miriam B Goodman, Anne C Hart, Oliver Hobert, Konstantinos Kagias, Shawn Lockery, Yangning Lu, Adam Marblestone,✳ **Jordan Matelsky**, Hanspeter Pfister, Horacio G Rotstein, Monika Scholz, Eli Shlizerman, Quilee Simeon, Vivek Venkatachalam, Guangyu Robert Yang, Eviatar Yemini, Manuel Zimmer, Konrad P Kording

arXiv preprint arXiv:2308.06578

Dec 14, 2021

Scatterbrained: A flexible and expandable pattern for decentralized machine learning

Miller Wilt,✳ **Jordan K. Matelsky**, Andrew S. Gearhart

ArXiv.org

June 22, 2021

DotMotif: an open-source tool for connectome subgraph isomorphism search and graph queries

✳ **Jordan K. Matelsky**, Elizabeth P. Reilly, Erik C. Johnson, Jennifer Stiso, Danielle S. Bassett, Brock A. Wester, William Gray-Roncal

Nature Scientific Reports

Nov 5, 2021

An Integrated Toolkit for Extensible and Reproducible Neuroscience

✳ **Jordan K Matelsky**, Luis Rodriguez, Daniel Xenes, Timothy Gion, Robert Hider Jr., Brock Wester, William Gray-Roncal

EMBC 2021

Sep 29, 2020

Leveraging Tools from Autonomous Navigation for Rapid, Robust Neuron Connectivity

Nathan Drenkow, Justin Joyce,✳ **Jordan Matelsky**, Jennifer Heiko, Reem Larabi, Brock Wester, Dean Kleissas, William Gray-Roncal

MICCAI 2020

Nov 2018

A community-developed open-source computational ecosystem for big neuro data

Joshua T Vogelstein, Eric Perlman, Benjamin Falk, Alex Baden, William Gray Roncal, Vikram Chandrashekhar, Forrest Collman, Sharmishtaa Seshamani, Jesse L Patsolic, Kunal Lillaney, Michael Kazhdan, Robert Hider, Derek Pryor,✳ **Jordan Matelsky**, Timothy Gion, Priya Manavalan, Brock Wester, Mark Chevillet, Eric T Trautman, Khaled Khairy, Eric Bridgeford, Dean M Kleissas, Daniel J Tward, Ailey K Crow, Brian Hsueh, Matthew A Wright, Michael I Miller, Stephen J Smith, R Jacob Vogelstein, Karl Deisseroth, Randal Burns

We discuss the present and future of petabyte-scale neuroscience and connectomics. *Nature Methods*

Apr 2020

Feature engineering with clinical expert knowledge: A case study assessment of machine learning model complexity and performance

Kenneth D. Roe, Vibhu Jawa, Xiaohan Zhang, Christopher G. Chute, Jeremy A. Epstein,✳ **Jordan Matelsky**, Ilya Shpitser, Casey Overby Taylor

PLOS ONE

TALKS & INVITED LECTURES

Feb 28 2019 **Machines Thinking**

We explore potential computational implementations of the biological brain, and examine what this can teach us about improving our artificial neural networks. *Johns Hopkins University HopAI*

Apr 13 2017 **I Have an Idea... Now What?**

A talk on balancing entrepreneurial energy and startup fundraising with school, life, and sleep. *TCO Labs, Baltimore MD*

Apr 4 2017 **Scalable Big Data Infrastructure to Enable Peta-Scale Neuroscience**

A high-level overview of peta-scale neuroscience technologies, including bossDB, intern, and substrate. *Max Planck / Howard Hughes Connectomics Meeting 2017, Berlin*

Nov 10 2015 **Preludes to Piano Concertos: Entrepreneurship on Campus**

I had the tremendous honor of being invited to give a TEDx talk on the state of entrepreneurship at universities. *TEDx Event*

Mar 27 2015 **Low-Cost Tocodynamometry and Fetal Heart-Rate Monitor**

An overview of a low-cost, smartphone-based tocodynamometer-toco-transducer and fetal heart-rate monitor for use in regions of low healthcare accessibility. *The Biomedical Engineering Society Undergraduate Research Conference, Johns Hopkins University*

Dec 2014 **What is a Neuroscientist?**

Interactive demonstration and presentation of neuroscience technology and common cognitive tests to excite middle-school students about neurological and psychological sciences. *Mount Olive Middle School, Mount Olive, NJ*

Apr 15 2014 **Data-validation improvements in retinal prosthesis testing**

Multimedia Presentation. Presented at the Johns Hopkins University Undergraduate Research Symposium. *Johns Hopkins University*

MEMBERSHIPS & APPOINTMENTS

2021– **Computational Neuroscience Initiative (CNI), U. of Pennsylvania**

2014– **Society for Neuroscience (SfN)**

2015–'16 **The American Institute of Chemical Engineers (AIChE)**

2014–'16 **NΨ: The Johns Hopkins University Neuroscience Honors Society**

BOARD MEMBER

Chair for a volunteer community outreach program that brought neuroscience education in an entertaining, enriching format to children in Baltimore City.

2013–'16 **HopHacks**

ORGANIZER

Produced bi-annual, three-day hackathon events for students at Johns Hopkins University as well as the surrounding areas.

2013–'16 **Engineering World Health**

EXECUTIVE

Handled all grants and funding proposals for several teams of undergraduate engineers. Spearheaded the design of a low-cost tocodynanometer to improve childbirth in developing countries. Recipient of the 2014 Johns Hopkins University Student Initiatives Fund.

2012–'16 **Neuroscience Journalism Club**

PRESIDENT

Led undergraduate meetings tailored to discuss recent, notable discoveries in the neuroscience world. Assisted in general understanding of complex biomedical language.

2013–'14 **Sustainable Hopkins Infrastructure Program (SHIP)**

Researched and pitched large-scale projects to university administration in order to improve environmental-friendliness and spread green-awareness on campus.