

Michael Psenka

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About Me

I'm a 3rd year PhD student in EECS (BAIR) at UC Berkeley, advised by Prof. Yi Ma, and was a pure math undergraduate at Princeton. I work on a geometric approach to AI and deep learning, with work spanning **disentangled representation learning**, **computer vision**, and **reinforcement learning**, with a recent focus in **multimodal feature alignment**. My goal is to make and understand deep learning methods that are fully autonomous and self-reliant: hyperparameters that tune themselves, data that labels itself, and all in ways that can extend to various domains.

Education

University of California, Berkeley

MS/PhD in Electrical Engineering and Computer Science

Berkeley, CA

Sept 2021 - Current

- **Coursework:** deep unsupervised learning, nonlinear systems and control, 3D vision, high-dimensional data analysis
- GPA: 4.0/4.0

Princeton University

BA in Mathematics, certificates in Applied Math and Computer Science

Princeton, NJ

Sept 2017 - June 2021

- **CS Coursework:** machine learning, deep learning, weakly supervised learning, reinforcement learning, information theory, complexity theory
- **Math Coursework:** probability theory, stochastic calculus, real/complex analysis, representation theory, geometric PDE, general relativity
- GPA: 3.6/4.0

Publications & Workshop Proceedings

M. Psenka*, A. Escontrela*, P. Abbeel, and Y. Ma (2024). **Learning a Diffusion Model Policy from Rewards via Q-Score Matching**. *ICML 2024*. [Link to paper](#).

M. Psenka, D. Pai, V. Raman, S. Sastry, and Y. Ma (2024). **Representation Learning through Manifold Flattening and Reconstruction**. *JMLR*. [Link to paper](#).

N. Rahmanian, M. Gupta, R. Soatto, S. Nachuri, **M. Psenka**, Y. Ma, and S. Sastry (2023). **Role of Uncertainty in Anticipatory Trajectory Prediction for a Ping-Pong Playing Robot**. *arXiv*. [Link to paper](#).

D. Pai, **M. Psenka**, C.-Y. Chiu, M. Wu, E. Dobriban, and Y. Ma (2023). **Pursuit of a discriminative representation for multiple subspaces via sequential games**. *Journal of the Franklin Institute*. [Link to paper](#).

X. Dai, S. Tong, M. Li, Z. Wu, **M. Psenka**, K. H. R. Chan, P. Zhai, Y. Yu, X. Yuan, H.-Y. Shum, et al. (2022). **CTRL: Closed-Loop Transcription to an LDR via Maximizing Rate Reduction**. *Entropy Journal*. [Link to paper](#).

R. Arbon*, M. Mannan*, **M. Psenka***, and S. Ragavan* (2022). **A Proof of The Triangular Ashbaugh-Benguria-Payne-Pólya-Weinberger Inequality**. *Journal of Spectral Theory*. [Link to paper](#).

M. Psenka and N. Boumal (2020). **Second-order optimization for tensors with fixed tensor-train rank**. *NeurIPS OPT 2020 Workshop*. [Link to paper](#).

M. Psenka, T. Birdal, and L. Guibas (2020). **Reconstruction Without Registration**. *IROS 2020 geometric methods workshop*. [Link to paper](#).

Awards

2020	Peter A. Greenberg '77 Memorial Prize , won for solving an open problem in spectral geometry. Awarded for outstanding accomplishments in Mathematics by juniors	Princeton
2018	HackPrinceton First Place , won first place at intercollegiate hackathon for developing A.I.D.A.N., a chatbot that lets users interact with their dataset with statistical and machine learning tools. Link to project .	Princeton
2018	Manfred Pyka Memorial Prize , awarded to outstanding Physics undergraduates who have shown excellence in course work and promise in independent research	Princeton
2021	Sigma Xi Honors Society , academic honors society for scientific research	Princeton

Work Experience

Lecturer, co-head instructor

University of California, Berkeley

Berkeley, CA

June 2022 - Aug 2022

- Organized and taught lectures for CS 70, an undergraduate class for discrete math and probability theory
- [Link to class page](#)

Undergraduate researcher

Stanford University

Palo Alto, CA

June 2020 - Aug 2020

- Worked with Dr. Tolga Birdal on a novel approach to multi-view reconstruction in computer vision that bypasses pairwise view registration

Undergraduate researcher

Princeton University

Princeton, NJ

June 2019 - Sept 2019

- Worked with Prof. Nicolas Boumal funded by the National Science Foundation through award DMS-1719558
- Successfully developed a state-of-the-art method for computing analytic Hessians and second order optimization over tensor train manifolds

Software engineer

Moovila, Inc.

Charleston, SC

June 2018 - Aug 2018, '17, '16

- Developed a machine learning algorithm for workplace analytics, and improved search engine for quicker and more robust search
- Worked through a patent application, co-inventor in patent for proprietary software
- Worked closely with dev team, participating in stand-up and sprints regularly

Skills

Programming Python (pytorch, JAX, numpy), C#, C, MATLAB, Java, HTML/CSS, JavaScript

Miscellaneous Linux, Shell, \LaTeX , Git, AWS

Interests

Piano Played since I was 3. Grew up mostly classical, got into jazz playing at restaurants in middle/high school.

Princeton Pianist Ensemble College pianist group, focus on ensemble performance, all pieces arranged in-house.

Charity performances, performed in a virtual concert during quarantine ([link](#)).

Music production Look at that, three hobbies for the price of one, so much personality

Games Smash bros, chess, or anything in between; always up to learn a new game

Snowboarding The more trees, the better