Michael Psenka

psenka@eecs.berkeley.edu • michaelpsenka.io • Google Scholar

Education

UC Berkeley **Aug 2021 – Present**
PhD in Electrical Engineering and Computer Science *Berkeley, CA*
GPA: 4.0/4.0 major, 3.95 overall. Member of Berkeley AI Research (BAIR). Stand-in prof. for CS 70 (350+ students).
Advised by Aditi Krishnapriyan. Collaborators include Yann LeCun, Pieter Abbeel, Yi Ma, and Shankar Sastry.

Princeton University **Aug 2017 – May 2021**
B.A. in Mathematics (minors: CS, Applied Math) *Princeton, NJ*
GPA: 3.6/4.0. *Awards:* Peter A. Greenberg '77 Memorial Prize in Mathematics (**solved an open problem** in spectral geometry; published in *Journal of Spectral Theory*), Manfred Pyka Memorial Prize in Physics, 1st place HackPrinceton.

About me: **World models, reinforcement learning, AI+bio/chem**. Prev. pure mathematics researcher. Focus on longer-horizon and out-of-distribution planning. Multi-disciplinary, searching for the right unifying ideas to engineer intelligence.

Experience

Research Scientist Intern @ Meta FAIR (with Yann LeCun) **May 2025 – Dec 2025**

- Identified a failure mode in world-model planners and derived a new robust, parallelized, gradient-based planner.
- Achieved SOTA long-horizon planning performance in action-conditioned video models, improving success rates by up to 2× and reducing planning time by up to 6× versus prior methods.
- Led the project end-to-end as sole first author under Yann LeCun, culminating in an ICML 2026 paper under review, arXiv preprint, open-source release, and external adoption to other world-model repositories.

Undergraduate Researcher @ Princeton, Stanford **Jun – Sep 2019, 2020**

- (*Princeton*) Developed SOTA second-order Riemannian optimization algorithm for tensor-train manifolds, contributing the implementation to the Manopt toolbox. Presented at NeurIPS OPT 2020.
- (*Stanford*) Developed a multi-view 3D reconstruction method that completely bypasses pairwise registration using non-Euclidean ML. Presented at IROS Geometric Methods Workshop 2020.

Machine Learning & AI Engineer @ Moovila, Inc. **Jan – Apr 2025, Jun – Aug 2018, '17, '16**

- Co-inventor on a patent for mathematical modeling of large-scale project connections; remains a core component of the primary product delivered to all customers.
- Co-developed a custom LLM-integrated chatbot with tooling for improved product functionality and ease of use.

Selected Publications

1. **Parallel Stochastic Gradient-Based Planning for World Models.**
   M. Psenka, M. Rabbat, A. Krishnapriyan, Y. LeCun*, A. Bar*. *Submitted to ICML 2026.* [paper] [code]
2. **Action-Minimization Meets Generative Modeling: Efficient Transition Path Sampling with the Onsager-Machlup Functional.**
   S. Raja*, M. Šípka*, M. Psenka*, T. Kreiman, M. Pavelka, A. S. Krishnapriyan. *ICML 2025.* [paper] [code]
3. **Learning a Diffusion Model Policy from Rewards via Q-Score Matching.**
   M. Psenka*, A. Escontrela*, P. Abbeel, Y. Ma. *ICML 2024.* [paper] [code]
4. **Representation Learning via Manifold Flattening and Reconstruction.**
   M. Psenka, D. Pai, V. Raman, S. Sastry, Y. Ma. *JMLR, 2024.* [paper] [code]
5. **Pursuit of a Discriminative Representation for Multiple Subspaces via Sequential Games.**
   D. Pai, M. Psenka, C.-Y. Chiu, M. Wu, E. Dobriban, Y. Ma. *Journal of the Franklin Institute, 2023.* [paper] [code]
6. **A Proof of the Triangular Ashbaugh-Benguria-Payne-Pólya-Weinberger Inequality.**
   R. Arbon*, M. Mannan*, M. Psenka*, S. Ragavan*. *Journal of Spectral Theory, 2022.* [paper]
7. **CTRL: Closed-Loop Transcription to an LDR via Minimaxing Rate Reduction.**
   X. Dai, S. Tong, M. Li, Z. Wu, M. Psenka, K. H. R. Chan, P. Zhai, Y. Yu, X. Yuan, H. Y. Shum, Y. Ma. *Entropy, 2022.* [paper] [code]
8. **Second-Order Optimization for Tensors with Fixed Tensor-Train Rank.**
   M. Psenka, N. Boumal. *NeurIPS OPT Workshop, 2020.* [paper] [code]
9. **Reconstruction Without Registration.**
   M. Psenka, T. Birdal, L. Guibas. *IROS Geometric Methods Workshop, 2020.* [paper] [code]

Skills

Research	RL, world models, diffusion models, stochastic interpolants, control theory, differential geometry
Tools	PyTorch, JAX, Python, C, C#, Linux, Git, Shell, AWS

Interests

Piano, snowboarding, boxing, skateboarding, pole vaulting, music production, chess, mac and cheese, whiskey