Yu-Chia **Chen**

Staff Research Scientist at Meta

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Summary

Summary Five years of experiences in LLM modeling and NLP; three years of experiences in tech-leading AI product development
Expertise Natural Language Processing (NLP), Large Language Model (LLM) RLHF post-training, AI product, tech-leadership (TL)
Programming Python: PyTorch, NumPy, Pandas, spaCy, huggingface (Advanced); SQL: Presto, Spark (Advanced); C++ (Intermediate)

Education

University of Washington *Seattle, WA*

Ph.D. in Electrical Engineering; Advisor: Professor Marina Meilă *Sep. 2016 - Aug. 2021*

National Taiwan University *Taipei, Taiwan*

B.S. in Physics; Advisor: Professor Yang-Fang Chen *Sep. 2011 - Jun. 2015*

Experience

Meta Platforms, Inc. *Seattle, WA*

Staff Research Scientist *Sep. 2021 - Present*

- **Pioneered a novel Generative AI advertising platform from conception to launch, scaling the team from one to 10+ MLEs.** Envisioned in early 2022, prior to the mainstream success of ChatGPT, this platform enhances ad performance while aligning with brand values.
  - **Architected the core AI system** by designing and implementing a multi-objective Reinforcement Learning (PPO) framework to co-optimize ad performance, user engagement, and brand safety.
  - **Innovated in multimodal and trustworthy AI** by developing a vision-aware LLM to mitigate visual clickbait and building a novel hallucination detection model using label distillation.
  - **Delivered $22.9M+ incremental revenue**, achieving a 7.34% top-line improvement in ad quality metrics, culminating in a public launch featured in TechCrunch (`https://yuchaz.github.io/press/202305-techcrunch/`), Jack Clark's Import AI (`https://yuchaz.github.io/press/202508-import-ai-newsletter/`), and other major outlets.
- **Led multilingual expansion of Meta's AI assistant to 40+ countries for the Super Intelligence Lab.** Directed a team of MLEs to drive user growth in key international markets, especially those with low-resource languages.
  - Devised a novel data strategy to mine fine-tuning and preference signals from social engagement on Reels and Threads, overcoming data scarcity in languages like Spanish, Hindi, and Indonesian.
  - Increased Daily Active Users (DAU) by 5% and message sends by over 10% for active users in target regions.

Geometric Data Analysis Group (prof. Marina Meilă), University of Washington *Seattle, WA*

Graduate Research Assistant *Apr. 2017 - Aug. 2021*

- Ph.D. focused on **pioneering novel methods in representation learning to uncover geometric and topological structures in high-dimensional data.**
  - Authored a **NeurIPS'21 oral paper (acceptance rate <1%)** on a novel generalization of spectral clustering, developing a new theoretical framework for higher-order topological data analysis [1].
  - Designed a versatile framework for semi-supervised learning on point clouds and graphs, enabling the discovery of complex topological features and vector field learning from raw data [14].
  - Identified and analyzed a key failure mode in spectral embedding methods for complex manifolds (*NeurIPS'19* [5]).
- **Creator and maintainer of `megaman`, a scalable Python toolkit for manifold learning** capable of processing millions of data points, demonstrating expertise in building high-performance scientific software [8] (`https://github.com/mmp2/megaman`).

Facebook *Seattle, WA*

Machine Learning Intern *Jun. 2020 - Sep. 2020*

- Engineered a deep learning recommendation system for search ads by leveraging NLP and multi-task learning to significantly boost CTR.
- Optimized the production search ad ranking model to achieve a **0.35% gain in Normalized Entropy (NE)**.

Microsoft Research *Redmond, WA*

Research Intern *Jun. 2018 - Sep. 2018*

- Authored a **KDD '19** paper [7] on a scalable model for dynamic social networks (millions of nodes), introducing a novel causal framework to precisely measure the significance of network interventions.
- Engineered the model's high-performance fitting procedure and successfully applied the framework to a unique real-world giraffes social network in the Tarangire Ecosystem, leading to a cross-disciplinary publication in (*Animal Behaviour'21* [2])

Publications

Referred Publications

[1] **Yu-Chia Chen** and Marina Meila. The decomposition of the higher-order homology embedding constructed from the k-Laplacian. *Advances in Neural Information Processing Systems*, 34, 2021; **NeurIPS oral presentation** (acceptance rate 1%)

[2] Juan M. Lavista Ferres, Derek E. Lee, Md Nasir, **Yu-Chia Chen**, Avleen S. Bijral, Fred B. Bercovitch, and Monica L. Bond. Social connectedness and movements among communities of giraffes vary by sex and age class. *Animal Behaviour*, 180:315–328, October 2021

[3] **Yu-Chia Chen**. *Learning Topological Structures and Vector Fields on Manifolds with (Higher-Order) Discrete Laplacians.* PhD thesis, University of Washington, 2021

[4] Samson Koelle, Hanyu Zhang, Marina Meila, and **Yu-Chia Chen**. Manifold Coordinates with Physical Meaning. *arXiv:1811.11891 [stat.ML]*, July 2021. To appear in JMLR.

[5] **Yu-Chia Chen** and Marina Meilă. Selecting the independent coordinates of manifolds with large aspect ratios. In *Advances in Neural Information Processing Systems 32*, pages 1086–1095, 2019

[6] Samson J. Koelle, Hanyu Zhang, Marina Meilă and **Yu-Chia Chen**. Manifold Coordinates with Physical Meaning. *Second Workshop on Machine Learning and the Physical Sciences (NeurIPS 2019)*, Vancouver, Canada, December, 2019

[7] **Yu-Chia Chen**, Avleen S. Bijral, and Juan Lavista Ferres. On Dynamic Network Models and Application to Causal Impact. In *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining*, KDD '19, pages 1194–1204, New York, NY, USA, 2019. ACM

[8] **Yu-Chia Chen**, Dominique Perrault-Joncas, Marina Meilă, and James McQueen. Improved Graph Laplacian via Geometric Self-Consistency. *NIPS Workshop on NIPS Highlights (MLTrain), Learn How to code a paper with state of the art frameworks*, Long Beach, CA, December 2017

[9] Peifeng Jing, Kosuke Winston, **Yu-Chia Chen**, Benjamin S. Freedman, and Lih Y. Lin. Patterning and Colonizing Stem Cells with Optical Trapping. In *Optics in the Life Sciences Congress (2017), Paper OtM4E.2*, page OtM4E.2. Optical Society of America, April 2017

[10] **Yu-Chia Chen**, Cih-Su Wang, Tsung-Yuan Chang, Tai-Yuan Lin, Hsiu-Mei Lin, and Yang-Fang Chen. Ultraviolet and visible random lasers assisted by diatom frustules. *Optics Express*, 23(12):16224–16231, June 2015

[11] Cih-Su Wang, Chi-Shung Liau, Tzu-Ming Sun, **Yu-Chia Chen**, Tai-Yuan Lin, and Yang-Fang Chen. Biologically inspired band-edge laser action from semiconductor with dipole-forbidden band-gap transition. *Scientific Reports*, 5:8965, March 2015

Preprints/Under Review/Technical Reports

[12] Daniel R. Jiang, Alex Nikulkov, **Yu-Chia Chen**, Yang Bai, and Zheqing Zhu. Improving Generative Ad Text on Facebook using Reinforcement Learning. *arXiv:2507.21983 [cs.LG]*, July 2025

[13] Timothy Siegler, Wiley Dunlap-Shohl, Yuhuan Meng, Wylie Kau, Preetham Sunkari, Chang-En Tsai, Zachary Armstrong, **Yu-Chia Chen**, David Beck, Marina Meila, and Hugh Hillhouse. Water-Accelerated Photo-oxidation of CH3NH3PbI3 Perovskite: Mechanism, rate orders, and rate constants. *ChemRxiv*, June 2021

[14] **Yu-Chia Chen**, Marina Meilă, and Ioannis G. Kevrekidis. Helmholtzian Eigenmap: Topological feature discovery & edge flow learning from point cloud data. *arXiv:2103.07626 [stat.ML]*, March 2021

[15] **Yu-Chia Chen**, James McQueen, Samson J. Koelle, Marina Meilă, Stefan Chmiela and Alexandre Tkatchenko. Modern Manifold Learning Methods for MD data – a step by step procedural overview. `http://students.washington.edu/yuchaz/files/2020-md-manifold.pdf`

References

Marina Meilă

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Juan Lavista Ferres

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Minh Phuong Nguyen

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Ioannis G. Kevrekidis

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Yang-Fang Chen

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