

Chi-Heng Lin

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Education

Georgia Institute of Technology

PH.D. IN ELECTRICAL AND COMPUTER ENGINEERING, GPA: 4.0/4.0

- Research focus: design and analysis of machine learning algorithms

Sep. 2017 - Dec. 2022 (Exp.)

Columbia University

M.S. IN STATISTICS, GPA 4.1/4.3

- Coursework in convex optimization, information theory, and statistical inferences

Sep. 2015 - Dec. 2016

National Taiwan University

B.S. & M.S. IN ELECTRICAL ENGINEERING, 3.8/4.0

- Coursework in real analysis, stochastic processes, and probability theory

July. 2007 - Sep. 2013

Work Experience

Ambarella Corporation

ALGORITHM ENGINEER INTERN

- Used TensorFlow and PyTorch to implement various deep learning models for testing the pedestrian crossing predictions and activity classifications
- Benchmarked state-of-the-arts deep learning algorithms on three public pedestrian datasets: PIE, JAAD, and Argoverse
- Implemented the multi-task learning and domain adaption strategies to build up robust deep learning models for generalization in multiple domains
- Performed feature selections on different features, including keypoints, bounding boxes, and images with various processing, to extract essential factors that improve the overall classification performance with minimum computations

California, USA

Jan. 2022 - Apr. 2022

Academia Sinica

NETWORK RESEARCH INTERN

- Developed multi-view 3D video broadcast protocol for media streams of VR devices
- Performed large-scale simulations of channel times with the NS3 802.11n package
- Conducted the analysis of view loss probability in IEEE 802.11 networks

Taipei, Taiwan

Jan. 2015 - July. 2015

Skills

Programming Python, Pytorch, TensorFlow, R, MATLAB, Mathematica, LaTeX

Technical Machine learning, neuroscience, deep learning, Gaussian process, Optimal transport.

Languages Chinese (native) and English (proficient)

Research Experience

Self-Supervised Learning for Neural Data

NEURAL DATA SCIENCE LAB (NERDS) / GEORGIA INSTITUTE OF TECHNOLOGY

- Generalized the popular self-supervised learning methods to scenarios when data augmentation is scarce
- Applied to computer vision and neural image data sets: ImageNet, multi-neuron recordings from primate brains
- Analyzed the proposed algorithm's geometric properties, time complexity, and sampling complexity

Atlanta, GA

Feb. 2021 - Dec. 2021

Domain Adaptation for Image Recognition

NEURAL DATA SCIENCE LAB (NERDS) / GEORGIA INSTITUTE OF TECHNOLOGY

- Developed a novel domain adaption method with an optimal transport algorithm
- Applied our algorithm to digital recognition data sets USPS and MNIST with data augmentation
- Analyzed the proposed algorithm's geometric properties, time complexity, and sampling complexity

Atlanta, GA

Jan. 2020 - Jan. 2021

Hyperparameter Tuning for Deep Learning Models

GEORGIA INSTITUTE OF TECHNOLOGY

- Designed a fast and cost-efficient hyperparameter tuning algorithm based on Bayesian optimization
- Applied to neuroimaging reconstruction that automatically tunes the fully convolutional network
- Achieved an additional 30% cost savings compared with baselines in neuroimaging and synthetic tasks

Atlanta, GA

July 2018 - Dec 2019

Machine Learning Publications

- J.-K. Wang, C.-H. Lin, A. Wibisono, and B. Hu. Provable acceleration of heavy ball beyond quadratics for a class of polyak-Łojasiewicz functions when the non-convexity is averaged-out. In *International Conference on Machine Learning* (21.9%). PMLR, 2022
- R. Liu, M. Azabou, M. Dabagia, C.-H. Lin, M. Gheshlaghi Azar, K. Hengen, M. Valko, and E. Dyer. Drop, swap, and generate: A self-supervised approach for generating neural activity. *Advances in Neural Information Processing Systems (oral <1%)*, 34, 2021
- C.-H. Lin, M. Azabou, and E. Dyer. Making transport more robust and interpretable by moving data through a small number of anchor points. In *International Conference on Machine Learning* (21.5%), pages 6631–6641. PMLR, 2021a
- J.-K. Wang, C.-H. Lin, and J. D. Abernethy. A modular analysis of provable acceleration via polyak's momentum: Training a wide relu network and a deep linear network. In *International Conference on Machine Learning* (21.5%), pages 10816–10827. PMLR, 2021

- J.-K. Wang, C.-H. Lin, and J. Abernethy. Escaping saddle points faster with stochastic momentum. In *International Conference on Learning Representations (26.5%)*, 2019
- C.-H. Lin, J. D. Miano, and E. L. Dyer. Bayesian optimization for modular black-box systems with switching costs. In *Uncertainty in Artificial Intelligence (26%)*, pages 1024–1034. PMLR, 2021b
- M. Azabou, M. G. Azar, R. Liu, C.-H. Lin, E. Johnson, K. Bhaskaran-Nair, M. Dabagia, B. Avila Pires, L. Kitchell, K. B. Hengen, W. Gray Roncal, M. Valko, and E. Dyer. Mine your own view: a self-supervised approach for learning representations of neural activity. In *NeurIPS 2021 Workshop: Self-Supervised Learning - Theory and Practice*, 2021a
- M. Azabou, M. Dabagia, R. Liu, C.-H. Lin, K. B. Hengen, and E. Dyer. Using self-supervision and augmentations to build insights into neural coding. In *NeurIPS 2021 Workshop: Self-Supervised Learning - Theory and Practice*, 2021b

Miscellaneous Publications

- C.-H. Lin, D.-N. Yang, J.-T. Lee, and W. Liao. Efficient error-resilient multicasting for multi-view 3d videos in wireless network. In *2016 IEEE Global Communications Conference (GLOBECOM)*, pages 1–7. IEEE, 2016
- E. Baktash, C.-H. Lin, X. Wang, and M. Karimi. Downlink linear precoders based on statistical csi for multicell mimo-ofdm. *Wireless Communications and Mobile Computing*, 2017, 2017
- F.-M. Tseng, C.-H. Lin, and K.-C. Chen. In-network computations of machine-to-machine communications for wireless robotics. *Wireless personal communications*, 70(3):1097–1119, 2013

Honors & Awards

2020	DEaS-TRIAD Research Scholarship , Georgia Tech	U.S.A.
2016	Davis Fellowship (two times) , Columbia University	U.S.A.
2017	M&H Bourne Fellowship , Georgia Tech	U.S.A.
2017	Studying Abroad Scholarship , Taiwan Ministry of Education	Taiwan
2010	Presidential Award , National Taiwan University	Taiwan

Services

- Reviewer of Neural Information Processing Systems (NeurIPS) 2022
- Reviewer of International Conference on Machine Learning (ICML) 2022
- Sub-reviewer of Conference on Neural Information Processing Systems (NeurIPS) 2021