

HAOZHU WANG

595 S River Rd, Des Plaines, IL, 60016

☎:617-380-9471 ✉:hzwang@umich.edu 🏠:https://www.haozhu-wang.com

in:https://www.linkedin.com/in/haozhuwang/ 🐙:https://github.com/hammer-wang

EMPLOYMENT

3M

St Paul, MN

Machine Learning Scientist

Starting Jan 31, 2022

EDUCATION

University of Michigan

Ann Arbor, MI

Apr 2016 - Dec 2021

- Ph.D. in Electrical and Computer Engineering. Research interests: reinforcement learning, computer vision, machine learning for healthcare. GPA: 3.95/4.00.

Tianjin University & Nankai University

Tianjin, China

Aug 2011 - July 2015

- B.Eng. in Optoelectronics (2+2 joint program). GPA: 3.90/4.00.

Massachusetts Institute of Technology

Boston, MA

Jan 2015 - Jun 2015

- Visiting student, EECS.

SKILLS

Programming Languages: Python, C++, Java, MATLAB, Julia, R

Frameworks & Others: PyTorch, TensorFlow, Keras, Linux, Bash, SQL, Hadoop, Google Cloud Platform, AWS

RESEARCH & INDUSTRY EXPERIENCE

Reinforcement Learning for Automatic Optical Design

University of Michigan & Inlight Technology

Jan 2020 - Dec 2022

- Developed customized sequence generation model based on GRU for generating multi-layer optical designs.
- Trained sequence generation models with PPO algorithm for automatically designing multi-layer optical thin films with target spectrum.
- Designed multiple multi-layer optical thin films with the developed algorithms for real-life applications.
- Proposed algorithm outperforms previous state-of-art algorithm by 5% on the task of designing a 42-layer incandescent light bulb filter.

Patient Risk Stratification with Individual Treatment Effect

University of Michigan

Sep 2018 - Jan 2020

- Proposed a patient risk stratification method based on estimating individual treatment effect under resource constraint settings.
- Cleaned and processed patient EHR data for training patient risk stratification models.
- Developed method outperforms conventional patient risk stratification methods on a real EHR dataset collected at University of Michigan.

Treatment Planning for Occupational Injury

Jan 2018 - Dec 2019

University of Michigan

- Cleaned and analyzed an insurance claim dataset with 1.25 million patient records.
- Trained deep learning models for predicting return to work.
- Learned treatment policies with Q-learning from observational data.
- Evaluated the learned policies with weighted importance sampling.
- Learned policy outperformed clinicians' policy.

Deep Neural Network Compression

Aug 2017 - Jan 2018

University of Michigan

- Implemented ordered weighted ℓ_1 (OWL) and group OWL (GrOWL) regularized deep neural networks in Tensorflow.
- Investigated sparsity inducing and correlation discovering properties of GrOWL for both convolutional layers and fully connected layers of deep neural network.
- Proposed algorithm improved the stability in model compression.
- Successfully compressed LeNet-5 and VGG-16 for more than 10 times.

PUBLICATIONS

Taigao Ma, Mustafa Tobah, **Haozhu Wang***, L. Jay Guo*. Benchmarking deep learning-based models on nanophotonic inverse design problems. *Opto-Electronic Science*, 2022. (*: correspondence)

Haozhu Wang, L. Jay Guo. Neutron: Neural Particle Swarm Optimization for Material-Aware Inverse Design of Structural Color. *Available at SSRN 3992098*, 2022.

Hanfa Song, **Haozhu Wang**, and Vien Van. An Analytical Method for Evaluating the Robustness of Photonic Integrated Circuits. *Journal of Lightwave Technology*, 2022.

Haozhu Wang, Zeyu Zheng, Chengang Ji, L. Jay Guo. Automated Optical Multi-layer Design via Deep Reinforcement Learning. *Machine Learning: Science and Technology*, 2021.

Erkin Otles, **Haozhu Wang**, Suyanpeng Zhang, Brian Denton, Jon Seymour, Jenna Wiens. Return to Work After Injury: A Sequential Prediction & Prescription Problem. *Machine Learning for Healthcare (Clinical Abstract)*, 2019.

Dejiao Zhang*, **Haozhu Wang***, Mario A.T.Figueiredo, Laura Balzano. Learning to Share: Simultaneous Parameter Tying and Sparsification in Deep Learning, *International Conference on Learning Representations (ICLR)*, 2018. (*: co-first author)

Jiaxuan Wang, Jeeheh Oh, **Haozhu Wang**, Jenna Wiens. Learning Credible Models. *Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 2018.

Haozhu Wang, Jeeheh Oh, Eric Horvitz, Jenna Wiens. Targeting Interventions: Improving Estimates for Individual Treatment Effects by Explicitly Modeling Intermediate Events. (Under review)

Jiaxuan Wang, **Haozhu Wang**, Fahad Kamran, Jenna Wiens. Exploiting Spatial and Temporal Invariances when Mining Player Tracking Data in Basketball. (Under review)

Zhao, Qing-Yuan, Di Zhu, Niccolò Calandri, Andrew E. Dane, Adam N. McCaughan, Francesco Bellei, **Hao-Zhu Wang**, Daniel F. Santavicca, and Karl K. Berggren. “Single-photon Imager Based on a Superconducting Nanowire Delay Dine.” *Nature Photonics* 11, no. 4 (2017): 247-251.

Wenqi Zhu, Ting Xu, **Haozhu Wang**, Cheng Zhang, Agrawal Amit, Deotare Parag, Henri Lezec. “Surface-Plasmon-Polariton Laser based on a Metallic Trench Fabry-Perot Resonator”, *Science Advances* (2017).

Wang Haozhu, Yang Fenghe, Yang Fan, Nie Meitong, Yang Jianjun. Investigation of Femtosecond-Laser Induced Periodic Surface Structure on Molybdenum. *Chinese Journal of Lasers*, 42(1), 0103001 (2015).

AWARDS

Rackham Graduate Research Grant (\$3000), University of Michigan, 2020

Rackham Graduate Travel Grant (\$1200), University of Michigan, 2018

Outstanding Graduate Award, Tianjin University, 2015

National Scholarship, Chinese Ministry of Education, 2014

Kitano Foundation of Lifelong Integrated Education Scholarship, Nankai University, 2013

Grand Prize of Physics Competition for College Students, Tianjin, 2013

First Tier Scholarship, Nankai University, 2012

REVIEWING SERVICE

Conference: ICML’22, ICLR’22, NeurIPS’20-21, MLHC’18-21, AMIA’20-21, NeurIPS’20 Meta-learning Workshop, NeurIPS’21 Machine Learning and Physical Science Workshop

Journal: Journal of Physics Communications, AIP Advances

TEACHING AND MENTORING

Graduate student instructor

- EECS 442 Introduction to Computer Vision, Fall 2020
- EECS 504 Computer Vision, Winter 2020
- EECS 545 Machine Learning, Fall 2017

Student mentees

- Zhangxing Bian, current position: Ph.D. student at Johns Hopkins University
- Taigao Ma, current position: Ph.D. student at University of Michigan
- Mustafa Tobah, current position: Ph.D. student at University of Michigan
- Suyanpeng Zhang, current position: Ph.D. student at University of South California
- Yuxi Xie, current position: master student at University of Michigan
- Jiazhen Zhao, current position: undergraduate student at University of Michigan
- Tex White, current position: undergraduate student at University of Michigan
- Diego Tejada, current position: undergraduate student at University of Michigan
- Khoa Bang Tran, current position: undergraduate student at University of Michigan