

# HAOZHU WANG

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## EDUCATION

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### University of Michigan

Apr 2016 - Dec 2021 (Expected)

*Ann Arbor, MI*

- Ph.D. in Electrical and Computer Engineering (ongoing). Research interests: reinforcement learning, computer vision, machine learning for healthcare.
- M.S. in Electrical and Computer Engineering (Signal & Image Processing and Machine Learning). GPA: 3.94/4.00.

### Tianjin University & Nankai University

Aug 2011 - July 2015

*Tianjin, China*

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

### Massachusetts Institute of Technology

Jan 2015 - Jun 2015

*Boston, MA*

- Visiting student, EECS.

## RESEARCH & INDUSTRY EXPERIENCE

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### Reinforcement Learning for Automatic Optical Design

Jan 2020 - Now

*University of Michigan & Inlight Technology*

- 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

Sep 2018 - Jan 2020

*University of Michigan*

- 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 2020

*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  $\ell_1$  (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

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**Haozhu Wang**, Zeyu Zheng, Chengang Ji, L. Jay Guo. Automated Design of Optical Multi-Layer Films with Deep Reinforcement Learning. *Reinforcement Learning for Real Life*, 2020.

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.

(Co-first author) 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.

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. ACM*, 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).

## TEACHING

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**Graduate student instructor** Sep 2020 - Now  
*EECS 442 Introduction to Computer Vision (about 250 students)*

**Graduate student instructor** Jan 2020 - May 2020  
*EECS 504 Computer Vision (about 120 students)*

**Graduate student instructor** Sep 2017 - Dec 2017  
*EECS 545 Machine Learning (about 140 students)*

## SKILLS

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

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

## AWARDS

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**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

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Reviewer for: NeurIPS'20, MLHC'18-20, AMIA'20, NeurIPS'20 Meta-learning Workshop

Subreviewer for: KDD'18-19, NeurIPS'18