

# TZU-MING HARRY HSU

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## EDUCATION

Ph.D. Student in Electrical Engineering and Computer Science

**Massachusetts Institute of Technology**

📅 Sep 2017 – Ongoing

📍 Cambridge, MA

- Research Area: Deep Learning for Clinical Decision Making

GPA: 5.0/5.0

S.M. in Electrical Engineering and Computer Science

**Massachusetts Institute of Technology**

📅 Sep 2017 – May 2020

📍 Cambridge, MA

B.S.E. in Electrical Engineering

B.S. in Physics

**National Taiwan University**

📅 Sep 2011 – Jun 2016

📍 Taipei, Taiwan

Class Rank: 1/190

GPA: 3.99/4.00

## PUBLICATIONS

### 📖 Journals

- **Visceral Adiposity and Severe COVID-19 Disease: Application of an Artificial Intelligence Algorithm to Improve Clinical Risk Prediction**

Open Forum Infectious Diseases

Alexander Goehler, Tzu-Ming Harry Hsu, Jacqueline A. Seiglie, Mark J. Siedner, Janet Lo, Virginia Triant, John Hsu, Andrea Foulkes, Ingrid Bassett, Ramin Khorasani, Deborah J. Wexler, Peter Szolovits, James B. Meigs, Jennifer Manne-Goehler.

- **Three-Dimensional Neural Network to Automatically Assess Liver Tumor Burden Change on Consecutive Liver MRIs**

Journal of the American College of Radiology

Alexander Goehler, Tzu-Ming Harry Hsu, Ronilda Lacson, Isha Gujrathi, Raein Hashemi, Grzegorz Chlebus, Peter Szolovits, and Ramin Khorasani.

- **Transfer Neural Trees: Semi-Supervised Heterogeneous Domain Adaptation and Beyond**

IEEE Transactions on Image Processing (TIP)

Wei-Yu Chen, Tzu-Ming Harry Hsu, Yao-Hung Hubert Tsai, Ming-Syan Chen, and Yu-Chiang Frank Wang.

### 👥 Conference Proceedings

- **DeepOPG: Improving Orthopantomogram Finding Summarization with Weak Supervision**

MICCAI 2021

Tzu-Ming Hsu, Yin-Chih Wang.

- **Federated Visual Classification with Real-World Data Distribution**

ECCV 2020

Tzu-Ming Harry Hsu, Hang Qi, Matthew Brown.

- **CheXpert++: Approximating the CheXpert labeler for Speed, Differentiability, and Probabilistic Output**

MLHC 2020

Matthew B. A. McDermott, Tzu Ming Harry Hsu, Wei-Hung Weng, Marzyeh Ghassemi, Peter Szolovits.

## STRENGTHS

Computer Vision

Federated Learning

ML for Healthcare

Machine Learning

Signal Processing

## LEADERSHIP

MIT Taiwanese Student Association  
**President**

📅 May 2018 – April 2019

- Coordinate events for 100 members, speaker outreach, and career workshops

NTU Toastmasters Club

**Public Relations/Member Vice President**

📅 Mar 2014 – Feb 2015

## WORK EXPERIENCE

WorldQuant

**Data Science Intern**

📅 Jun 2021 – Aug 2021

- Researched market front-running strategies

Google Taiwan (Google Health)

**Software Engineer Intern**

📅 Jun 2020 – Sep 2020

- Implemented explainable deep learning model for lung cancer diagnosis
- Researched multiple techniques for interpretable deep learning

Beth Israel Deaconess Medical Center

**Research Intern**

📅 Nov 2019 – May 2020

- Quantified patient risks for COVID with medical imaging models
- Integrated deep learning information system into hospital PACS workflow

## PUBLICATIONS (CONT'D)

- **Baselines for Chest X-Ray Report Generation** (ML4H Workshop, NeurIPS 2019)  
William Boag, Tzu-Ming Harry Hsu, Matthew McDermott, Gabriela Berner, Emily Alesentzer, Peter Szolovits.
- **Measuring the Effects of Non-Identical Data Distribution for Federated Visual Classification** (FL Workshop, NeurIPS 2019)  
Tzu-Ming Harry Hsu, Hang Qi, Matthew Brown.
- **Clinically Accurate Chest X-Ray Report Generation** (MLHC 2019)  
Tzu-Ming Harry Hsu\*, Guanxiong Liu\*, Matthew McDermott, Willie Boag, Wei-Hung Weng, Peter Szolovits, Marzyeh Ghassemi.
- **3D-Aware Scene Manipulation via Inverse Graphics** (NeurIPS 2018)  
Tzu-Ming Harry Hsu\*, Shunyu Yao\*, Jun-Yan Zhu, Jiajun Wu, Antonio Torralba, William T. Freeman, and Joshua B. Tenenbaum.
- **Unsupervised Multimodal Representation Learning across Medical Images and Reports** (ML4H, NeurIPS 2018)  
Tzu-Ming Harry Hsu, Wei-Hung Weng, Willie Boag, Matthew McDermott, and Peter Szolovits .
- **Learning Food Quality and Safety using Wireless Stickers** (Hotnets 2018)  
Unsoo Ha, Yunfei Ma, Zexuan Zhong, Tzu-Ming Harry Hsu, and Fadel Adib.
- **Transfer Neural Trees for Heterogeneous Domain Adaptation** (ECCV 2016)  
Wei-Yu Chen, Tzu-Ming Harry Hsu, Yao-Hung Hubert Tsai, and Yu-Chiang Frank Wang.
- **Unsupervised Domain Adaptation With Imbalanced Cross-Domain Data** (ICCV 2015)  
Tzu-Ming Harry Hsu, Wei-Yu Chen, Cheng-An Hou, Yao-Hung Hubert Tsai, Yi-Ren Yeh, and Yu-Chiang Frank Wang.
- **Connecting the Dots Without Clues: Unsupervised Domain Adaptation for Cross-domain Visual Classification** (ICIP 2015)  
Wei-Yu Chen, Tzu-Ming Harry Hsu, Cheng-An Hou, Yi-Ren Yeh and Yu-Chiang Frank Wang.

## RESEARCH EXPERIENCE

### MIT Clinical Decision Making Group (MEDG)

**Prof. Peter Szolovits**

📅 Jul 2018 - Ongoing

📍 MIT CSAIL

- Beyond full supervision for uncovering underlying structure of medical radiology data and clinician reports
- 3D medical imaging including MRI and CT
- Medical report generation from radiographs

### Google AI

**Dr. Matthew Brown**

📅 Jun 2019 - Mar 2020

📍 Google

- Investigate the effect of non-identical data in training federated learning visual classifiers

### MIT Computer Vision Group

📅 Feb 2018 - June 2018

📍 MIT CSAIL

- Use 3D-aware vision as inverse-graphics for image editing

## WORK EXP. (CONT'D)

### Google Research

**Research Intern & Student Researcher**

📅 Jun 2019 - Mar 2020

- Investigated visual federated learning with large scale simulations
- Published on novel methods accelerating real-world federated learning

### Brigham and Women's Hospital

**Research Trainee**

📅 Sep 2019 - Mar 2020

- Automated liver lesion diagnosis process to augment radiologists

### Ministry of National Defense, Taiwan

**Substitute Military Service**

📅 Jul 2016 - Jun 2017

## AWARDS

### NTU Taiwan Innovation Award

**Second Place**

📅 2015

- Prototype earbud for music modulation and user sporting statistics

### Altera Innovate Asia FPGA Design Competition

**Silver Medal**

📅 2015

- Designed a custom PCB for music modulation and user sporting statistics

### ICASSP Signal Processing Cup

**Tenth Place**

📅 2015

- Ranked 10th globally in heartbeat detection for sports

### International Physics Olympiad (IPhO)

**Overall First Place**

📅 2011

- Ranked 1st in theory and experiment sections among 401 participants from over 80 countries

## RESEARCH EXPERIENCE (CONT'D)

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### MIT Signal Kinetics Lab

**Prof. Fadel Adib**

📅 Sep 2017 – Jan 2018

📍 MIT Media Lab

- Mobile localization in LTE cellular network
  - Food quality and content detection with wireless signal
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### Multimedia and Machine Learning Lab

**Prof. Yu-Chiang Wang**

📅 Apr 2014 – Jun 2016

📍 Academia Sinica, Taiwan

- Unsupervised domain adaptation with imbalanced cross-domain data
  - Deep learning for heterogeneous domain adaptation
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### Access IC Lab

**Prof. An-Yeu Andy Wu**

📅 Sep 2014 – Jun 2015

📍 NTU, Taiwan

- Noise removal of photoplethysmographic signals
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### Laboratory for Applied Logic and Computation in System Design (ALCom Lab)

**Prof. Jie-Hong Roland Jiang**

📅 Jul 2013 – Jun 2014

📍 NTU, Taiwan

- Continuous-time mathematical models for neurons

## AWARDS (CONT'D)

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### International Junior Science Olympiad (IJSO)

**Gold Medal**

📅 2008

- Ranked top 10% among 300 international participants from over 60 countries