TZU-MING HARRY HSU

Ph.D. Student, Computer Science and Artificial Intelligence Laboratory, MIT

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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

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

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

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)

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

International Junior Science Olympiad (IJSO)

Gold Medal

2008

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

RESEARCH EXPERIENCE (CONT'D)

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

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

Access IC Lab

Prof. An–Yeu Andy Wu

Sep 2014 – Jun 2015 | NTU, Taiwan

- Noise removal of photoplethysmographic signals

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