

# Ethen (Lin-Hsi) Tsao

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## Education

Sep. 2017 – **National Taiwan University (NTU)** Taipei, Taiwan  
June 2021 Bachelor of Science degree in Electrical Engineering  
GPA: **3.58** / 4.30 (Overall), **4.07** / 4.30 (Last 60)  
**Relevant Coursework:** Deep Learning for Computer Vision, Machine Learning, Robot Vision, Web Programming, Data Structure, Algorithms, Computer Architecture, Signals and Systems, Probability and Statistics, Linear Algebra, Differential Equation, Calculus, Discrete Mathematics, Introduction to Computer, Computer Programming

## Research Experience

Mar. 2020 – **Vision and Learning Lab (NTU)** Taipei, Taiwan  
Jan. 2022 **Undergraduate Researcher**, *Advisor: Prof. Yu Chiang (Frank) Wang*

- Propose a disentanglement framework that disentangles facial liveness features and liveness-irrelevant features (i.e., facial content and image domain features) to solve domain generalized Face Anti-Spoofing and reach state-of-the-art performance [1]
- Conduct research on Image Inpainting/Outpainting by reviewing more than 20 papers and participating in weekly meeting with senior peers
- Implemented image classification, generation, segmentation with Pytorch

Aug. 2021 – **Speech Processing and Machine Learning Lab (NTU)** Taipei, Taiwan  
Jan. 2022 **Research Assistant**, *Advisor: Prof. Hung-Yi Lee*

- Carry out research on Question Answering Systems by reproducing top 3 QA models on the leaderboard of the ShARC Dataset

Mar. 2021 – **Multimedia Processing and Communications Lab (NTU)** Taipei, Taiwan  
Aug. 2021 **Research Assistant**, *Advisor: Prof. Homer H. Chen*

- Proposed the concept of balanced facial feature matching and designed a robust masked face recognition system based on the concept [2]
- Developed a continuous image mechanism for employee time clock in with 100% accuracy; accelerate the speed of face alignment by 2 times
- Performed research on Smart Face Recognition Access Control in fisheye camera

Sep. 2019 – **Mixed-Signal IC Lab (NTU)** Taipei, Taiwan  
Jan. 2020 **Undergraduate Researcher**, *Advisor: Prof. Hsin-Shu Chen*

- Measured Switching Loss, DCM, and CCM for Buck/Boost Converter

## Publications

† indicates equal contribution

[1] Zih-Ching Chen†, **Lin-Hsi Tsao†**, Chin-Lun Fu†, Yu-Chiang Frank Wang.  
“Learning Liveness Representation for Domain Generalized Face Anti-Spoofing” [\[PDF Link\]](#)  
- Submitted to the Association for the Advancement of Artificial Intelligence (AAAI), 2022

[2] Yu-Chieh Huang†, **Lin-Hsi Tsao†**, Homer H. Chen.  
“Robust Masked Face Recognition via Balanced Feature Matching” [\[PDF Link\]](#)  
- Accepted by IEEE International Conference on Consumer Electronics (ICCE), 2022

## Work Experience

Mar. 2021 – **Teaching Assistant of Signals and Systems, NTU** Taipei, Taiwan  
June 2021

- Answered questions about Signals and Systems to improve students’ understanding
- Graded and corrected assignments; invigilated midterm and final examinations

May 2020 – **Campus Ambassador, WeMo Scooter** Taipei, Taiwan  
Oct. 2020

- Participated in promotional campaigns to enhance brand image and spread awareness about company products/services
- Leveraged brand-building strategies to expand audience size and reached over 100,000 people

## Honors & Awards

June 2021 **2nd Place, Bachelor Thesis Award** [\[Video Link\]](#)  
awarded by the Department of Electrical Engineering (NTU)

Jan. 2021 **1st Place, Deep Learning for Computer Vision Final Project: Face Anti-Spoofing**  
awarded by Microsoft AI Research Center

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- July 2020 **Best Demo Pitch Award, Startup Intern Camp** [\[Slide Link\]](#)  
awarded by Numbers Co. Ltd.
- Dec. 2019 **3rd Place (category: Cloud Technology), Startup Cup Innovation and Entrepreneurship Competition** [\[Slide Link\]](#)  
awarded by Chihlee University of Technology

## Course Projects

- June 2021 **"Food No-Covid"** [\[Github Link\]](#) [\[Video Link\]](#)  
Networking and Multimedia Lab Final Course Project
- Proposed a decentralized delivery platform to combat the COVID-19 pandemic
  - Created a delivery footprint with Blockchain and Ethereum smart contract
- Jan. 2021 **"FRANK: FeatuRE Anti-spoofing Network"** [\[Github Link\]](#)  
Deep Learning for Computer Vision Final Project
- Proposed a feature disentanglement framework to improve the generalization ability of Face Anti-Spoofing
  - Won 1st place in the Deep Learning for Computer Vision Final Project
- Sep. 2020 – Jan. 2021 **"Tutorial about Deep Learning for Computer Vision"** [\[Github Link\]](#)  
Deep Learning for Computer Vision Course
- Arranged assignments for vision beginners, including Meta Learning, Domain Adaptation, and other foundations, from Deep Learning for Computer Vision Course
- Jan. 2021 **"Online Schedule for Journey"** [\[Github Link\]](#) [\[Video Link\]](#)  
Web Programming Final Course Project
- Applied JavaScript, HTML, and CSS to create a platform for users to plan their trips
  - Allowed users to record their feelings, emotions, and expectations about a place
- June 2020 **"Lane and Road Detection"** [\[Github Link\]](#) [\[Video Link\]](#)  
Robot Vision Final Course Project
- Performed lane/road detection with Image Recognition and Camera Calibration
  - Implemented real-time lane/road detection on Palm Avenue at NTU as a demo video
- June 2020 **"Business Plan for E-Commerce Platform"** [\[Slide Link\]](#) [\[Video Link\]](#)  
Big Data and Business Analytics Final Course Project
- Examined the relation between customer reach and sales of a ladies shoe company via the NAPL model, and proposed a business plan to improve sales performance
- Mar. 2020 – June 2020 **"Tutorial about Machine Learning"** [\[Github Link\]](#)  
Machine Learning Course
- Arranged assignments for ML beginners, including Transfer Learning, Reinforcement Learning, and other foundations, from Machine Learning Course

## Leadership & Extracurricular Activities

- Sep. 2019 – June 2020 **Member, NTU Creativity and Entrepreneurship Program** Taipei, Taiwan
- Engaged in creative brainstorming and proposed a knowledge-based community platform reaching 3,000 people
  - Developed a prototype based on Android studio to convert creativity into action
- Jan. – Mar. 2018/19/20 **Leader (dance team), Electrical Engineering Night (NTU)** Taipei, Taiwan
- Choreographed dance moves and coached students to perform on stage [\[Video Link\]](#)
  - Developed transferable skills such as leadership, problem-solving, and decision-making
- Sep. 2018 – June 2019 **Public Relations Officer, Pop Dance Club (NTU)** Taipei, Taiwan
- Collaborated with Rosy Rosa, a cosmetics company, to obtain sponsorship products
  - Delivered dance performances to over 1,500 people in the final exhibition [\[Video Link\]](#)

## Relevant Skills

- Programming** C/C++, Python, JavaScript, HTML/CSS, MATLAB, Solidity
- Libraries & Toolkits** PyTorch, TensorFlow, Keras, LaTeX, Git, Linux
- Circuit Simulation** Verilog, SIMPLIS, Quartus II, PSpice