Chan-Min Hsu

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Highlights

- Research focused on **biomedical (Microscopy), medical (MRI) imaging**.
- Extensive experience in **deep learning**, **data preprocessing** for **image segmentation**.
- Familiar with interdisciplinary collaboration, including **confocal microscopy imaging** and biomedical **data collection**.

Education

National Taiwan University (NTU) **Sep. 2018 – Jun. 2020**

M.S. in Graduate Institute of Biomedical Electronics and Bioinformatics

- Master Thesis: "**Mitochondrial Structure Prediction in Label-free Microscopy Images Using Convolutional Neural Networks**"
- Honor: **Government Special Education Scholarship (F'18 – S'19)**
- Selected Courses: Computer Vision, Medical Image Analysis, Fundamentals of Biomedical Image Processing, Super Resolution Microscopy Techniques
- GPA: 4.03/4.30

National Taiwan University (NTU) **Sep. 2014 – Jun. 2018**

B.S. in Electrical Engineering

- Honor: **Dean's List (F'17), Government Special Education Scholarship (F'16 – S'17)**
- Selected Courses: Data Structure, The Design and Analysis of Algorithms, Intro. to Digital Speech Processing
- GPA: 3.24/4.30, last60: 4.03/4.30

Technical Skills

- **Programming Language**: Python, C++, HTML/CSS, JavaScript, Shell Scripting
- **Machine Learning/Deep Learning**: PyTorch, Keras, Scikit-learn
- **Image Processing**: OpenCV, ImageJ Macro, Scikit-image
- **Libraries & Toolkits**: LaTeX, Linux

Publication & patent

1. **Chan-Min Hsu**, Yi-Ju Lee, An-Chi Wei. "Convolutional neural networks predict mitochondrial structures from label-free microscopy images". *Accepted to IFMIA 2021*
2. **Chan-Min Hsu**, Yi-Ju Lee, An-Chi Wei. "Using deep learning to predict mitochondria structure in label-free microscopy images". *Poster in TSMRM 2019*
3. **Chan-Min Hsu**, An-Chi Wei, Shao-Ting Chiu, Zih-Hua Chen, Ko-Hong Lin. "Subcellular mitochondria structure prediction in label-free microscope images using convolutional neural networks". *Poster in ICSB 2019*
4. Cheng-You Lee, **Chan-Min Hsu**, Chiou-Shann Fuh. "FASTER FACE CHANGING TECH". *Accepted to CVGIP 2019*

Research Experiences

Multimodal Medical Imaging Optimization Lab, NTU, *Advisor: Prof. Kevin T. Chen* **Sep. 2021 – PRESENT**

Research Assistant *Taipei, Taiwan*

- Researched on **Positron Emission Tomography (PET) reconstruction** using deep learning and multimodal medical imaging.
- Set up the laboratory and the network.

Biomedical System Engineering Lab, NTU, *Advisor: Prof. An-Chi Wei* **Sep. 2020 – Jun. 2021**

Research Assistant *Taipei, Taiwan*

- Researched on **Transformer-based U-Net** for Biomedical Image Segmentation.
- Bulit a **Deep Learning model for Biomedical Image Segmentation**.
  - Accepted to IFMIA2021, Poster in ICSB2019
- Used Zeiss LSM800 for **Confocal Imaging** and **Data Collection**. (AC16 Mitochondria Dataset)

Microfluidics Innovated Bio-Applications Lab, CUHK, *Advisor: Prof. Megan Y.P. HO* **Jul. 2018 – Aug. 2018**
Visiting Research Student *Hong Kong*

- Learned the pratical skills on biomedical research (cell culture) and assisted in sample preparation for cell analysis.

Research Center for Information Technology Innovation, Academia Sinica, *Advisor: Dr. Yu Tsao* **Jul. 2017 – Aug. 2018**
Research Intern *Taipei, Taiwan*

- Researched on **Generative Adversarial Networks (GANs)** for throat disease detection.
- Researched on **Speech Enhancement** using Autoencoder.

Speech Processing Lab, NTU, *Advisor: Prof. Lin-Shan Lee* **Mar. 2017 – Jan. 2018**
Undergraduate Researcher *Taipei, Taiwan*

- Built a **Seq2Seq Chatbot** with sequence GANs and other deep learning methods.
- Paper Survey on state-of-the-art deep learning methods for Natural Language Processing.

Teachings

Teaching Assistant on Introduction to Biomedical Engineering, 2019 Fall Course **Sep. 2019 – Jan. 2020**

- In charge of Homeworks on different topics (**BioModel, Microfluidics, Medical Imaging, Biomedical Optics...**).

Guest Lecturer on Advanced Computer Vision, 2019 Spring Course **Mar. 2019 – Jun. 2019**

- Introduced to **3D Reconstruction** topic.
- Slide Link:

Honors & Awards

Dean's list, Electrical Engineering Dept. at NTU **Fall '17**
Government Special Education Scholarship (2 times), EE, BEBI at NTU **Fall '16 – Spring '17, Fall '18 – Spring '19**
Cathay Financial Holdings Enterprise Award, MakeNTU 2019 (out of 50 teams) **Mar. 2019**
MediaTek Inc Enterprise Award, MakeNTU 2017 (out of 50 teams) **Feb. 2017**
1st Place, 2015 NTU Physics Creative Competition of General Physics Experiment **May. 2015**

Selected Projects

Mitosis Classification with CNN and Explainable Model **Jun. 2019**
Course Final Project of "Medical Image Analysis"

- Built a CNN model for microscopy image classification on mitosis stages.
- Performed **Model Explanation** on CNNs via LIME algorithm.

Faster Face Changing Tech **Jun. 2019**
Course Final Project of "Advanced Computer Vision"

- Developed a machine learning program which can transfer one's face to others.
- Redesigned the algorithm and the architecture of network, reducing the execution time significantly.

Eye Controlled Robotic Arm **Jun. 2017**
Course Final Project of "Electrical Engineering Lab (biomedical Engineering)"

- Built a robotic arm controlled by electrooculography (EOG).
- Designed the algorithm of EOG detection on the open-source electronics platform (Arduino).

Language

- **English**, TOEFL iBT: R28/L28/S22/W22
- **Chinese**, Native
- **German**, Goethe-zertifikat: C1