CHAN-MIN HSU

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HIGHLIGHTS

- Research focused on **biomedical microscopy imaging** and **magnetic resonance imaging (MRI)**.
- Extensive experience in **deep learning and data preprocessing** for **biomedical images**.
- 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 (BEBI)
- Master Thesis: "**Mitochondrial Structure Prediction in Label-free Microscopy Images Using Convolutional Neural Networks**"
- 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 (EE)
- Honor: **Dean's List (F'17), Government Special Education Scholarship (F'16 – S'17, F'17 – S'18)**
- 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

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. 2018 – Jun. 2021**
Master Student, Research Assistant   *Taipei, Taiwan*
- Researched on **Transformer-based U-Net** for Biomedical Image Segmentation. 🔲
  - Submitted to IEEE Transactions on Medical Imaging 📄
- 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.
- Surveyed literature on state-of-the-art deep learning methods for Natural Language Processing.

TECHNICAL SKILLS

- **Programming Language**: Python, C/C++, HTML/CSS, JavaScript, MATLAB, Shell Scripting
- **Machine Learning/Deep Learning**: PyTorch, Keras, Scikit-learn
- **Image Processing**: OpenCV, ImageJ Macro, Scikit-image
- **Libraries & Toolkits**: LaTeX, Linux
- **Microscopy**: Zeiss LSM800, ZEN Blue

PUBLICATION († indicates equal contribution)

1. **Chan-Min Hsu**, An-Chi Wei, "DenT: Dense-Transformer for 3D Biomedical Image Segmentation". *Submitted to IEEE Transactions on Medical Imaging (IEEE TMI)* Manuscript 📄

2. **Chan-Min Hsu**, Yi-Ju Lee, An-Chi Wei, "Convolutional neural networks predict mitochondrial structures from label-free microscopy images". *Accepted to International Forum on Medical Imaging in Asia 2021. Vol. 11792. International Society for Optics and Photonics, 2021 (IFMIA 2021)* 📄

3. **Chan-Min Hsu**, Yi-Ju Lee, An-Chi Wei. "Using deep learning to predict mitochondria structure in label-free microscopy images". *Accepted to 2019 Taiwan Society for Mitochondrial Research and Medicine Conference (TSMRM 2019)* Poster 📄

4. **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". *Accepted to The 20th International Conference on Systems Biology (ICSB 2019)* Poster 📄

5. Cheng-You Lee†, **Chan-Min Hsu**†, Chiou-Shann Fuh. "FASTER FACE CHANGING TECH". *Accepted to Proceedings of IPPR Conference on Computer Vision, Graphics, and Image Processing, Taitung, Taiwan, D2-1, Paper# CV-0006, pp. 1-8, May 2019 (CVGIP 2019)* 📄

TEACHING EXPERIENCES

Teaching Assistant on Introduction to Biomedical Engineering, Fall 2019 Course   **Sep. 2019 – Jan. 2020**
- In charge of Homeworks on different topics (**BioModel, Microfluidics, Medical Imaging, Biomedical Optics, etc.**).

Guest Lecturer on Advanced Computer Vision, Spring 2019 Course   **Mar. 2019 – Jun. 2019**
- Introduced **3D Reconstruction**.
- Slide Link: 📄

HONORS & AWARDS

Dean's list, EE at NTU	**Fall '17**
Government Special Education Scholarship (twice), EE at NTU	**Fall '16 – Spring '17, Fall '17 – Spring '18**
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"
- Accepted to CVGIP 2019.
- Developed a machine learning program which can transfer one's face to others.
- Redesigned the algorithm and network architecture while 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).