Chih-Wei Tseng

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RESEARCH INTERESTS

- Artificial Intelligence: Large Language Models (LLMs), AI, Acceleration, and Compression
- Robotics
- Healthcare Technology

EDUCATION

National Yang Ming Chiao Tung University - Hsinchu, Taiwan
Master of Science, Electrical and Control Engineering | Feb. 2022 –Mar. 2024

- **GPA:** 4.14/4.30
- **Thesis Title:** Remote Photoplethysmography Atrial Fibrillation Detection System Based on Edge Computing Device

Tamkang University - New Taipei City, Taiwan
Bachelor of Science, Electrical and Computer Engineering | Sep. 2018 - Jan. 2022

- **Rank:** 1/81 | **GPA:** 3.969/4.00
- **Thesis Title:** Poker Playing System Based on Deep Learning and Robotic Arm.

RESEARCH EXPERIENCE

National Yangming Chiao Tung University - Hsinchu, Taiwan
Research Assistant(Full-time) | Apr. 2024 - Present

- Developing generative models and classifiers for reconstructing ECG signals from PPG data for multi-class arrhythmia detection (manuscript in preparation).
- Leading a team of three master's students on projects in generative AI, large language models (LLMs), and self-driving car technologies.
- Building a data augmentation system for trajectory prediction, focusing on specific event reconstructions (e.g., car accidents and rare weather conditions).

National Yang Ming Chiao Tung University - Hsinchu, Taiwan
Graduate Researcher | Feb. 2022 - Mar. 2024

- Led the project "Research and Systematic Realization of Imaging-Based Detection of Atrial Fibrillation and Arrhythmia," sponsored by NSTC (3 years, $214,915).
- Published as First Author in the **IEEE Journal of Biomedical and Health Informatics** (Q1, Impact Factor: 7.7).
- Recognized with the **17th TSC Thesis Award - Distinction** (Top 11 out of 1,023 participants).

Tamkang University - New Taipei City, Taiwan
Undergraduate Researcher(Part-time) | Jul. 2021 - Jan. 2022

- Awarded the NSTC Undergraduate Research Project Proposal Fellowship for "Poker Playing System Based on Deep Learning and Robotic Arm" (8 months, $1,600).

TEACHING EXPERIENCE

Teaching Assistant –Automatic Control Systems
Institution: National Yangming Chiao Tung University
Duration: February 2023 –July 2023

- Assisted in preparing lecture materials, grading assignments, and mentoring undergraduate students on topics related to automatic control systems.

Teaching Assistant –Control System Design
Institution: National Yangming Chiao Tung University
Duration: February 2023 –July 2023

- Supported course delivery by organizing tutorials, providing technical support to students, and grading project assignments.
- Mentored undergraduate students in topics related to control system design.

PROJECTS

Research and systematic realization of imaging-based detection of atrial fibrillation and arrhythmia - Hsinchu, Taiwan
Advisor: Chair Professor Bing-Fei Wu | **Sponsor**: National Science and Technology Council
Jul. 2022 | Jul. 2025

- Developed a remote atrial fibrillation (AF) detection system optimized for mobile devices.
- Achieved a **99% reduction** in model size, parameters, and FLOPs, and a **50% reduction** in latency compared to previous studies.
- Delivered a detection accuracy of **90% or higher** across all scenarios, including motion disturbances and variable light conditions.

Poker Playing System Based on Deep Learning and Robotic Arm - New Taipei City, Taiwan
Advisor: Distinguished Professor Ching-Chang Wong | **Sponsor**: National Science and Technology Council
Jul. 2021 – Feb. 2022

- Designed an image classification system for poker playing using YOLO-v4, achieving **98% accuracy**.
- Built a platform and user interface to demonstrate the training process of multiple reinforcement learning (RL) agents executing independent card strategies, achieving a **70% winning rate**.
- Integrated a robotic arm system for card playing, leveraging pose detection to enable automated interaction with users' arm movements.

PUBLICATIONS

Journal paper

- **C. -W. Tseng**, B. -F. Wu*, and Y. Sun, "A Real-Time Contact-Free Atrial Fibrillation Detection System for Mobile Devices," in *IEEE Journal of Biomedical and Health Informatics*, doi: 10.1109/JBHI.2024.3422155 (Accepted for publication in vol. 29, issue 1, January 2025.)

SELECTED COURSES

Master's Courses		**Bachelor's Courses**	
Deep Learning/Deep Learning Lab	A/A	Linear Algebra	96%
Image Processing	A+	Contorl System	95%
Robotics	A+	Operating System	93%
Digital Signal Processing	A-	Introduction to Artificial Neural Network	99%

AWARDS

The Seventeen TSC Thesis Award - Distinction
Taipei City, Taiwan | **Nov. 2024**

- Ranked **Top 11 out of 1,023 graduate students** for exceptional thesis quality.

Graduate Student Presidential Award
Hsinchu, Taiwan | **Feb. 2023**

- Recognized for outstanding research achievements; ranked in the **top 10% of graduate students** and nominated by the department director.

Presidential Award (5 Times)
New Taipei City, Taiwan | **Sep. 2018 –Jan. 2022**

- Ranked in the **top 1% of students in the department** for five consecutive semesters.

National Science and Technology Council Udergraduate Fellowship
Taipei City, Taiwan | **Jul. 2021 - Jan. 2022**

- Awarded to exceptional undergraduate proposals with a highly competitive acceptance rate of less than **30%**.

Undergraduate Thesis Innovation and Creative Award 3^{rd} place
New Taipei City, Taiwan | **Dec. 2021**

- Received the department's highest recognition for undergraduate thesis innovation.

CONFERENCE EXPERIENCE

2023 The International Automatic Control Conference (CACS 2023)
Penghu County, Taiwan | **Oct. 2023**

- Presented a research paper titled "Dual Discriminator GAN-Based Motion-Robust Contact-Free AF Detection System" at the Chinese Automation and Control Society (CACS) Annual Conference.

CACS 2024
Taoyuan, Taiwan | **Nov. 2024**

- Delivered a presentation on the outcomes of the NSTC-funded project, focusing on the development of a contact-free atrial fibrillation (AF) detection system for mobile edge devices.

VOLUNTEER EXPERIENCE

Teaching Robotics in Rural Areas
Advisor: Prof. Chun-Fei Hsu, Tamkang University
Location: Lukang Township, Changhua County, Taiwan
Duration: July 2019

- Help organized robotics workshops for underprivileged students in rural Taiwan, introducing foundational concepts in robotics and inspiring interest in STEM education.
- Promoted equal access to technology education by bridging the gap between urban and rural educational resources.

SKILLS

- **Programming:** Python, C/C++, Java, Kotlin, Matlab, Verilog.
- **Software Tools:** Microsoft Word, Microsoft Excel(Certificate), Microsoft Visio, SolidWorks, Android Studio.