Chia-Hung Yuan

SENIOR RESEARCH ENGINEER

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Google Scholar

Research Interests

My research centers on generative models and efficient machine learning, particularly for image and video processing on mobile devices. I also explore adversarial machine learning to bolster model robustness and real-world performance.

Education

National Tsing Hua University — *Hsinchu, Taiwan*
M.SC. IN COMPUTER SCIENCE — *Sep. 2019 – Jul. 2021*
- Advisor: Shan-Hung Wu
- Thesis: Neural Tangent Generalization Attacks
- Overall GPA: 4.29/4.30 (top 1%)

National Tsing Hua University — *Hsinchu, Taiwan*
B.SC. IN INTERDISCIPLINARY PROGRAM OF ENGINEERING (MATERIAL SCIENCE & QUANTITATIVE FINANCE) — *Sep. 2014 – Jun. 2019*
- Overall GPA: 3.95/4.30, Major GPA: 4.01/4.30, CS-related GPA: 4.16/4.30 (top 1%)

Eberhard Karls University of Tübingen — *Tübingen, Germany*
EXCHANGE PROGRAM IN NANO-SCIENCE — *Oct. 2016 – Jul. 2017*

Work/Research Experiences

MediaTek — *Hsinchu, Taiwan*
SENIOR RESEARCH ENGINEER — *Jun. 2025 – Present*
- Led research into generative models and their deployment on edge devices, focusing on innovative applications.

RESEARCH ENGINEER — *Jun. 2022 – Jun.2025*
- Pioneered research in generative models for edge devices and published a paper "**MAE: A 3nm 0.168mm2 576MAC Mini AutoEncoder with Line-based Depth-First Scheduling for Generative AI in Vision on Edge Devices** " in **ISSCC 2025**, which was selected as a **highlight paper**.
- Researched on the intersection of deep learning and computer vision, specializing in image/video processing like denoising, restoration, and enhancement.
- Developed and deployed ultra-low power and low-latency deep learning models for real-world products, collaborating with product teams on solution optimization, performance profiling, and benchmarking.
- Designed and implemented a departmental codebase, significantly streamlining cross-project collaboration.

MIT-IBM Watson AI Lab — *Massachusetts, USA*
RESEARCH INTERN — *Oct. 2021 – Nov. 2021*
- Advisor: Pin-Yu Chen / Co-advisor: Chia-Mu Yu (National Chiao Tung University)
- Researched on the intersection of meta learning, neural tangent kernel (NTK) and adversarial machine learning and published a paper "**Meta Adversarial Perturbations**" in **AAAI Workshop 2022**.

DataLab, National Tsing Hua University — *Hsinchu, Taiwan*
GRADUATE RESEARCH ASSISTANT — *Sep. 2019 – Jul. 2021*
- Advisor: Shan-Hung Wu
- Researched on neural tangent kernel (NTK) and neural network Gaussian process (NNGP). Studied the trainability and generalizability of neural network and published a paper "**Neural Tangent Generalization Attacks**" in **ICML 2021**.
- Researched on the intersection of machine learning and computer security, with a focus on adversarial example and robustness and published a paper "**Adversarial Robustness via Runtime Masking and Cleansing**" in **ICML 2020**.
- Researched on computer vision, with a focus on face recognition. Designed a face recognition model with the ability to detect and resist adversarial examples, especially for real-world attacks.

DataLab, National Tsing Hua University *Hsinchu, Taiwan*
UNDERGRADUATE RESEARCH ASSISTANT *Sep. 2018 – Aug. 2019*

- Advisor: Shan-Hung Wu
- Researched on natural language processing, with focus on document ranking and passage retrieval. Designed a model for search engine query-document ranking and achieved **13th place** in MS MARCO passage retrieval task.

Advanced Optoelectronic Materials Research Group, National Tsing Hua University *Hsinchu, Taiwan*
UNDERGRADUATE RESEARCH ASSISTANT *Sep. 2017 – Jun. 2018*

- Advisor: Hao-Wu Lin
- Researched on next-generation organic-inorganic hybrid and nano-materials.

Physics of Molecular and Biological Matter, University of Tübingen *Tübingen, Germany*
UNDERGRADUATE RESEARCH ASSISTANT *Oct. 2016 – Jul. 2017*

- Advisor: Frank Schreiber
- Researched on topography and morphology of solar cell and coupled organic-inorganic nanostructure.

Publications

MAE: A 3nm 0.168mm^2 576MAC Mini AutoEncoder with Line-based Depth-First Scheduling for Generative AI in Vision on Edge Devices | Paper *ISSCC 2025, **Highlight Paper***
SHIH-WEI HSIEH, **CHIA-HUNG YUAN**, MING-HUNG LIN, PING-YUAN TSAI, YOU-YU NIAN, CHIA-YUAN CHENG, HUNG-WEI CHIH, PO-HAN CHIANG, MING-HSUAN CHIANG, YUAN-JUNG KUO, YU-WEI WE, YI-SYUAN CHEN, PO-HENG CHEN, SANDY HUANG, MING-EN SHIH, CHIA-PING CHEN, ABRAMS CHEN, SHENKAI CHANG, CHIH-MING WANG, PO-YU YEH, JETT LIU, YUNG-CHANG CHANG, CHUNG-YI CHEN, CHI-CHENG JU, CH WANG, KEVEN JOU

Meta Adversarial Perturbations | Paper *AAAI Workshop 2022*
CHIA-HUNG YUAN, PIN-YU CHEN, CHIA-MU YU

Neural Tangent Generalization Attacks | Paper | Video | Code | Competitions *ICML 2021*
CHIA-HUNG YUAN, SHAN-HUNG WU

Adversarial Robustness via Runtime Masking and Cleansing | Paper | Video | Code *ICML 2020*
YI-HSUAN WU, **CHIA-HUNG YUAN**, SHAN-HUNG WU

Honors & Awards

- **Honorary Member of The Phi Tau Phi Scholastic Honor Society of R.O.C.** (top 3% master's graduands) *2021*
- **Honorary Member of The Phi Tau Phi Scholastic Honor Society of R.O.C.** (top 1% undergraduate graduands) *2018*
- **Academic Achievement Award 3 times** (top 5% students in the class with highest GPA) *2015, 2016, 2018*
- **International Exchange Scholarship** (200,000 NTD/~$7,000) *2016*
- **1st place, Business Case Competition of Seminar on International Trade and Economy** *2016*

Patent

Data Poisoning Method and Data Poisoning Apparatus *US Patent 12,105,810*
SHAN-HUNG WU, **CHIA-HUNG YUAN**

Services & Others

Teaching Assistant	CS565600 Deep Learning, National Tsing Hua University: Fall 2019, Fall 2020
Reviewer	NeurIPS, ICML, ICLR, AAAI, CVPR, IJCAI, CIKM
Languages	Mandarin (Native); English (Fluent, GRE 325/340; TOEFL 109/120); German (Intermediate)
Interests	Football (I have a YouTube channel!), Photography, Travel, Bartending, Ice Skating