

Peter JuChin Chao

New York, NY

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Skills

Programming	Python, SQL, C, JavaScript, HTML/CSS, C Shell, MATLAB
Python Packages	PyTorch, TensorFlow, Numpy, Pandas, NLTK, Flask, Jupyter Notebook, Open AI, Neo4J
Tools & Technologies	Git, Docker, Linux, GNU Debugger, Apache, MongoDB, Nginx, OpenCV, LaTeX, AWS, GCP
Machine Learning	CNN, RNN, LSTM, GRU, Self-Attention, Transformer, GAN, Ridge, Lasso, SVM, Regression Random Forests, AdaBoost, PCA, K-means, Calibration, GPT, GPT2

Education

Columbia University, M.S. in Computer Science	GPA: 3.7	Sept 2022 – Dec 2023	New York
• Leadership role as Vice President of Taiwanese Student Association; TA for Cloud Computing Course.			
National Taiwan University, M.S. in Communication Engineering	GPA: 4.2	Sept 2018 – June 2020	Taiwan
National Central University, B.S. in Communication Engineering	GPA: 3.9	Sept 2018 – June 2020	Taiwan

Work Experience

Research Assistant, Columbia University	<i>New York, NY March 2023 – present</i>
<ul style="list-style-type: none">Conducted cutting-edge research on test-time detection and defenses against adversarial attacks, using Masked Autoencoder to enhance the security and reliability of AI models.Co-led a research initiative with General Electric and Prof. Junfeng Yang, resulting in a co-authored in-depth paper. This work was peer-selected for presentation at the CVPR's AdvML Workshop 2023, standing out within the top 42% of competitive submissions, and emphasized innovative strategies for AI security.	
Research Engineer, National Taiwan University	<i>Taipei, Taiwan Aug 2021 – Aug 2022</i>
<ul style="list-style-type: none">Spearheaded a project within a 5-member team, driving the development of ultra-wideband localization and tracking algorithms, which resulted in a 30% increase in precision and a 25% reduction in latency.Authored and co-developed a proprietary two-tier algorithm that enhanced drone deployment efficiency by 40%, culminating in a publication in the IEEE IoT Journal.Facilitated the creation of educational materials by translating over 200 slides into a comprehensive textbook for Prof. Ruey-Beei Wu's Internet of Things course, which was adopted by the department and used by 150+ students.	
Artificial Intelligence Engineer, Delta Electronics	<i>Taipei, Taiwan July 2020 – March 2021</i>
<i>Delta Electronics is the premier in power solutions and a major supplier of switching supplies and fans.</i> <ul style="list-style-type: none">Engineered and deployed a convolutional neural network (CNN) for oncological diagnostics, achieving 95% accuracy in detecting cancer cells in histopathological images, significantly aiding early diagnosis efforts.Optimized Feature Ranking and Selection Tree algorithm, enhancing processing speed by 400%, thereby reducing the model training time from 12 to 3 hours.Developed an active learning framework that enabled doctors to filter and utilize a high-quality dataset, reducing the required data volume by 70% without compromising diagnostic performance, effectively saving hundreds of hours in manual data selection.	
Software Engineering Intern, Chunghwa Telecom Company	<i>Taoyuan, Taiwan July – Aug 2019</i>
<i>Chunghwa Telecom Company is the largest telecommunications provider in Taiwan.</i> <ul style="list-style-type: none">Engineered a machine learning model that improved the detection accuracy of protective equipment compliance by 20%, significantly enhancing workplace safety protocols.Identified Mask R-CNN as the most effective model for the project after benchmarking against YOLOv3, U-Net, and FCN, resulting in a 30% improvement in instance segmentation accuracy.	

Publications

- Ju-Chin Chao** and Pei-Yuan Wu, "UNet-AIR2: A Single Image Dehazing Network," IEEE Transactions on Emerging Topics in Computational Intelligence | Under Review
- Yun-Yun Tsai, **Ju-Chin Chao**, Junfeng Yang et al., "Test-time Defense against Adversarial Attacks: Detection and Reconstruction of Adversarial Examples via Masked Autoencoder," The IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR), AdvML Workshop, 2023
- Chan, Poh Yuen, **Ju-Chin Chao**, and Ruey-Beei Wu. 2023. "A Wi-Fi-Based Passive Indoor Positioning System via Entropy-Enhanced Deployment of Wi-Fi Sniffers" Sensors 23, no. 3: 1376
- Chen, Y. E., Liew, H. H., **Chao, J. C.**, & Wu, R. B. (2022). Decimeter-Accuracy Positioning for Drones Using Two-Stage Trilateration in a GPS-Denied Environment. IEEE Internet of Things Journal
- C. O. Ancuti et al., "NTIRE 2020 Challenge on NonHomogeneous Dehazing," IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW), 2029-2044, Seattle, WA, USA, Jun. 2020

Selected Projects

LLMA2 Model Enhancement for Contextual Understanding in NLP	<i>June 2023 – present</i>
<ul style="list-style-type: none">Enhanced the LLMA2 model's contextual understanding by fine-tuning with various linguistic datasets, leading to a 35% boost in dialogue session coherence.Adapted the RAG framework to interface with the LLama2 model, facilitating real-time data retrieval from an updated knowledge base, directly increasing QA testing accuracy by 35%.	