Peter JuChin Chao

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Skills

Programming Languages	Python, C, JavaScript, HTML/CSS, Bash Shell, MATLAB
Deep Learning Libraries	PyTorch, TensorFlow, Keras
Tools & Technologies	Git, Docker, Linux, GNU Debugger, Apache, MongoDB, Nginx, OpenCV, LaTeX

Education

Columbia University, M.S. in Computer Science *New York, NY*
GPA: 3.7 | Taiwanese Student Association, Vice President Sept. 2022 – Dec. 2023

National Taiwan University, M.S. in Communication Engineering *Taipei, Taiwan*
GPA: 4.2 | Rank: 16/108 Sept. 2018 – June 2020

National Central University, B.S. in Communication Engineering *Taipei, Taiwan*
GPA: 3.9 | Rank: 2/50 Sept. 2014 – June 2018

Work Experience

Research Assistant, Columbia University *New York, NY | March 2023 – present*
- Research test-time detection and defenses against adversarial attacks, using Masked Autoencoder
- Collaborated with Prof. Junfeng Yang and General Electric on paper for CVPR's AdvML Workshop 2023

Research Assistant, National Taiwan University *Taipei, Taiwan | Aug. 2021 – Aug. 2022*
- Worked in a team of 5 to research ultra-wideband localization and tracking algorithms
- Developed a two-stage algorithm to position drones for deployment, published in IEEE IoT journal
- Translated lecture slides into textbooks for Prof. Ruey-Beei Wu's Internet of Things special topics course

Artificial Intelligence Engineer, Delta Electronics *Taipei, Taiwan | July 2020 – March 2021*
Delta Electronics is a company specializing in batteries and biomedical equipment.
- Built a convolutional neural network (CNN) model to detect cancer cells in whole slide images
- Improved the speed of the Feature Ranking and Selection Tree algorithm by 4x
- Helped doctors select slide images from noisy dataset, using active learning to achieve equivalent performance with just 30% of the data

Software Engineering Intern, Chunghwa Telecom Company *Taoyuan, Taiwan | July – Aug. 2019*
Chunghwa Telecom Company is the largest telecommunications provider in Taiwan.
- Built a ML model to verify that protective equipment was being worn properly by company technicians
- Discovered that Mask R-CNN would best fit the project's use case, after researching Mask R-CNN and YOLOv3 instance segmentation, as well as U-Net and FCN semantic segmentation
- Wrote script to convert data annotated in various formats to unified Pascal, for better compatibility

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

Interactive Image Segmentation *Jan. 2023 – present*
Interactive image segmentation is a critical part of creating labeled datasets for computer vision.
- Improved segmentation by incorporating annotators' click order and mask generation sequence

Depth Map Generation from Dual-Camera Data *Jan. – June 2020*
- Computed depth and disparity maps, using deep pruning and unsupervised appearance matching loss

Text Style Transfer *Jan. – June 2020*
- Built system to translate language from happy to sad, informal to formal, polite to impolite, etc.
- Evaluated translation quality via classification accuracy and BLEU content preservation algorithm