Cheng-En Wu

Contact Information

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Research Interests

My research interests lie at the intersection of computer vision and deep learning. I focus on Code Large Language Models (Code LLMs), Multimodal Large Language Models (MLLMs), and improving the efficiency of self-supervised learning models in both training and inference.

Education

University of Wisconsin-Madison — 2020 – 2025 (Expected)
Ph.D. student in Electrical and Computer Engineering
Advised by Prof. Pedro Morgado and Prof. Yu Hen Hu

National Tsing Hua University — 2014 – 2016
M.S. in Computer Science
Advised by Prof. Jia-Shung Wang

National Taiwan University of Science and Technology — 2009 – 2012
B.S. in Electrical and Computer Engineering

Work Experience

Microsoft, Redmond, WA — Feb. 2024 – Dec. 2024
Research Intern
Mentors: Yunsheng Li, Weijian Xu, Mengchen Liu
• Designed a post-training pipeline to enhance the performance of Code Large Language Models (Code LLMs).
• Developed a Referring Expression Comprehension (REC) dataset to improve zero-shot performance on RefCOCO datasets.

TikTok, San Jose, CA — Jun. 2022 – Sep. 2022
Research Intern
Mentors: Yu Tian, Linjie Yang, Haichao Yu, Heng Wang
• Studied an unsupervised prompt tuning method for vision-language pre-trained models, improving adaptation to downstream tasks. (ICCV'23)

University of Wisconsin-Madison, Madison, WI — Sep. 2022 – Present
Research Assistant
Advisors: Prof. Pedro Morgado and Prof. Yu Hen Hu
• Proposed a prototype-driven curriculum learning approach for Masked Image Modeling (MIM) to address early-stage optimization challenges in self-supervised visual learning. (CVPR'25)
• Developed acceleration methods for Vision Transformer (ViT) contrastive learning, reducing computational costs through sequence compression strategies while maintaining performance. (NeurIPS'24)
• Proposed a token pruning framework for Vision-language Pre-trained Models (WACV'25)
• Proposed block pruning techniques to enhance the efficiency of Convolutional Neural Networks.

NEC Labs America, Princeton, NJ — May 2021 – Aug. 2021
Research Intern
Mentors: Farlay Lai, Asim Kadav
• Proposed a self-supervised video representation learning framework using cascade positive retrieval to enhance contrastive learning and reduce reliance on labeled data. (CVPRW'22)

Academia Sinica, Taipei, Taiwan — 2018 – 2020
Research Assistant
Advisor: Prof. Chu-Song Chen
• Developed continual learning methods for CNNs using model compression, critical weight selection, and progressive expansion to mitigate catastrophic forgetting. (NeurIPS'19)
• Designed efficient deep learning architectures for visual recognition tasks. (MMSP'19)

MediaTek, Hsinchu, Taiwan 2017 – 2018
Software Engineer
Improved the computational efficiency of neural networks on mobile devices and developed mobile GPU drivers to boost run-time of applications using neural networks.

Realtek, Hsinchu, Taiwan 2016 – 2017
Software Engineer
Developed H.264 encoder drivers for TV SOCs.

ITRI, Hsinchu, Taiwan Summer 2015
Research Intern
Developed MultiPath TCP to achieve high throughput of wireless networks.

National Tsing Hua University, Hsinchu, Taiwan 2014 – 2016
Research Assistant
Collaborated with Jia-Shung Wang on real-time vehicle tracking system for visual surveillance.

GOTrust Technology, Taichung, Taiwan 2014
Software Engineer
Developed middlewares for the secure MicroSD card and established an MFC-based testing tool for the production of secure MicroSD cards.

Publications

From Prototypes to General Distributions: An Efficient Curriculum for Masked Image Modeling
Conference on Computer Vision and Pattern Recognition (CVPR) 2025
Jinhong Lin*, ***Cheng-En Wu****, Huanran Li, Jifan Zhang, Yu Hen Hu, Pedro Morgado (*equal contribution)

Patch Ranking: Efficient CLIP by Learning to Rank Local Patches
Winter Conference on Applications of Computer Vision (WACV) 2025
Cheng-En Wu, Jinhong Lin, Yu Hen Hu, Pedro Morgado

Accelerating Augmentation Invariance Pretraining
Conference on Neural Information Processing Systems (NeurIPS) 2024
Jinhong Lin, ****Cheng-En Wu***, Yibing Wei, Pedro Morgado (*equal contribution)

Why Is Prompt Tuning for Vision-Language Models Robust to Noisy Labels?
International Conference on Computer Vision (ICCV) 2023
Cheng-En Wu, Yu Tian, Haichao Yu, Heng Wang, Pedro Morgado, Yu Hen Hu, Linjie Yang

Block Pruning for Enhanced Efficiency in Convolutional Neural Networks
arXiv preprint 2023
Cheng-En Wu, Azadeh Davoodi, Yu Hen Hu

Self-supervised Video Representation Learning with Cascade Positive Retrieval
L3D-IVU Workshop at Conference on Computer Vision and Pattern Recognition (CVPR) 2022
Cheng-En Wu, Farley Lai, Yu Hen Hu, Asim Kadav

Merging Well-Trained Deep CNN Models for Efficient Inference
Conference on Asia Pacific Signal and Information Processing Association (APSIPA) 2020
Cheng-En Wu, Jia-Hong Lee, Timmy ST Wan, Yi-Ming Chan, Chu-Song Chen

Extending Conditional Convolution Structures For Enhancing Multitasking Continual Learning
Conference on Asia Pacific Signal and Information Processing Association (APSIPA) 2020

*Cheng-Hao Tu ***Cheng-En Wu***, Chu-Song Chen (*equal contribution)

Compacting, Picking and Growing for Unforgetting Continual Learning
Conference on Neural Information Processing Systems (NeurIPS) 2019
Steven Hung, Cheng-Hao Tu, ***Cheng-En Wu***, Chien-Hung Chen, Yi-Ming Chan, Chu-Song Chen

IMMVP: An Efficient Daytime and NighttimeOn-Road Object Detector
IEEE International Workshop on Multimedia Signal Processing (MMSP) 2019
Cheng-En Wu, Yi-Ming Chan, Chien-Hung Chen, Wen-Cheng Chen, Chu-Song Chen

On Merging MobileNets for Efficient Multitask Inference
EMC^2 Workshop at IEEE Symposium on High Performance Computer Architecture (HPCA) 2019
Cheng-En Wu, Yi-Ming Chan, Chu-Song Chen

Traffic pattern modeling, trajectory classification and vehicle tracking within urban intersections
IEEE International Smart Cities Conference (ISC2) 2017
Cheng-En Wu, Wen-Yen Yang, Hai-Che Ting, Jia-Shung Wang

Professional Services

Reviewer: WACV '19, WACV '20, WACV '21, CVPR '22, ECCV '22, NeurIPS '22, CVPR '23, ICCV '23, CVPR '24, ECCV '24, NeurIPS'24, ICLR'25, ICML'25, CVPR'25

Honors and Awards

Honorable Mention at the MMSP Challenge 2019
Delta Electronics Scholarship 2016
NTUST ECE Undergraduate Honorable Mention for Research 2012

Selected Projects

Edge AI 2022 – 2024
University of Wisconsin-Madison
Developed innovative block pruning methods for Convolutional Neural Networks, enabling seamless integration with edge devices like the NVIDIA Jetson Nano.

Urban Computing 2015 – 2016
National Tsing Hua University, Visual Communication Lab
Designed a real-time vehicle tracking method from surveillance camera videos and developed a system for trajectory classification and tracklet prediction.

Gesture Recognition 2010 – 2011
National Taiwan University of Science and Technology
Developed a method for detecting the number of fingers raised and built an Android App for gesture control of PowerPoint presentations.

Skills

Computer Languages: C, C++, Bash, Python, MATLAB, LaTeX.
Toolbox/Software: PyTorch, TensorFlow
Languages: Chinese Mandarin (Native), English (Fluent)