2023 ACADEMIA SINICA
EARLY-CAREER INVESTIGATOR
RESEARCH ACHIEVEMENT AWARD

邱 維 辰

國立陽明交通大學資訊工程學系副教授

代表著作：

📖 Wei-Lun Chang, Hui-Po Wang, Wen-Hsiao Peng, **Wei-Chen Chiu**, 2019, "All about Structure: Adapting Structural Information across Domains for Boosting Semantic Segmentation," published in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*.

📖 Hsueh-Ying Lai, Yi-Hsuan Tsai, **Wei-Chen Chiu**, 2019, "Bridging Stereo Matching and Optical Flow via Spatiotemporal Correspondence," published in *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*.

📖 Chia-Hsiang Kao, **Wei-Chen Chiu**, Pin-Yu Chen, 2022, "MAML is a Noisy Contrastive Learner in Classification," published in *International Conference on Learning Representations (ICLR)*.

簡評：

　　發展的演算法賦予深度學習中最困難的問題之一「Domain Adaptation」普遍性及高度適應性。

簡歷：

　　邱維辰博士於 2008 年和 2009 年取得國立交通大學電資學士班及多媒體工程研究所的學士和碩士學位、並於 2016 年自德國馬克斯普朗克電腦科學研究所取得博士學位，而後自 2017 年起任教於國立交通大學資訊工程學系。邱維辰博士的研究專注在結合機器學習或深度模型於電腦視覺的三個主軸上：（1）從視覺數據中發掘語義特徵或學習生成過程、（2）視覺數據之修改與生成、和（3）學習視知覺能力。其學術成果在 2022 年榮獲傑出人才發展基金會年輕學者創新獎與中華民國資訊學會李國鼎青年研究獎的肯定。此外，自 2021 年開始，其也以合聘研究員的身分加入工研院機械所，協助開發自駕車的視覺感測與辨識模組，以更直接的形式貢獻所長於臺灣產業的技術發展。

　　Wei-Chen Chiu received the B.S. degree in Electrical Engineering and Computer Science and the M.S. degree in Computer Science from National Chiao Tung University (Hsinchu, Taiwan) in 2008 and 2009 respectively. He further received Doctor of Engineering Science (Dr.-Ing.) from Max Planck Institute for Informatics (Saarbrücken, Germany) in 2016. He joined Department of Computer Science, National Chiao Tung University as an Assistant Professor from August 2017 and got promoted to Associate Professor in July 2020. His research interests lie in the broad field of computer vision and its combination with various machine learning algorithms. Especially, he focuses on applying deep-learning-based models on (1) discovering the semantic representations

and modelling the underlying generative procedure of visual data, (2) performing editing or synthesis upon visual data, and (3) learning the visual perception. It is worth noting that, as the recognition on his research works, he won the 2022 "Young Scholars' Creativity Award" from the Foundation for the Advancement of Outstanding Scholarship (FAOS) and the 2020 "K. T. Li Young Researcher Award" from the Institute of Information & Computing Machinery. In addition, from May 2021, he was also hired as a Joint Appointment Research Fellow by the Mechanical and Mechatronics Systems Lab of Industrial Technology Research Institute (Taiwan) to help the development of visual perception and recognition modules in the autonomous driving system, attempting to make further contribution to the technology advancement of related industry in Taiwan.

代表作簡介：

隨著深度學習在多個領域帶來突破，其背後成功因素之一的「利用具正確標註的大數據進行訓練」反成為深度學習欲拓展到更多應用時的限制，除針對不同任務都要蒐集相應資料集和人力標註的曠時廢日、在數據蒐集或標註時因數據集內部或是數據集間標準不一而造成偏向外，監督式學習常出現之過擬合現象也會使模型的泛化能力不佳。邱維辰博士專注利用非監督或無監督式學習來增進模型在不同任務或領域的泛化能力，特別是在電腦視覺應用上。其代表作涵蓋了提升跨領域的適應性（例如從虛擬環境轉移知識到現實環境的語意切割任務）、提升跨任務的泛用性（例如跨越深度估測和光流估測兩種不同的視覺感測任務）、和針對跨任務演算法（如元學習）之深入分析和進一步提升成效。

The recent advance of deep learning techniques has brought a magic leap to various fields. Learning from large-scale labeled/supervised dataset, which is

one of the key factors leading to the success of deep learning, however has now turned to be a significant limitation on its extensions to more fields or the applications on practical scenarios. In addition to the expensive cost on time and human resource to collect training datasets for different tasks as well as the inconsistency and bias across various datasets and their corresponding labeling, the supervised learning scenario typically would suffer from the issue of overfitting on the training dataset thus leading to worse generalizability of the learnt models. Dr. Wei-Chen Chiu hence focuses on improving model generalizability across domains and tasks, particularly with respect to the computer vision applications, from the perspective of unsupervised or weakly-supervised learning. His representative works exemplify such research philosophy, boosting the adaptivity across domains (e.g. from virtual to real-world domains on the task of semantic segmentation), connections across tasks (e.g. depth estimation and optical flow estimation tasks), and the performance of knowledge transfer algorithms across tasks (e.g. meta-learning) with further analysis.

得獎感言：

　　非常感謝中央研究院與審查委員們對我研究工作的肯定，讓我獲得中央研究院年輕學者研究成果獎的殊榮。

　　除了感念交通大學、國科會、還有合作單位在資源上的支持，我更要感謝許多師長前輩的提攜鼓勵、研究合作夥伴們的貢獻分享、還有學生的同心付出，我才有機會產出這些成果。除此之外，我要向我的家人們獻上最深的感恩，謝謝他們成為我心靈的支柱、動力的來源、以及最溫暖的避風港。我會保持鬥志繼續往前，將自己所學貢獻給這塊土地。

I am extremely pleased to receive the Academia Sinica Early-Career Investigator Research Achievement Award, with being thankful to Academia Sinica and the review committee for their recognition of my research works.

In addition to being indebted to National Chiao Tung University, National Science and Technology Council, and all the collaborative industries for their resource support, my sincere thanks extend to many seniors/colleagues/collaborators of mine for their invaluable suggestions and encouragement, as well as the sustained contribution made by my students and lab members, in which all of the above have paved the way for my achieving the results today. Furthermore, I would like to express my profound appreciation to my family, for being my tower of strength and my wellspring of motivation. With their unwavering support, I am fortified to maintain my determination, continually progress, and contribute the wealth of knowledge I have gained to our country.