Cheng-Hao Tu

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Education

The Ohio State University — Ohio, USA
Ph.D. in Department of Computer Science and Engineering — 2021–Present

National Taiwan University — Taipei, Taiwan
M.Sc. in Department of Computer Science & Information Engineering — 2015–2018

- GPA: 3.97/4.30, Rank: 60/152

National Taiwan University — Taipei, Taiwan
B.Sc. in Department of Computer Science & Information Engineering — 2011–2015

- GPA: 4.02/4.30, Rank: 7/111

Research Experiences

Ph.D. Student at CSE, OSU — Ohio, USA
Advisor: Dr. Wei-Lun Chao — Aug. 2021 –Present

- **[arXiv 2022, AAAI 2023]** Fractal pre-training for federated learning. A gradient-descent-based framework for effectively learning fractals.
- **[arXiv 2022]** A memory- and parameter-efficient approach for fine-tuning pre-trained vision transformers.

Research Assistant at AINTU Center, NTU — Taipei, Taiwan
Advisor: Dr. Chu-Song Chen — Jan. 2021 –Aug. 2021

- **[INDIN 2021]** Continual learning for defect detection.
- **[TAI 2021, TNNLS 2022]** Binary hash code learning (i.e., to learn binary features for efficient image retrieval) by exploiting semantic guidance.

Research Assistant at Inst. of Information Science, Academia Sinica — Taipei, Taiwan
Advisor: Dr. Chu-Song Chen — Apr. 2019 –Dec. 2020

- **[NeurIPS 2019]** Continual learning with dynamically expanding and shrinking structures.
- **[IJCNN 2020]** Network compression for MobileNet, a lightweight architecture.

Master Student at CSIE, NTU — Taipei, Taiwan
Advisor: Dr. Jane Yung-jen Hsu — Sep. 2015 –Feb. 2018

- **[FG 2019]** A facial action unit detection approach that exploits identity labels. This method achieved state-of-the-art performance.

Publications

* indicates equal contributions

Preprints

[P2] H.-Y. Chen, **C.-H. Tu**, Z. Li, H.-W. Shen, and W.-L. Chao, "On the importance and applicability of pre-training for federated learning", *arXiv preprint arXiv:2206.11488*, 2022.

[P1] **C.-H. Tu***, Z. Mai*, and W.-L. Chao, "Visual query tuning: Towards effective usage of intermediate representations for parameter and memory efficient transfer learning", *arXiv preprint arXiv:2212.03220*, 2022.

Conferences

[C7] **C.-H. Tu***, H.-Y. Chen*, D. Carlyn, and W.-L. Chao, "Learning fractals by gradient descent", in *Proceedings of the AAAI Conference on Artificial Intelligence (AAAI)*, 2023.

[C6] C.-H. Chen, **C.-H. Tu**, J.-D. Li, and C.-S. Chen, "Defect detection using deep lifelong learning", in *2021 IEEE 19th International Conference on Industrial Informatics (INDIN)*, 2021, pp. 1–6.

[C5] **C.-H. Tu**, J.-H. Lee, Y.-M. Chan, and C.-S. Chen, "Pruning depthwise separable convolutions for mobilenet compression", in *IEEE International Joint Conference on Neural Networks (IJCNN)*, 2020, pp. 1–8.

[C4] **C.-H. Tu**, C.-E. Wu, and C.-S. Chen, "Extending conditional convolution structures for enhancing multitasking continual learning", in *Asia-Pacific Signal and Information Processing Association Annual Summit and Conference (APSIPA ASC)*, 2020, pp. 1605–1610.

[C3] S. C.-Y. Hung, **C.-H. Tu**, C.-E. Wu, C.-H. Chen, Y.-M. Chan, and C.-S. Chen, "Compacting, picking and growing for unforgetting continual learning", in *Advances in Neural Information Processing Systems (NeurIPS)*, 2019, pp. 13 669–13 679.

[C2] **C.-H. Tu**, C.-Y. Yang, and J. Y.-j. Hsu, "Idennet: Identity-aware facial action unit detection", in *IEEE International Conference on Automatic Face & Gesture Recognition (FG)*, 2019, pp. 1–8.

[C1] H.-F. Yang, **C.-H. Tu**, and C.-S. Chen, "Adaptive labeling for hash code learning via neural networks", in *IEEE International Conference on Image Processing (ICIP)*, 2019, pp. 2244–2248.

Journals

[J3] H.-F. Yang, **C.-H. Tu**, and C.-S. Chen, "Learning binary hash codes based on adaptable label representations", *IEEE Transactions on Neural Networks and Learning Systems (TNNLS)*, vol. 33, no. 11, pp. 6961–6975, 2022.

[J2] **C.-H. Tu**, H.-F. Yang, S.-M. Yang, M.-C. Yeh, and C.-S. Chen, "Semantichash: Hash coding via semantics-guided label prototype learning", *IEEE Transactions on Artificial Intelligence (TAI)*, vol. 2, no. 1, pp. 42–57, 2021.

[J1] H.-F. Yang, T.-Y. Chen, **C.-H. Tu**, and C.-S. Chen, "Equivalent scanning network of unpadded cnns", *IEEE Signal Processing Letters*, vol. 25, no. 10, pp. 1590–1594, 2018.

Awards and Achievements

- University Fellowship, The Ohio State University 2021
- Reviewer in Pattern Recognition, ELSEVIER 2020
- The Presidential Award (5%), National Taiwan University Fall 2013
- The Presidential Award (5%), National Taiwan University Fall 2012

Invited Talks

- **Compacting, Picking and Growing for Unforgetting Continual Learning** December 2020
  AI Forum 2020 at Howard Civil Service International House, Taipei, Taiwan

Skills

- **Programming Languages:** C/C++, Python, LaTeX
- **Development Tools:** UNIX, PyTorch, Tensorflow, OpenCV, Git