Tung-I Chen

Curriculum Vitae

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tung-i.github.io/

Education

M.S. in CSIE — **National Taiwan University (NTU)**, *Taipei, Taiwan*
- 2019 - 2021, Computer Science and Information Engineering (CSIE)
- GPA: 3.74/4.0

B.S. in BME — **National Cheng Kung University (NCKU)**, *Tainan, Taiwan*
- 2015 - 2019, Biomedical Engineering (BME)
- GPA: 3.96/4.0 (**Top 1%**)

Publications

IROS 2021 — **ODIP: Towards Automatic Adaptation for Object Detection by Interactive Perception**
Tung-I Chen, Jen-Wei Wang, Winston Hsu
In *IEEE/RSJ International Conference on Intelligent Robots and Systems* [Paper] [Video]
- Developed a framework where an object detector in a production line can dynamically generalize to novel workflows without any human annotation by collaborating with a robotic arm.

TMM 2021 — **Dual-Awareness Attention for Few-Shot Object Detection**
Tung-I Chen, Yueh-Cheng Liu, Hung-Ting Su, Y.-C. Chang, Y.-H. Lin, J.-F. Yeh, Winston Hsu
In *IEEE Transactions on Multimedia* [Paper] [Code]
- Presented novel insights into feature matching problems, bringing a 49% performance boost to the few-shot object detection task.

Med-NIPS 2019 — **Batch-Wise Dice Loss: Rethinking the Data Imbalance for Medical Image Segmentation**
Yu-Cheng Chang, Jhih-Yuan Lin, Min-Sheng Wu, Tung-I Chen, Winston Hsu
In *Medical Imaging meets NeurIPS (NeurIPS 2019 Workshops)* [Paper]
- Proposed a volume-aware Dice Loss to re-weight foregrounds across mini-batch to facilitate segmentation on small tumors.

Under Submission — **Anomaly-Aware Semantic Segmentation by Leveraging Synthetic-Unknown Data**
Guan-Rong Lu, Yueh-Cheng Liu, Tung-I Chen, Hung-Ting Su, Tsung-Han Wu, Winston Hsu
To *IEEE Conference on Robotics and Automation* [Paper]
- Proposed to generate synthetic-unknown (adversarial) image regions along the decision boundary to improve anomaly-aware semantic segmentation.

Under Submission — **Adaptive Density-Aware Active Domain Adaptation for Semantic Segmentation**
Tsung-Han Wu, Yi-Syuan Liou, Ricky Yuan, Hsin-Ying Lee, Tung-I Chen, Winston Hsu
- Proposed to label the regions that enable models to learn the representations having low KL divergence over the source and the target domain, saving up to 95% annotation budget.

Research Experience

Research Assistant — **Communications and Multimedia Lab, National Taiwan University**, *Taipei, Taiwan*
2021 - Present, advised by Prof. Winston Hsu
Project: Learning 6-DoF Task-Oriented Grasping for Manipulation Tasks [Video]
with J.-W. Wang, Y.-C. Liu, K.-Y. Jeng, K.-J. Wang, Y.-H. Liu.
- Built a novel end-to-end 6-DoF grasp detector which is twenty times faster and more accurate than previous end-to-end learning-based approaches on unseen cluttered objects.

- Demonstrated few-shot learning that an object detector can be adapted and improved by collaborating with a robotic arm to collect object images.
- Proposed a referring algorithm that can reason human instructions, enabling robotic arms to understand the concept of relative object positions.

Visiting Student **Department of BME in USC Viterbi School of Engineering**, *Los Angeles, CA*
2017 Jul.–Aug., advised by Prof. K. Kirk Shung
Project: Acoustic Tweezers for Cell Manipulation

- Leveraged ultrasound to trap micro-particles so biomedical researchers can manipulate micro-particles like cells without mechanical contact, preventing damage to vulnerable samples.

Activities and Honors

2021 **Journal Reviewer**
IEEE Transactions on Neural Networks and Learning Systems

2020-2021 **Future Tech Awards (2 times)**
Taiwan Innotech Expo, Ministry of Science and Technology, Taiwan
"ODIP: Object Detection by Interactive Perception" (2021)
"3D Object Referring and Grasp Detection Networks" (2020)

2019 **Poster Presentation**
NeurIPS Workshops, Vancouver, Canada
"Batch-Wise Dice Loss: Rethinking the Data Imbalance for Medical Image Segmentation"

2018 **Oral Presentation**
Global Conference on Biomedical Engineering, Taoyuan, Taiwan
"Real-Time Two Dimensional Blood Flow Imaging Using an Vector Doppler Imaging Technique with High-Frequency Ultrasound System" [Slides]

2018 **Best Undergraduate Research Awards (Top 1%)**
Department of Biomedical Engineering, NCKU
"Multi-Angle Doppler Analysis by Ultrafast High Frequency Ultrasound Imaging"

2015 - 2019 **Presidential Awards (4 times)**
Department of Biomedical Engineering, NCKU
Among top 5% in academics performance (every school year)

Certifications

2021 **TOEFL iBT**, *Score:* ***103***, Reading: 30, Listening: 25, Speaking: 21, Writing: 27

2021 **GRE General Test**, *Score:* ***325***, Verbal: 156, Quantitative: 169, Writing: 3.5

Technical Skills

- Programming: Python, MATLAB, C++
- Toolkit: PyTorch, OpenCV, Git, Solidworks, CoppeliaSim, PyBullet
- Language: Mandarin (Native Speaker), English

References

M.S. Advisor **Winston Hsu**
Professor, Department of CSIE, National Taiwan University, Taiwan [Webpage]

B.S. Advisor **Yu-Hua Dean Fang**
Associate Professor, Radiology and Neurology, University of Alabama at Birmingham [Webpage]