# JING-TONG TZENG

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## EDUCATION

**National Tsing Hua University, Hsinchu, Taiwan** *Sep. 2017 - Jan. 2022*
*Bachelor of Power Mechanical Engineering (Minor in Electrical Engineering)*
- Overall GPA:3.71/4.3

**National Tsing Hua University, Hsinchu, Taiwan** *Feb. 2022 - Nov. 2024*
*Master of College of Semiconductor Research*
- Overall GPA:4.01/4.3
- **Research field**: Multitask Learning, Multimodal Learning, Generative Model, Speech and Language Processing

## WORK EXPERIENCE

**Behavioral Informatics** & **Interaction Computation Lab** **National Tsing Hua University, Taiwan**

***Research Assistant*** *Nov. 2024 - Aug.2025*

- Collaborated on industry-academic joint research projects, applying machine learning techniques to real-world challenges in signal processing and healthcare applications.
- Mentored graduate students, providing guidance on research methodologies, deep learning architectures, and experimental design.

## RESEARCH PROJECT

**Behavioral Informatics** & **Interaction Computation Lab** **National Tsing Hua University, Taiwan**

Advisor: Prof. Lee, Chi-Chun

Topic: Noise Robust Speech Emotion Recognition (with CMU MSP Lab, Pittsburgh) *Nov. 2024 - Present*

- Introduced a novel application of Mixture of Experts within WavLM layers to effectively balance speech enhancement and speech emotion recognition, achieving a 3.4% improvement in F1-macro score.

Topic: Multimodal Speech Emotion Recognition *Nov. 2024 - Feb. 2025*

- Employed a multimodal fusion strategy to integrate textual and acoustic features, achieving the highest valence score in the Interspeech 2025 Speech Emotion Recognition in Naturalistic Conditions Challenge.

**Multimodal Signal Processing Lab** **The University of Texas at Dallas, USA**

Advisor: Prof. Busso, Carlos

Topic: Noise Robust Speech Emotion Recognition *Apr. 2024 - Sep. 2024*

- Proposed a shared self-supervised speech representation framework integrating speech enhancement and speech emotion recognition, achieving a 1.8% improvement in F1-Macro score without compromising SE performance.

**Behavioral Informatics** & **Interaction Computation Lab** **National Tsing Hua University, Taiwan**

Advisor: Prof. Lee, Chi-Chun

Topic: Respiratory Sound Classification System *Feb. 2022 - Nov. 2024*

- Proposed a novel noise robust respiratory sound classification system leveraging speech enhancement techniques, resulting in a notable 20.2% increase in sensitivity and a substantial 21.9% improvement in specificity.
- Introduced an innovative patch-wise gamma correction data augmentation technique to improve the ability to capture both continuous and discontinuous features in spectrograms, achieving an 11.8% improvement in sensitivity over state-of-the-art methods.
- Led the development and maintenance of a respiratory sound file collection website using Django.

Topic: Heart Murmur Classification System *Sep. 2023 - Sep. 2024*

- Utilized masked autoencoder techniques to reconstruct missing recordings for cardiac abnormality classification, enhancing robustness and achieving 44.12% lower mean costs in patient outcome classification while outperforming previous state-of-the-art imputation methods; accepted by ICASSP 2025.

Topic: Automatic Kidney Cancer Grading System *Sep. 2023 - Sep. 2024*

- Collaborated on proposing a segmentation mask augmentation approach, achieving an average 5.8% improvement in AUC across various segmentation errors, classification model structures, and datasets compared to conventional augmentation methods.
- Utilized nnUNet for early-stage tumor segmentation, achieving impressive Dice scores of 96.16% for kidneys, 84.79% for tumors, and 71.49% for cysts.
- Utilized MONAI Label to develop an annotation system targeting kidney, tumor, and cyst annotations, employing a pretrained UNet model to generate prediction masks that aid in the labeling process.

## HONORS AND AWARDS

**IEEE ICASSP 2025 Conference Travel Grant** *IEEE Signal Processing Society*
**Student International Visiting Scholarship Award 2024** *National Tsing Hua University*
**Awarded College Student Research Fellowship** *Ministry of Science and Technology (MOST)*
**Japan Formula SAE 2020 9th Place** *Society of Automotive Engineers*

## TECHNICAL SKILLS

- **Programming Languages**: C/C++, Python, MATLAB, Shell, Verilog
- **Technologies**: PyTorch, AWS, Docker, Linux, Git

## PUBLICATION

[1] Yang, J. S., **Tzeng, J. T.**, & Lee, C. C. (2025). **Personalized Federated Learning with Fuzzy Clustering for Dysarthric Speech Recognition,** in ASRU 2025-2025 IEEE Automatic Speech Recognition and Understanding Workshop.

[2] **Tzeng, J. T.**, Su, B. H., Wu, Y. T., Chou, H. H., & Lee, C. C. (2025). **Lessons Learnt: Revisiting Key Training Strategies for Effective Speech Emotion Recognition in the Wild,** in Proceedings of Interspeech 2025.

[3] **Tzeng, J. T.**, Li, J. L., Chen, H. Y., Huang, C. H., Chen, C. H., Fan, C. Y., Huang, E. P. C., & Lee, C. C. (2025). **Improving the Robustness and Clinical Applicability of Automatic Respiratory Sound Classification Using Deep Learning–Based Audio Enhancement: Algorithm Development and Validation,** in Journal of Medical Internet Research AI.

[4] **Tzeng, J. T.**, Leem, S. G., Salman, A., Lee, C. C. & Busso, C. (2025, April). **Noise-Robust Speech Emotion Recognition Using Shared Self-Supervised Representations with Integrated Speech Enhancement,** in ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing.

[5] Chang, A. Y., **Tzeng, J. T.**, Chen, H. Y., Huang, C. H., Huang, E. P. C., & Lee, C. C. (2025, April). **Valve Token Masked Autoencoder for Missing Recordings on Cardiac Abnormality Classification,** in ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing.

[6] Weng, C. C., Chen, H. Y., **Tzeng, J. T.**, Lin, C. H., Kuo, P. C., & Lee, C. C. (2025, April). **Mask Augmentation For Tumor Classification In Medical Images,** in ICASSP 2025-2025 IEEE International Conference on Acoustics, Speech and Signal Processing.

[7] Huang, C. H., Chen, C. H., **Tzeng, J. T.**, Chang, A. Y., Fan, C. Y., Sung, C. W., ... & Huang, E. P. C. (2024). **The unreliability of crackles: insights from a breath sound study using physicians and artificial intelligence,** in NPJ Primary Care Respiratory Medicine, 34(1), 28.

[8] Chang, A. Y., **Tzeng, J. T.**, Chen, H. Y., Sung, C. W., Huang, C. H., Huang, E. P. C., & Lee, C. C. (2024, April). **GaP-Aug: Gamma Patch-Wise Correction Augmentation Method for Respiratory Sound Classification,** in ICASSP 2024-2024 IEEE International Conference on Acoustics, Speech and Signal Processing.