JING-WEN (JOYCELYN) CHEN

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EDUCATION

University of British Columbia, Master of Science in Computer Science, Kelowna, BC, Canada *Sep 2022 - May, 2025*
- Thesis: "Automating Superbubble 3D Segmentation in a Multiphase Interstellar Medium Using Computer Vision"

National Chi Nan University, Bachelor of Science in Computer Science, Nantou, Taiwan *Sep 2018 - Jan 2022*
- Honor: Presidential Award (1/57), Ministry of Science and Technology Scholarships | Cumulative GPA: 3.9/4.0

PROJECT EXPERIENCE

*: Team Lead

Active Exploration of Hidden Physical Properties in Unstructured Environments via Code Policies | NTU *Oct 2025 - Present*
- Developing a curiosity-driven robot exploration framework to efficiently infer hidden physical properties in unseen unstructured environments for robust task execution.

Design of Experiments for Push-to-Talk (PTT) Audio Quality Improvement | Skytrac *Aug 2025 - Oct 2025*
- Designed and led statistical experiments for PTT communication using a D-optimal framework, accelerating the testing process by 36x and isolating 3 principal factors from 20+ contributors to enhance avionics audio clarity.
- Translated analytical findings into actionable design insights through statistical modeling and data visualization, directly guiding 2 product improvements and presenting results in 5+ executive reviews.

Evaluating Universal Inference with Regularized Linear Model | University of British Columbia *Apr 2025 - Aug 2025*
- Simulated the universal inference framework with LASSO models to evaluate the inference method validity and explore extensions to high-dimensional hypothesis testing.

***Supernovae 3D Segmentation and Tracking Using Computer Vision** | University of British Columbia *Sep 2022 - May 2025*
- Engineered a three-fold data pipeline to iteratively construct a superbubble dataset, enabling precise segmentation and tracking of superbubble morphology and evolution using video object segmentation (Astro-VOS), and 3D instance segmentation (Astro-UNETR) techniques.
- Applied these methods to study superbubble evolution in 3D magnetohydrodynamic simulations, refining our understanding of the solar neighborhood's history; presented findings at CASCA 2023 (Penticton), ECCV 2024 (Milan), CVPR 2025 (Nashville).
- Developed a proof of concept demonstrating that DL-based methods can analyze superbubble connectivity beyond traditional porosity metrics.
- Published Astro-UNETR data loader and training scripts as an open-source PyPI package; enabled 3rd-party use in other astro-CV projects.

Disentanglement-Based Multi-Vehicle Tracking for Gate-Free Parking Lot Management | NYCU *Feb 2022 - Jul 2022*
- Enhanced multi-object tracking for parking lot applications, coupled the YOLOv5 detection model with the DeepSORT tracking algorithm.
- Trained, tested, and deployed the tracking system on real-world parking-lot videos to demonstrate its efficacy.
- Implemented background subtraction (GMM) to tackle ID switching during occlusions, thereby improving tracking accuracy by 10%.

***Improving Face Recognition Performance using Triplet Loss** | NCNU *Sep 2020 - Jun 2021*
- Constructed a face recognition system utilizing deep learning (DeepFace, BEGAN-CS model, Triplet Loss) to classify users' identification.
- Led a team of 5 to compete in the NCNU Computer Science Department's annual project contest and was awarded the championship (1/30 teams), along with a national scholarship from the Ministry of Science and Technology.

***"Real or Not? NLP with disaster tweet"** | NCNU *Sep 2020 - Feb 2021*
- Applied several machine learning algorithms (Support Vector Classifier, Multinomial Naïve Bayes) in Python and identified the best method to distinguish whether or not the disaster mentioned in a tweet is factual.

PUBLICATIONS

- Cheng, C. H., **Chen, J. W.**, Su, W. H. and Huang, C.C., "Disentanglement-Based Multi-Vehicle Detection and Tracking for Gate-Free Parking Lot Management," IEEE International Conference on Consumer Electronics (ICCE), Las Vegas, NV, USA, 2023, pp. 1-6.
- **Chen, J. W.**, Shehata, M. S., & Hill, A. S. (2025, July). Astro-VOS: Tracking Supernova Evolution Using Video Object Segmentation. In 2025 International Telecommunications Conference (ITC-Egypt) (pp. 273-278). IEEE.
- **Chen, J. W.**, A. Hill, M. Shehata, "Astro-UNETR: Segmenting Superbubbles in a Multiphase Interstellar Medium," The Astrophysical Journal. American Astronomical Society, 2026

EXTRA-CURRICULAR ACTIVITIES

Association for Computing Machinery (ACM) NCNU Student Chapter | Vice-Chairman *Nov 2019 – Jun 2021*
- Founded Taiwan's first ACM student chapter, recruiting 30+ members and hosted 10+ study events for an average of 13% grade improvement.
- Coordinated 5+ projects that cheered up the campus environment and motivated students' coding passion via programming competitions.

Programming, Math, English Tutor | Volunteer *Feb 2019 – Jun 2020*
- Taught and motivated children from low-income backgrounds, focusing on boosting their academic confidence and success.
- Tutored middle school students in Math and English, using tailored methods to enhance their English understanding and calculation skills.

TECHNICAL SKILLS

- Python, PyTorch, TensorFlow, Scikit-learn, CUDA, Docker, Git/Github, Go, Pandas, Verilog, R, SQL, Tableau, C/C++, MATLAB, ROS

HONORS AND SKILLS

Honors: UBC Okanagan Graduate Research Scholarships, College Student Research Scholarships
Fluent: English, Mandarin, Taiwanese | Interests: Generative Model, Agentic AI, Vision Language Model