Ting-Hsun Chi

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Education

National Taiwan University (NTU) *Taipei, Taiwan*

B.S. in Electrical Engineering *Sep. 2021 - Jun. 2025*

- GPA: **4.27/4.3**; Ranking: **2/197 (top 1.0%).**
- Awards: **Bachelor Thesis Dean's Award**, 4 times Dean's List Awards, Presidential Award.
- Relevant Courses: Signals and Systems, Computer Vision*, Deep Learning for Computer Vision*, Probability and Statistics, Machine Learning* (*graduate level).

Research Experience

Vision and Learning Lab *Taipei, Taiwan*

Undergraduate Researcher, Advisor: Prof. Yu-Chiang Frank Wang *Jun. 2024 - Present*

- Researching on geometrically accurate sparse voxel surface reconstruction. *[under review]*
  - Developed a sparse voxel octree initialization algorithm to reconstruct 3D scenes from foundation model priors.
  - Outperformed 3DGS-based methods by 12% in geometry accuracy.

Multimedia Processing and Communications Lab *Taipei, Taiwan*

Undergraduate Researcher, Advisor: Prof. Homer H. Chen *Jan. 2023 - Jun. 2025*

- Researched on evaluating light field step-edge artifact observability. *[under review]*
  - Proposed a display-calibrated and perceptual-aware light field step-edge characterization.
  - Outperformed baseline visual quality evaluation methods with 0.89 LCC with subjective test results.
- Researched on the perceptual tolerance of split-up effect for light field displays. *[ISMAR '23]*
  - Proposed a theory to explain the observability of split-up effect.
  - Demonstrated that 2 × 2 angular resolution light fields can provide acceptable viewing experiences.

Laboratory for Applied Logic and Computation in System Design *Taipei, Taiwan*

Undergraduate Researcher, Advisor: Prof. Jie-Hong Jiang *Jan. 2023 - Jun. 2025*

- Researched on LLM and formal verification for accounting-related question answering.
  - Developed an SMT-based retrieval and reasoning framework for LLM.
  - Improved LLM accounting-related question answering accuracy by 29% compared to pure reasoning.

IBM Almaden Research Center *San Jose, USA*

Research Intern, Advisor: Dr. Hsinyu Tsai *Jun. 2024 - Sep. 2024*

- Researched on LLM project-level RTL code question answering. *[MLCAD '25]*
  - Developed a project-specific knowledge base construction method using module and signal dependency graphs.
  - Improved RAG-based LLM RTL code question answering accuracy by 27% with a knowledge base retrieval system.

Selected Publications

[1] **T.-H. Chi**, C.-R. Chen, C-T. Hsu, H.-T. Lin, S.-Y. Huang, C. Sun, and Y.-C. F. Wang, "*Advancing Structured Priors for Sparse-Voxel Surface Reconstruction.*" (conference under review).

[2] **T.-H. Chi** and H. H. Chen, "*Observability of Step-Edge Artifact of Light Field AR Display.*" (journal under review).

[3] **T.-H. Chi**, C. Mackin, L. Shi, P. Vijayaraghavan, H. Tsai, and E. Degan, "*RTLExplain: A Structured Approach to RTL Code Summarization and Question Answering for Medium-to-Large Designs Using LLMs.*" The ACM/IEEE 7th Symposium on Machine Learning for CAD (**MLCAD**), 2025. *[PDF]*

[4] B.-C. Chiang, C.-S. Chang, W. Perng, **T.-H. Chi**, Y.-H. Huang, T.-Y. Wei, K.-C. Yen, M.-L. Han, W.-C. Liao, S.-J. Chen, and H. H. Chen, "*Light Field AR Display for Close-Range Applications: Advantages, Use Cases, and Challenges,*" Proceedings SPIE 13388, Advances in Display Technologies XV, 2025. *[PDF]*

[5] **T.-H. Chi**, W. Perng, and H. H. Chen, "*Perceptual Tolerance of Split-Up Effect for Near-Eye Light Field Display.*" The IEEE 22nd International Symposium on Mixed and Augmented Reality (**ISMAR**), 2023. *[PDF]*

Work Experience

Inventec AI Center *Taipei, Taiwan*

Intern, Smart Manufacturing Team *Mar. 2025 - Present*

- Developed a 3D modeling system to construct laptop models from 2D technical drawings.
- Implemented a zero-shot laptop port segmentation pipeline with vision language models.
- Reduced over 99% modeling time (from ~2 weeks to 3 minutes) via a semi-automated 3D reconstruction system.

Honors & Awards

Student Research Scholarship, issued by National Science and Technology Council *Jul. 2024*

RA Scholarship, issued by TSMC-NTU Joint Research Center *Spring '23, Fall '23, Spring '24*

College Student Research Creativity Award, issued by National Science and Technology Council *Jun. 2025*

Dean's Award (for top 2 theses in EECS dept.), NTU Bachelor Thesis Award *Jun. 2025*

Presidential Award/Dean's List (for top 2%/5% students), NTU *Fall '21, Fall '22, Spring '23, Fall '24*

Third Prize, NTUEE Undergraduate Innovation Award *Jul. 2023*

Creativity and Entrepreneurship Excellence Award, NTU D-School *Jun. 2023*

Special Award, 6th ISTUMATE AIoT Competition *Jul. 2022*

Leadership

Creativity and Entrepreneurship Program *Taipei, Taiwan*

Team Leader *Sep. 2022 - Jun. 2023*

- Led a 5-member team to propose a business plan for an AI-driven recruitment startup, conducting market analysis, building financial projections, and defining go-to-market strategy.
- Received Excellence Award (top 3 out of 10+ teams) in the 2023 NTU D-School.

Selected Projects

StageLight: A Multi-Concept Personalization Framework *[Poster]* *Fall 2024*

CommE 5052 Deep Learning for Computer Vision

- Designed a diffusion-based multi-step inpainting pipeline guided by LLM-decomposed prompts and object masks.
- Introduced Spotlight Prompting for localized guidance during layered diffusion.
- Led a 4-member team; project ranked 1st in the course.

Monitoring of Door Status in Public Transit Systems *[Report]* *Spring 2024*

EEE 5053 Computer Vision

- Proposed a feature extracting algorithm to detect door opening/closing in various lighting conditions.
- Trained a YOLO v8 model to detect coarse door frames.

Teaching Assistant Experience

CommE 5052 Deep Learning for Computer Vision at **NTU** (Graduate Level) *Fall 2025*

Instructor: Prof. Yu-Chiang Frank Wang

- Designed a homework on sparse-view 3D Gaussian Splatting.
- Hold weekly TA hours.

EE 1006 Cornerstone EECS Design and Implementation at **NTU** *Spring 2024*

Instructors: Prof. Feng-Li Lian, Prof. Ho-Lin Chen, Prof. Yi-Chang Lu

- Mentored freshmen in hardware (Arduino, Raspberry Pi) and software (C++, Python) labs, guiding them to design and implement solutions to open-ended engineering problems.
- Coached project teams to maintain systematic experiment logs and progress reports.