Zhongxiao (Clara) Cong

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Computer Vision | GPA: 4.06/4.0 — Dec. 2025
- Relevant Courses: Visual Learning and Recognition, Geometry-based Methods in Vision

ShanghaiTech University — Shanghai, China
B.Eng. Computer Science and Technology | GPA: 3.83/4.0 | Rank: 6/247 — Jun. 2024
- Relevant Courses: Deep Learning, Introduction to Machine Learning, Artificial Intelligence

Massachusetts Institute of Technology — Cambridge, MA
Exchange Student, Computer Science | GPA: 5.0/5.0 — Feb. 2023 – May 2023
- Courses: Advances in Computer Vision, Matrix Methods

RESEARCH INTEREST

3D/4D reconstruction, neural rendering, 3D computer vision

PUBLICATION

- **Flow3r: Factored Flow Prediction for Visual Geometry Learning**
Zhongxiao Cong, Qitao Zhao, Minsik Jeon, Shubham Tulsiani
In Submission, 2025. [project page]

- **RadarSim: Simulating Single-Chip Radar via Multimodal Neural Fields**
Chuhan Chen, Tianshu Huang, Akarsh Prabhakara, Chaithanya Kumar Mummadi, Zhongxiao Cong, Anthony Rowe, Matthew O'Toole, Deva Ramanan
3DV, 2026.

- **Dynamic Neural Fields for Learning Atlases of 4D Fetal MRI Time-series**
Zeen Chi, Zhongxiao Cong*, Clinton J. Wang, Yingcheng Liu, Esra Abaci Turk, P. Ellen Grant, S. Mazdak Abulnaga, Polina Golland, Neel Dey (*Equal contribution)*
Medical Imaging Meets NeurIPS (NeurIPS Workshop), 2023. [paper][code]

RESEARCH EXPERIENCE

Physical Perception Lab, Carnegie Mellon University — Pittsburgh, PA
Graduate Researcher / Advisor: Prof. Shubham Tulsiani — Jan. 2025 – Present
- Developed a factored-flow formulation that decomposes flow into source-view geometry and target-view camera motion, enabling the model to learn geometry from flow supervision instead of relying on dense 3D labels
- Implemented a joint training framework that learns geometry (camera pose, depth, pointmaps) together with a factored-flow head, leveraging flow supervision from large-scale unlabeled videos in addition to standard geometry supervision
- Achieved state-of-the-art performance on dynamic-scene benchmarks using significantly less labeled 3D data

Light Transport Lab, Carnegie Mellon University — Pittsburgh, PA
Graduate Researcher / Advisor: Prof. Matthew O'Toole — Sep. 2024 – May 2025
- Developed a multimodal neural-field framework that integrates mmWave radar with RGB camera data to produce high-resolution radar geometry and range-Doppler simulations, improving upon radar-only reconstruction methods
- Contributed the metric scene-scale optimization module, designing an SSIM-based strategy that aligns COLMAP's scale-ambiguous camera poses with radar measurements by comparing synthesized and real range–Doppler structures
- Achieved higher PSNR/SSIM in radar novel-view synthesis, sharper geometric reconstructions, and improved multimodal alignment across diverse indoor/outdoor scenes, outperforming prior radar-only baselines

Plus Lab, ShanghaiTech University — Shanghai, China
Undergraduate Researcher / Advisor: Prof. Xuming He — Sep. 2023 – May 2024
- Proposed a text-guided training approach to enhance the domain generalization of open-vocabulary segmentation models using CLIP
- Eliminated domain-specific information from image features by training a multilayer perceptron with paired text prompts, leveraging the alignment between text and image feature spaces in vision-language models
- Achieved approximately 3% improvement in Mean Intersection over Union (mIoU) on domain generalization datasets, surpassing the open-vocabulary segmentation baseline

Medical Vision Group, MIT CSAIL Cambridge, MA
Undergraduate Researcher / Advisor: Prof. Polina Golland, Dr. Neel Dey Feb. 2023 – Sep. 2023

- Utilized dynamic neural fields to stabilize 4D MRI time-series of fetal MRI acquisitions, enabling fast construction of biomedical image atlases
- Simultaneously obtained atlas and image-to-atlas deformations by learning a compactly parameterized neural field
- Yielded high-quality atlases with competitive registration performance and ~5-7 times faster convergence compared to existing work

SELECTED PROJECTS

Radar-Based Vibration Frequency Recovery Using mmWave [report] Pittsburgh, PA
CMU 16823: Physics-based Methods in Vision Jan. 2025 – May 2025

- Developed a time-domain method to recover vibration frequency from **raw IQ radar signals**, overcoming Doppler FFT limitations for high-frequency micro-vibrations
- Utilized a synchronized radar–camera–LiDAR sensing rig to validate the approach in controlled Chladni-plate experiments, achieving accurate recovery of 20–60 Hz vibrations

Chinese Chess [report] Shanghai, China
ShanghaiTech CS181: Artificial Intelligence Nov. 2022 – Jan. 2023

- Developed a Chinese Chess game from scratch using Python and C++, featuring a user-friendly game interface for human players
- Designed and implemented three AI agents using MinMax Search, Q-Learning, and Monte-Carlo Tree Search algorithms
- Achieved a 100% win rate with these AI agents against a random agent implemented with a randomized algorithm

Longan Nano Chrome Dino Runner Game [report] Shanghai, China
ShanghaiTech CS110P: Computer Architecture Feb. 2022 – May 2022

- Implemented a Chrome Dino Runner Game using the Longan Nano development board
- Utilized PlarformIO to interact with the development board and implemented the framework by C and RISC-V instruction set

WORK EXPERIENCE

CCB Fintech Company Nanjing, Jiangsu, China
Java Developer Intern July 2022 – Aug. 2022

- Contributed to the "Wuxi Housing Service Unified Platform" project, streamlining the entire property area management process into an online platform, enhancing overall efficiency
- Developed key system functionalities, including interfaces, and wrote testable Java code that received 95% positive feedback from mentors
- Discovered and fixed 10+ programming bugs, which significantly improved the stability and reliability of the 'Wuxi Housing Service Unified Platform'

SKILLS

- **Programming Languages**: Python, C, C++, Javascript, HTML, Bash, MATLAB, R, RISC-V
- **Technologies/Frameworks**: AWS (EC2), Linux, Git, PyTorch, TensorFlow, OpenCV, OpenGL, Numpy, Markdown, Matplotlib, Scikit-learn, Scipy

HONORS AND AWARDS

- Outstanding Graduates of Shanghai (top 5%)
- Outstanding Student at ShanghaiTech University (top 3%)