HUAN CHEN

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Undergraduate Student

EDUCATION

Sun Yat-sen University *Sep. 2023 – Jun. 2027*
B.Eng. in Remote Sensing Science and Technology *GPA: 3.94/5.00*
School of Geospatial Engineering and Science, Zhuhai, China

RESEARCH INTERESTS

Urban Resilience, GeoAI, Causal Inference, Spatio-temporal Data Analysis

PUBLICATIONS

Journal Papers

[1] **H. Chen**†, C.X. Du†, T. Han†, Y.F. Jiang, Z.X. Wang, H.J. Su, X.C. Zhang, Y.P. Chen*. Exploring the influence of urban land use and morphology on diurnal heat variation: Insights from Travis, Texas. *Urban Informatics*, 2025.

Conference Papers

[1] **H. Chen**†, T. Han†, S.Y. Chen, Z.H. Guo, Y.P. Chen*, M.L. Wu*. Semantic4Safety: Causal insights from zero-shot street view imagery segmentation for urban road safety. *ACM SIGSPATIAL International Workshop on AI for Geographic Knowledge Discovery (GeoAI)*, 2025.

[2] C.S. Chen†, Y.C. Hou†, **H. Chen**†, J.L. Li, R. Fu, Q.S. Lai, Y.P. Chen*, T. Han*. GBA-UBF: A large-scale and fine-grained building function classification dataset in the Greater Bay Area. *ACM SIGSPATIAL Workshop on Spatial Big Data and AI for Industrial Applications (GeoIndustry)*, 2025.

[3] T. Han, **H. Chen**, C.L. Wang, Y.L. Ren, M.L. Wu. Towards a new era of geo-foundation models: Expert-guided multimodal alignment and geospatial context awareness. *ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*, 2025.

[4] C.L. Wang, **H. Chen**, J. Ma, T. Han, Y.P. Chen. VoxelFlow: 2D semantic mask-guided voxel flow for open-vocabulary 3D instance segmentation. *International Conference on Cyberworlds (Oral)*, 2025. (**Best Paper Honorable Mention Award**)

[5] S.Y. Chen, T. Han*, C.S. Zhang, X. Luo, **H. Chen**, M.L. Wu, G.R. Cai, J.H. Su*. LiDAR-DHMT: LiDAR-adaptive dual hierarchical mask transformer for robust freespace detection and semantic segmentation. *Winter Conference on Applications of Computer Vision (WACV)*, 2026.

Symbol Explanation: † Co-first Author * Corresponding Author

SUBMISSIONS & IN PREPARATION

[1] R.J. Fan, J.Y. Ye, **H.Chen**, Z.L. Huang, X.L. Wang, W.J. Li*. SatSAM2: Motion-Constrained Video Object Tracking in Satellite Imagery using Promptable SAM2 and Kalman Priors. *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2026. *(Under Review)*

[2] Y.F. Jiang; N. Wang; G.W. Liu*; T. Han; B.F. Bian; **H. Chen**; J. Liu. Scale-effect assessment of buildings exposure to land subsidence using SBAS-InSAR and interpretable machine learning model. *Natural Hazards*, 2025. *JCR Q1, IF=3.7. (Under Review)*

[3] **H. Chen**. First-author manuscript in preparation for submission to *Computers, Environment and Urban Systems* on evaluating urban walkability from street-view imagery through LLM and spatial analysis. *JCR Q1, IF=8.3*.

HONORS & AWARDS

Competitions

[1] **Grand Prize** — The 9th National LiDAR Conference Point Cloud Intelligent Analysis Competition.

[2] **Grand Prize** — The 8th National LiDAR Conference "HuaCe Cup" 3D Digital Base Data Processing Competition.

[3] **First Prize** — 22nd SuperMap Cup National College GIS Competition (Cartography Group).

[4] **First Prize** — 2024 Guangdong Provincial Mathematical Contest in Modeling for College Students.

[5] **Second Prize** — 16th National Mathematical Contest for College Students (Non-Mathematics Category A).

[6] **Excellence Award** — The 11th "Sharing Cup" Innovation Competition on Science and Technology Resource Sharing Service and 1st Earth System Science Professional Competition.

Scholarships

[1] **China National Scholarship**, Ministry of Education of the People's Republic of China (2024–2025).

[2] **First Prize** — Outstanding Student Scholarship, Sun Yat-sen University (2024–2025).

[3] **Second Prize** — Outstanding Student Scholarship, Sun Yat-sen University (2023–2024).

RESEARCH EXPERIENCE

Urban Heat Island Modeling based on Land Surface Temperature *Apr. 2025 – Aug. 2025*
Sun Yat-sen University | Advisor: Prof. Yiping Chen

- **Data Collection & Preprocessing:** Compiled and standardized multisource datasets including land use, building morphology, vegetation indices, and environmental indicators for Travis County, Texas.
- **Modeling & Spatial Analysis:** Implemented Geographical Detector and Geographically Weighted Regression (GWR) to identify key LST drivers, nonlinear interactions, and localized variations across day–night cycles.
- **Visualization & Interpretation:** Designed spatial heat maps and diurnal comparison figures to communicate the heterogeneity of urban heat responses and support planning-oriented interpretation.
- One paper accepted at *Urban Informatics*, 2025.

Causal Inference for Urban Streetscape Safety *Aug. 2025*
University of Glasgow | Advisor: Prof. Meiliu Wu *Remote*

- **Data Preparation & Indicator Design:** Collected and pre-processed street-view imagery and road network data; developed 11 interpretable streetscape indicators via zero-shot semantic segmentation, integrating road type as contextual information.

- **Causal Modeling Implementation:** Built and tuned a unified XGBoost–GPS pipeline to quantify heterogeneous causal effects of visual indicators on multi-class accident risks through propensity weighting and Average Treatment Effect (ATE) estimation.
- **Result Analysis & Visualization:** Applied SHAP for global and local interpretability, visualized risk factor contributions, and identified distinct accident-type-specific mechanisms for targeted safety interventions.
- One paper accepted at *ACM SIGSPATIAL GeoAI 2025*.

PROJECTS

Foundation Model-driven 3D Reconstruction of Urban Buildings from Point Clouds *Jan. 2026 – Dec. 2027*
Open Research Fund Project, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing

- Collected and cleaned large-scale urban LiDAR point cloud data to ensure geometric accuracy and completeness.
- Assisted in model optimization and fine-tuning for automated 3D building reconstruction tasks under foundation model frameworks.
- Contributed to improving reconstruction efficiency and reliability through iterative evaluation and algorithmic refinement.

Multimodal Urban Building Function Recognition for the Greater Bay Area *Dec. 2024 – Dec. 2025*
College Students' Innovation and Entrepreneurship Training Program (University Level), Sun Yat-sen University

- Participated in a university-level innovation project on large-scale multimodal urban building function recognition in the Greater Bay Area.
- Reproduced and improved baseline algorithms for multimodal feature fusion, enhancing classification accuracy and robustness.
- Collected, organized, and preprocessed multisource data including building footprints, POI distributions, and remote sensing imagery.

COMPETITIONS

3D Point Cloud Integration and Quality Assurance *Aug. 2024 – Aug. 2025*

- Led preprocessing and integration of large-scale airborne and terrestrial LiDAR datasets, ensuring coordinate consistency and noise filtering for downstream modeling.
- Developed standardized data pipelines for merging multi-source point clouds and generating voxelized representations to support 3D object detection tasks.
- Conducted manual inspection and statistical validation to guarantee geometric accuracy and label integrity prior to model training.
- Collaborated with algorithm engineers to evaluate model performance and optimize data–model alignment for domain adaptation experiments.

Cartographic Design and Data Visualization for Thematic Mapping *Jul. 2024 – Dec. 2024*

- Collected and processed geospatial datasets for thematic mapping and spatial visualization tasks.
- Designed and produced two key competition maps, including layout composition and cartographic symbolization.
- Contributed to data preprocessing, aesthetic refinement, and final presentation materials for submission.
- Contributed to the team awarded **First Prize**, 2024.

SKILLS

Language: English(CET-6), Chinese(Native)
Programming: Python, PyTorch, scikit-learn, MATLAB, C/C++
Tools: ArcGIS, Git, Linux, LaTeX, CloudCompare