

Tianyang Chen

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WORK EXPERIENCE:

Research/Teaching Assistant, 2018 – 2024

University of North Carolina at Charlotte, Charlotte, NC, U.S

Teaching Assistant, 2015 – 2017

Eastern Michigan University, Ypsilanti, MI, U.S.

EDUCATION:

Doctor of Philosophy in Geography, 2018 – 2024

University of North Carolina at Charlotte, Charlotte, U.S

Master of Science in Geographic Information Science, 2015 – 2017

Eastern Michigan University, Ypsilanti, U.S.

Bachelor of Engineering in surveying and Mapping, 2010 – 2014

Hebei University of Engineering, Handan, China

PUBLICATIONS:

1. Tang, W., **Chen, T.**, and Armstrong, M. (2024) GPU-accelerated Parallel All-Pair Shortest Path Routing Within Stochastic Road Networks. *International Journal of Geographic Information Science*, 1-33.
<https://doi.org/10.1080/13658816.2024.2394651>
2. **Chen, T.**, Tang, W., Allan, C., and Chen., S. (2024). Explicit Incorporation of Spatial Autocorrelation in 3D Deep Learning for Geospatial Object Detection. *Annals of American Association of Geographers*. 1-20.
<https://doi.org/10.1080/24694452.2024.2380898>
3. Tang, W., Hearne, H. S., Slocum, Z., & **Chen, T.** (2023). GIS-Based Scientific Workflows for Automated Spatially Driven Sea Level Rise Modeling. *Sustainability*, 15(17), 12704.
<https://doi.org/10.3390/su151712704>
4. Liu, C., Liu, C., Sun, Q., **Chen, T.**, & Fan, Y. (2022). Vegetation Dynamics and Climate from A Perspective of Lag-Effect: A Study Case in Loess Plateau, China. *Sustainability*, 14(19), 12450.
<https://doi.org/10.3390/su141912450>
5. Sun, Q., Liu, C., **Chen, T.**, Zhang, A., Liu, C., & Tao, Y. (2022). Adaptive Decomposition and Multitimescale Analysis of Long Time Series of Climatic Factors and Vegetation Index Based on ICEEMDAN-SVM. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 15, 6203-6219.
<https://doi.org/10.1109/JSTARS.2022.3194987>
6. Chavan, V. S., Chen, S. E., Shanmugam, N. S., Tang, W., Diemer, J., Allan, C., Braxtan, N., Shukla, T., **Chen, T.**, & Slocum, Z. (2022). Modeling of Progressive Scouring of a Pier-on-Bank. *CivilEng*, 3(2), 365-384.
<https://doi.org/10.3390/civileng3020022>
7. Chavan, V. S., Chen, S. E., Shanmugam, N. S., Tang, W., Diemer, J., Allan, C., Braxtan, N., Shukla, T., **Chen, T.**, & Slocum, Z. (2022). An analysis of local and combined

- (global) scours on piers-on-bank bridges. *CivilEng*, 3(1), 1-20.
<https://doi.org/10.3390/civileng3010001>
8. Tang, W., **Chen, T.**, Slocum, Z., Lan, Y., Delmelle, E., Chen, D., ... & Gibas, C. (2022). A web-based spatial decision support system of wastewater surveillance for COVID-19 monitoring: a case study of a university campus. *medRxiv*, 2021-12.
<https://doi.org/10.1101/2021.12.29.21268516>
 9. Sun, Q., Liu, C., **Chen, T.**, & Zhang, A. (2021). A weighted-time-lag method to detect lag vegetation response to climate variation: A case study in Loess Plateau, China, 1982–2013. *Remote Sensing*, 13(5), 923.
<https://doi.org/10.3390/rs13050923>
 10. Tao, Y., Liu, C., **Chen, T.**, Zhao, X., Liu, C., Hu, H., ... & Xin, H. (2021). Real-time multipath mitigation in multi-GNSS short baseline positioning via CNN-LSTM method. *Mathematical Problems in Engineering*, 2021, 1-12.
<https://doi.org/10.1155/2021/6573230>
 11. Sun, Q., Liu, C., **Chen, T.**, & Zhang, A. (2021). A weighted-time-lag method to detect lag vegetation response to climate variation: A case study in Loess Plateau, China, 1982–2013. *Remote Sensing*, 13(5), 923.
<https://doi.org/10.3390/rs13050923>
 12. Zheng, M., Tang, W., Ogundiran, A., **Chen, T.**, & Yang, J. (2020). Parallel landscape visibility analysis: A case study in archaeology. In *High Performance Computing for Geospatial Applications* (pp. 77-96). Springer, Cham.
https://doi.org/10.1007/978-3-030-47998-5_5
 13. Zeng, J., **Chen, T.**, Yao, X., & Chen, W. (2020). Do Protected Areas Improve Ecosystem Services? A Case Study of Hoh Xil Nature Reserve in Qinghai-Tibetan Plateau. *Remote Sensing*, 12(3), 471.
<https://doi.org/10.3390/rs12030471>
 14. Yang, J., Liu, C., **Chen, T.**, & Zhang, Y. (2019). The invasive weed optimization-based inversion of parameters in probability integral model. *Arabian Journal of Geosciences*, 12(14), 424.
<https://doi.org/10.1007/s12517-019-4592-9>
 15. **Chen, T.**, Xie, Y., Liu, C., Bai, Y., Zhang, A., Mao, L., & Fan, S. (2018). Trend Analysis of Relationship between Primary Productivity, Precipitation and Temperature in Inner Mongolia. *ISPRS International Journal of Geo-Information*, 7(6), 214.
<https://doi.org/10.3390/ijgi7060214>
 16. Zhang, A., **Chen, T.**, Liu, X., & Yang, Y. (2015). "Monitoring Data Filter and Deformation Information Extraction Based on Wavelet Filter and Empirical Mode Decomposition". *Applied Mechanics and Materials*, Vol. 742, pp. 261-271, 2015.
<https://doi.org/10.4028/www.scientific.net/AMM.742.261>

Publication in Progress

1. **Chen, T.**, Tang, W., Allan, C., and Chen., S. (2024). Spatial Autocorrelation Encoder for 3D Deep Learning of Geospatial Object Detection (Submitted for review). *International Journal of Digital Earth*.
2. **Chen, T.**, Tang, W., Allan, C., and Chen., S. 3D Geospatial Object Detection: A Case Study on Hydraulic Structures.

Dissertation/Thesis:

1. **Chen, T.** (2024). Spatially Context-Aware 3D Deep Learning for Geospatial Object Detection (Doctoral dissertation, The University of North Carolina at Charlotte).

PROJECT REPORT:

1. Tang, W., Chen, S. E., Diemer, J., Allan, C., **Chen, T.**, Slocum, Z., ... & Shanmugam, N. S. (2022). *DeepHyd: A Deep Learning-based Artificial Intelligence Approach for the Automated Classification of Hydraulic Structures from LiDAR and Sonar Data* (No. FHWA/NC/2019-03). North Carolina Department of Transportation. Research and Development Unit.

CONFERENCE PRESENTATIONS (as presenter):

1. **Chen, T.**, Tang, W. Considering spatial dependency of predicted labels in deep learning-based 3D object detection. American Association of Geographers Annual Meeting 2024. April 16-20, 2024.
2. **Chen, T.**, Tang, W. Deep learning on 3D point cloud: an exploratory experiment in incorporating spatial-related features. American Association of Geographers Annual Meeting 2023. March 23, 2023.
3. **Chen, T.**, Tang, W., Chen, S., Allan, C., Diemer, J., Shukla, T., Slocum, Z., Shanmugam, N., Chavan, V., and Lauffer, M.S. 2022. Empirical knowledge related to deep learning-based 3D point cloud classification in 3D GIS. American Association of Geographers Annual Meeting 2022, February 25 to March 1, 2022
4. **Chen, T.**, Tang, W., Chen, S., Allan, C., Diemer, J., Shukla, T., Slocum, Z., Shanmugam, N., Chavan, V., and Lauffer, M.S. 2022. Evaluation of 3D deep learning-based classifiers using pseudo-LiDAR data from 3D video games. The Applied Geography Conference. October 20-22, 2022. (Virtual)
5. **Chen, T.**, Tang, W., Chen, S., Allan, C., Diemer, J., Shukla, T., Shanmugam, N., Chavan, V., Lauffer, M.S. 2021. Deep learning-based 3D semantic segmentation: a practical case in hydraulic structures, Annual Meeting of the American Association of Geographers, Virtual Conference., April 7th, 2021.
6. **Chen, T.**, Tang, W., Chen, S., Allan, C., Diemer, J., Shukla, T., Shanmugam, N., Chavan, V., Lauffer, M.S. 2021. Automated semantic segmentation of point cloud data driven by deep learning and 3D GIS. NCDOT Research & Innovation Summit 2.0. Virtual. October 5-6, 2021.
7. **Chen, T.**, Tang, W., Chen, S., Allan, C., Diemer, J., Shukla, T., Slocum, Z., Shanmugam, N., Chavan, V., and Lauffer, M.S., 2020. 3D Point Cloud Semantic Segmentation: A practical case in bridge detection. USGIF GEOINTEGRATION Summit, September 28th, 2020
8. **Chen, T.**, Tang, W., Chen, S., Chavan, V., Shanmugam, N., Slocum, Z., Shukla, T., Allan, C., Diemer, J., and Lauffer, M.S., 2020. Deep Learning-based Semantic Segmentation of 3D Point Clouds: A Case Study for Hydraulic Structures and its components. NCDOT Research & Innovation Virtual Summit, October 13th-14th, 2020.
9. **Chen, T.**, A case study to evaluate clusterODM toolkit for unmanned aerial vehicle mapping. GIS Day Lighting Talk, November 13th, 2019, Charlotte, NC.
10. **Chen, T.**, Tang, W., Chen, S., Allan, C., Diemer, J., Shukla, T., Shanmugam, N., Chavan, V., Lauffer, M.S., Massive 3D scene reconstruction of hydraulic structures accelerated using high-performance computing. NCDOT Research & Innovation Summit, May 7th, 2019, Greensboro, NC.
11. **Chen, T.**, and Tang, W., When geospatial big data meets high performance computing in 3D GIS. Annual Meeting of the American Association of Geographers, Washington D.C., April 3rd-7th, 2019
12. **Chen, T.**, and Xie, Y., Trend Analysis of relationship between Primary Productivity, Precipitation and Temperature in Inner Mongolia. Association of American Geographers Annual Meeting, New Orleans, LA, 2018
13. **Chen, T.**, and Liu, C., A new weighted method in detecting the time lag of climate

factors impacting on vegetation communities. East Lakes Division of the American Association of Geographers Annual Meeting, Ypsilanti, October 12th-13th, 2017.

14. **Chen, T.**, and Xie, Y., Vegetation response to climate in long time series in Inner Mongolia, China, using Empirical Mode Decomposition. Fourth International Joint Conference Geo-informatics in Sustainable Ecosystem and Society. Ypsilanti, October 8th-9th, 2016.

TEACHING ACTIVITIES

Year (semester)	Role	Class Name (# students)	Location
2023 (Fall)	Instructor of Record	Web GIS (11)	UNCC
2024 (Fall)	Invited Lecturer	Web GIS (21)	UNCC

PROFESSIONAL SERVICES

Manuscript Reviews since 2018 (18 manuscripts; 9 journals)

1. 7 manuscripts for *Socio-Ecological Practice Research*.
2. 4 manuscripts for *Remote sensing*
3. 1 manuscript for *Cartography and geographic information science*.
4. 1 manuscript for *Environmental monitoring and assessment*.
5. 1 manuscript for *PLOS one*.
6. 1 manuscript for *Cluster Computing*
7. 1 manuscript for *Scientific reports*.
8. 1 manuscript for *Theoretical and applied climatology*.
9. 1 manuscript for *Land*

RECOGNITION AND AWARDS

- 2024 Travel award for 2024 Geospatial Cyberinfrastructure Workshop: Building High-Performance, Ethical, and Secured Geospatial Software, Honolulu, HI
- 2020 Graduate School's Proposal Development Summer Fellowship at University of North Carolina at Charlotte, Charlotte, NC
- 2019 Travel award for San Diego Supercomputer Center Summer Institute, San Diego, CA
- 2017 Presentation award for master program at Annual Meeting of East Lakes Division of the American Association of Geographers, Ypsilanti, MI

ORGANIZATIONS

- 2021 – 2023 Chinese Students and Scholars Association at University of North Carolina at Charlotte
- 2022 – 2023 Expanding Your Horizons Charlotte Chapter at University of North Carolina at Charlotte