

Farahnaz Hosseini

Venice, Florida, USA | 940-331-4666 | farahnazhosseini@my.unt.edu

LinkedIn: Farahnaz Hosseini | Google Scholar: <https://scholar.google.com/citations?user=l3Qfe2UAAAAJ&hl=en>

RESEARCH PROFILE

Computer science Ph.D. researcher with expertise in artificial intelligence, graph neural networks, high-performance computing, dynamic graph algorithms, and data science. Research focuses on graph-based socioeconomic modeling from high-dimensional census data, scalable algorithms for large dynamic networks, and AI applications in biomedical, financial, and social-data domains. Experienced in research publication, teaching, mentoring, proposal support, and interdisciplinary collaboration.

EDUCATION

Ph.D. in Computer Science

University of North Texas (UNT) | May 2026

Dissertation: Graph Neural Networks for Neighborhood Socioeconomic Modeling from High-Dimensional Census Data

Advisor: Dr. Ting Xiao

M.S. in Computer Engineering

University of Kashan | September 2012 - June 2014

Thesis: Brain Tumor Detection and Recognition in MRI Images

Advisor: Dr. Hossein Ebrahimpour Komleh

B.S. in Computer Engineering

Kerman Higher Institute | September 2008 - June 2010

Associate Degree in Computer Hardware

Kharazmi Applied-Scientific Higher Education Institute, Tiran and Karvan Branch | September 2004 - September 2008

RESEARCH INTERESTS

- Artificial intelligence; machine learning and deep learning
- Graph neural networks and graph-based representation learning
- Vector embeddings for AI applications and geo-embedded data
- Multimodal large language models and LLMOps
- Clinical and biomedical applications of AI
- Big data, data science, high-performance computing, and cybersecurity

SELECTED TECHNICAL SKILLS

Programming and data analysis: Python, C++, SQL, Pandas, NumPy, scikit-learn, Jupyter, Git, Linux

AI and machine learning: PyTorch, TensorFlow/Keras, PyTorch Geometric, graph neural networks, GCN, GraphSAGE, GAT, transformers, LLMOps

High-performance computing: OpenMP, MPI, CUDA, parallel graph algorithms, dynamic graph analytics

Visualization and analytics: Matplotlib, Plotly, Tableau, Power BI, D3.js

Cloud and data platforms: AWS, Azure, Databricks, data engineering workflows

SELECTED PUBLICATIONS

(20+ publications; 52+ citations; h-index: 5)

1. Hosseini, F., and T. Xiao. 2026. "Graph Neural Networks and Geo-Embedded Census Data for Socioeconomic Prediction: A Comprehensive Review." *Academia AI and Applications Journal*.
2. Hosseini, F., and T. Xiao. 2026. "Robust Socioeconomic Community Discovery from Census-Derived Indicators via KNN Graphs and Louvain Stability-Conductance Analysis." *IEEE SoutheastCon 2026*, Huntsville, Alabama, USA.
3. Hosseini, F., and T. Xiao. 2025. "Discovering Socioeconomic Structure with Unsupervised Graph Neural Embeddings on Census Data." *12th Annual Conference on Computational Science & Computational Intelligence (CSCI 2025)*, Las Vegas, USA.
4. Hosseini, F., and T. Xiao. 2025. "Graph-Augmented Machine Learning for Socioeconomic Prediction Using Census Data." *12th Annual Conference on Computational Science & Computational Intelligence (CSCI 2025)*, Las Vegas, USA.
5. Hosseini, F., and T. Xiao. 2025. "Using Dynamic Graph Neural Networks for Temporal Analysis in Financial Markets." *4th International Conference on Computing and Machine Intelligence (CMI 2025)*, Michigan, USA.
6. Nickfarjam, A. M., M. Dalilian, S. A. Zargari, M. Farzandipour, F. Hosseini, and T. Xiao. 2025. "Comparison of Deep Learning Methods for Age Determination in Forensic Clients Aged 5-18 Years." *4th International Conference on Computing and Machine Intelligence (CMI 2025)*, Michigan, USA.
7. Nickfarjam, A. M., F. Hosseini, Z. S. Kia, L. Shokrizadeh Arani, and T. Xiao. 2025. "White Blood Cell Detection and Counting Using PSO." *Studies in Health Technology and Informatics* 328:332-336. doi: 10.3233/SHTI250731. PMID: 40588938.

8. Nickfarjam, A. M., F. Hosseini, and T. Xiao. 2025. "White Blood Cell Detection and Counting Using Particle Swarm Optimization." 23rd International Conference on Informatics, Management, and Technology in Healthcare.
9. Hosseini, F., and T. Xiao. 2025. "Developing K-Core and K-Truss Algorithms in Large Dynamic Graphs." Proceedings of the SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, Texas, USA.
10. Khanda, A., S. M. Shovan, A. Pandey, F. Hosseini, and S. K. Das. 2024. "Efficient Approaches to Analyzing Large Dynamic Networks." Proceedings of SC24: The International Conference for High Performance Computing, Networking, Storage, and Analysis, Atlanta, Georgia, USA.
11. Biglari, S., F. Hosseini, A. Upadhyay, and H. Zhao. 2024. "Survey of Network-on-Chip (NoC) for Heterogeneous Multicore Systems." Proceedings of the 17th IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoc 2024).
12. Bevara, R. V. K., I. Wagenvoord, F. Hosseini, H. Sharma, V. Nunna, and T. Xiao. 2024. "Census2Vec: Enhancing Socioeconomic Predictive Models with Geo-Embedded Data." Proceedings of the Intelligent Systems Conference (IntelliSys 2024), 626-640. Springer Nature.
13. Rafati, M., N. Kalantari, J. Azadbakht, A. M. Nickfarjam, and F. Hosseini. 2024. "Performance Evaluation of Fuzzy Genetic, Fuzzy Particle Swarm and Similar Insects Optimization Algorithms on Denoising Problem Based on a Novel Combined Filter for Digital X-ray Images." Multimedia Tools and Applications 83(6):15483-15531.
14. Zarei, M. A., F. Hosseini, A. M. Nickfarjam, and T. Xiao. 2023. "Predicting User Interest Using Hierarchical-Based Clustering for Recommender Systems." Proceedings of the International Conference of Computer Science and Information Technology (ICCSIT 2023).
15. Bevara, R. V. K., T. Xiao, and F. Hosseini. 2023. "Bias Analysis in Language Models Using an Association Test and Prompt Engineering." Proceedings of the 2023 IEEE International Conference on Software Quality, Reliability & Security (QRS 2023).
16. Rafati, M., F. Farnia, E. Romoozi, A. M. Nickfarjam, and F. Hosseini. 2021. "Measuring Panoramic Radiomorphometric Indices for Mandible Bone Using Active Shape Model and BIC-SVM." International Journal of Imaging Systems and Technology 31(3):1711-1730.
17. Nickfarjam, A. M., H. Ebrahimpour-Komleh, and F. Hosseini. 2015. "Multi-level Image Thresholding Based on Local Variance and Particle Swarm Optimization." Proceedings of the International Congress on Technology, Communication and Knowledge (ICTCK 2015).
18. Hosseini, F., H. Ebrahimpour-Komleh, and M. KhodamHazrati. 2015. "Quantitative Evaluation of Skull Stripping Techniques on Magnetic Resonance Images." Proceedings of the World Congress on Electrical Engineering and Computer Systems and Science (EECSS 2015).
19. Askari, M., H. Ebrahimpour, A. A. Bidgoli, and F. Hosseini. 2013. "Parallel GPU Implementation of Hough Transform for Circles." International Journal of Computer Science Issues 10(2):215-221.

RESEARCH EXPERIENCE

Graduate Research Assistant

University of North Texas | Denton, Texas, USA | January 2022 - May 2025

- Conducted NSF-funded research on scalable k-core and k-truss decomposition algorithms for large dynamic graphs using high-performance computing methods.
- Developed graph-based and deep learning methods for socioeconomic predictive modeling using graph neural networks and multi-source data.
- Designed and evaluated machine learning and graph learning pipelines for large-scale data analysis, representation learning, and predictive modeling.
- Collaborated on research outputs in high-performance computing, census-based socioeconomic modeling, dynamic graphs, and biomedical AI applications.

TEACHING EXPERIENCE

Graduate Teaching Assistant

University of North Texas | Denton, Texas, USA | May 2025 - May 2026

- Supported instruction in Social Issues in Computing and Data Visualization courses.
- Assisted students with hands-on projects using Python, Matplotlib, Plotly, Tableau, Power BI, and D3.js.
- Contributed to grading, feedback, tutorial support, and student guidance for technical course projects.

Computer Engineering Instructor and Lecturer

Payame Noor University | January 2015 - May 2015

- Taught Artificial Intelligence and Research Methods courses.
- Developed course materials, assessments, and instructional content.
- Supervised undergraduate student projects and provided academic guidance.

Instructor

Technical and Professional Organization | August 2007 - 2020

- Taught programming languages, web development, software engineering, database systems, operating systems, networking and security, and software tools.
- Delivered lectures, prepared instructional materials, and evaluated student performance through exams and projects.

- Provided detailed feedback and supported student skill development across technical and applied computing topics.

ADVISING AND MENTORING EXPERIENCE

Academic Mentor

UR2PhD Program, Computing Research Association

- Mentored undergraduate students in research methods, graduate school preparation, parallel programming, CUDA, OpenMP, and graph algorithms.

Graduate Advisor

UNT AI Summer Research Program / AI Lab Summer Program | 2023 - Present

- Advised students on AI and data science summer research projects, including project planning, technical development, and academic guidance.

PROPOSAL AND GRANT WRITING SUPPORT

- Contributed to the development and writing of research proposals and supporting documents for grant applications in AI, machine learning, and data science.
- Assisted with technical writing, literature synthesis, and proposal preparation for funded and seed-grant research projects.

AWARDS, HONORS, GRANTS, AND ACADEMIC SERVICE

- Toulouse Graduate School Grant, University of North Texas, 2025.
- Department of Computer Science and Engineering Grant, University of North Texas, 2025.
- CSCE Grant, University of North Texas, 2025.
- ACM SIGHPC Grant Recipient, Supercomputing 2024 (SC24), Atlanta, Georgia, USA, 2024.
- Student Volunteer, Supercomputing 2023 (SC23), Denver, Colorado, USA, 2023.
- Student Volunteer, Supercomputing 2022 (SC22), Dallas, Texas, USA, 2022.
- Undergraduate Mentor, Computing Research Association (CRA) UR2PhD Program, 2023-2024; mentored two undergraduate students on research projects involving algorithms for large-scale dynamic graphs.
- Top Graduating Student, Department of Computer Engineering, University of Kashan.
- Thesis recognized in written media as a successful joint collaboration with the University of Florida in brain tumor detection and recognition using MRI.
- Top 25% worldwide ranking, KDD Cup 2013 Author Disambiguation Challenge, Track 2.
- Certificate of Achievement, ACM International Collegiate Programming Contest (ICPC), Asia Tehran Regional, 2006.
- Certificate of Achievement, 6th Place, ACM International Collegiate Programming Contest, Asia Tehran Regional, 2013.

ORAL PRESENTATIONS AND POSTERS

1. Hosseini, F. 2025. "Developing k-core and k-truss algorithms in large dynamic graphs." Oral presentation, SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, TX.
2. Pandey, A., Khanda, S., Shovan, F. M., Hosseini, F., Das, S., Norris, B., and Bhowmick, S. 2024. "Efficient approaches to analyzing large dynamic networks." Poster presentation, International Conference for High Performance Computing, Networking, Storage, and Analysis (SC24).
3. Pandey, A., Khanda, S., Srinivasan, S., Srinivasan, S., Shovan, F. M., Hosseini, F., Das, S., Norris, B., and Bhowmick, S. 2023. "Scalable algorithms for analyzing large dynamic networks using CANDY." Poster presentation, International Conference for High Performance Computing, Networking, Storage, and Analysis (SC23).
4. Hosseini, F., Ebrahimpourkomleh, H., and Nikfarjam, A. M. 2014. "Image segmentation using pixel mapping to a new space." National Conference on Science and Computer Engineering, Najaf Abad. Paper No. 1245.
5. Hosseini, F., Ebrahimpourkomleh, H., and Nikfarjam, A. M. 2014. "Large intestine cancer data evaluation and classification." 2nd Conference on Computer and Information Technology, Tabriz.
6. Hosseini, F., Rezaee, Z., and AzimiKashani, A. 2014. "Real-time data processing in wireless sensor networks." National Conference on Computer Engineering and Information Technology, Shoushtar. Paper No. 54327.322.
7. Hosseini, F., Ebrahimpourkomleh, H., and Askari, M. 2014. "A novel method with high accuracy for signature detection using PCA algorithm." 4th International Conference on Information Technology Management, Communication and Computer (MITC2014), Tehran. Paper No. 93.104.214.
8. Hosseini, F., Ebrahimpourkomleh, H., and Askari, S. 2014. "A novel method for iris recognition using BP neural network and parallel computing with the aid of GPU." 4th International Conference on Information Technology Management, Communication and Computer (MITC2014), Tehran. Paper No. 93.104.214.
9. Nikfarjam, A. M., Ebrahimpourkomleh, H., and Hosseini, F. 2014. "Multi-level image thresholding based on local variance and particle swarm optimization." 2nd International Conference on Intelligent Information Systems and Complex Systems, Mashhad. Paper No. 52.

PROFESSIONAL AND UNIVERSITY SERVICE

- Member, Association for Computing Machinery (ACM), 2022-Present.

- Member, Institute of Electrical and Electronics Engineers (IEEE), 2021-Present.
- Member, Computing Research Association (CRA), 2023-Present.
- Member, AnitaB.org, 2022-Present.
- Member, Women in HPC (WHPC), 2024-Present.
- Graduate Advisor, UNT AI Summer Research Program, 2023-Present.

BOOK CHAPTER TRANSLATION

- Translated one chapter of Probabilistic Robotics by Sebastian Thrun, ISBN-13: 978-0262201629, 2013.

CERTIFICATES

- Google Cybersecurity Professional Certificate, Google.
- Google AI Essentials Professional Certificate, Google.
- Introduction to LLMops with Azure, Duke University.
- Open Source LLMops Solutions, Duke University.
- Developing on AWS for AI, Duke University.
- Large Language Model Operations (LLMOps) Specialization, Duke University.
- GenAI and LLMs on AWS, Duke University.
- Advanced Data Engineering, Duke University.
- Databricks to Local LLMs, Duke University.
- Certificate of Achievement, ACM International Collegiate Programming Contest, Asia Tehran Regional, 2009.
- Certificate of Achievement, ACM International Collegiate Programming Contest, Asia Tehran Regional, 2013.
- Workshop, MITC 2014 International Conference on Information Technology Management, Communication and Computer, 2014.

REFERENCES

Dr. Ting Xiao

Assistant Professor, Department of Data Science
University of North Texas
1155 Union Circle #311366, Denton, TX 76203-5017, USA
Email: Ting.Xiao@unt.edu

Dr. Mohsen Amini Salehi

Associate Professor, Department of Computer Science and Engineering
University of North Texas
1155 Union Circle #311366, Denton, TX 76203-5017, USA
Email: Mohsen.Aminisalehi@unt.edu

Dr. Hui Zhao

Associate Professor, Department of Computer Science and Information Systems
University of North Texas
1155 Union Circle #311366, Denton, TX 76203-5017, USA
Email: Hui.Zhao@unt.edu