

Frank (Sicong) Chen

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Google Scholar

PROFESSIONAL EXPERIENCE

- **Dartmouth College** Hanover, NH
Research Associate — Supervisor: Prof. Tam Vu (Distinguished Professor) *July 2025 – Present*
 - Conducting and leading interdisciplinary research on the use of wearable systems and artificial intelligence to improve human healthcare outcomes.
 - Leading multiple applied, system-oriented research projects, including:
 - A closed-loop nightmare detection and intervention system for veterans and individuals with PTSD using wearable sensing and AI models.
 - A wearable-based AI assistant to support people with dementia and their caregivers in daily life.
 - Brain organoid-related research involving integrated hardware–software system development in close collaboration with biology, chemistry, mechanical engineering, and electrical engineering researchers.
 - Advancing multiple ongoing research thrusts initiated during doctoral training and further developed during postdoctoral research, including:
 - Transformer-based Parkinson’s disease diagnosis from motion sensor–based gait data.
 - Resilient wearable-based continuous stress monitoring in everyday settings.
 - Security and robustness analysis of palm-based biometric authentication systems under adversarial noise.
 - Designing and implementing end-to-end research systems spanning sensing hardware, mobile and wearable software (iOS and WearOS), and AI/ML pipelines.
 - Collaborating with multidisciplinary teams across academic, clinical, and government institutions, including academic medical centers and VA-affiliated healthcare systems (e.g., National Center for PTSD), to translate AI and wearable research into real-world healthcare applications.
- **NSF Proposal Drafting and Collaboration** *2024 - 2026*
 - Contributed to the preparation of multiple NSF research proposals in collaboration with faculty advisors, PIs, and multi-institutional research teams.
 - Collaborated with Prof. Vir Phoha and research groups from Texas A&M University and Florida International University on technical concept development, evaluation planning, and broader impact components.
 - Supported proposal preparation during postdoctoral training by assisting with technical illustrations, system diagrams, and proposal organization in collaboration with the supervising PI (Prof. Tam Vu) and research teams from Columbia University and University of Texas at Austin.

EDUCATION

- **Syracuse University** Syracuse, NY
Ph.D. in Computer and Information Science and Engineering *Aug 2020 - June 2025*
Advisor: Prof. Vir Phoha
Dissertation: Enhancing security and healthcare through continuous monitoring on wearable devices
- **Syracuse University** Syracuse, NY
M.S. in Computer Science *Aug 2018 - May 2020*
- **Tianjin University** Tianjin, China
B.S. in Mathematics and Applied Mathematics *Sep 2013 - July 2017*

PUBLICATIONS

Journal Articles (Peer-Reviewed)

- **Chen, Frank Sicong**, Amith K Belman, and Pronab Mohanty. Accelerometer-based gait user authentication using features extracted from the swing phase. *IEEE MultiMedia*, 2025. in press
- **Chen, Frank Sicong**, Jingyu Xin, and Vir V. Phoha. Sspra: A robust approach to continuous authentication amidst real-world adversarial challenges. *IEEE Transactions on Biometrics, Behavior, and Identity Science*, 6(2):245–260, 2024

Conference Papers (Peer-Reviewed)

- **Chen, Frank Sicong**, Shruti Rao, Brijesh Tiwari, and Vir V Phoha. Dster: A dual-stream transformer-based emotion recognition model through keystrokes dynamics. In *2024 IEEE International Joint Conference on Biometrics (IJCB)*. IEEE, 2024 [**Recognized as a best-reviewed paper and invited for an extended journal version.**]
- Jiajing Chen, Huantao Ren, **Chen, Frank Sicong**, Senem Velipasalar, and Vir V Phoha. Gaitpoint: A gait recognition network based on point cloud analysis. In *2022 IEEE International Conference on Image Processing (ICIP)*, pages 1916–1920. IEEE, 2022
- Liangfu Lu, Zhenzhai Huan, Xuyun Zhang, Lianyong Qi, **Chen, Sicong**, and Yao Wu. Collaborative network traffic analysis via alternating direction method of multipliers. In *2018 IEEE 22nd International Conference on Computer Supported Cooperative Work in Design ((CSCWD))*, pages 547–552. IEEE, 2018

Book Chapters

- Amith K. Belman, **Chen, Frank Sicong**, Vir V. Phoha, and Pronab Mohanty. Beyond normality: Rethinking behavioral biometric data. In *AI-Enabled Forensic Investigations in Digital Sciences*. Springer, 2025. In press

Datasets and Research Resources

- Diksha Shukla, **Chen, Sicong**, Yao Lu, Partha Pratim Kundu, Ravichandra Malapati, Sujit Poudel, Zhanpeng Jin, and Vir Phoha. Brain signals and the corresponding hand movement signals dataset (bs-hms-dataset), 2019

Preprints

- **Chen, Frank Sicong**, Amith K Belman, and Vir V Phoha. Formalizing pqrst complex in accelerometer-based gait cycle for authentication. *arXiv preprint arXiv:2205.07108*, 2022

Manuscripts in Preparation

- **Chen, Frank Sicong**, Tam Vu, Zhou Xia, and Yuval Neria. Calmnight: A wearable-based closed-loop system for nightmare detection and intervention in veterans with ptsd. Manuscript in preparation for submission to *npj Digital Medicine*, 2026
- **Chen, Frank Sicong**, Tam Vu, and Sarah Preum. Memorii: A wearable-based ai assistant for supporting people with dementia and their caregivers. Manuscript in preparation for submission to *npj Digital Medicine*, 2026
- **Chen, Frank Sicong**, Tam Vu, Zhou Xia, and Yuval Neria. Understand your nightmares: A large-scale wearable-based dataset for nightmares in home settings. Manuscript in preparation for submission to *Scientific Data*, 2026

CONFERENCE PRESENTATIONS

- *DSTER: A Dual-Stream Transformer-based Emotion Recognition Model through Keystrokes Dynamics* Full paper and poster presentation at the IEEE International Joint Conference on Biometrics (IJCB 2024)
- *SSPRA: A Robust Approach to Continuous Authentication Amidst Real-World Adversarial Challenges* Full paper and poster presentation at the IEEE International Joint Conference on Biometrics (IJCB 2024)

HONORS AND AWARDS

- Best-Reviewed Paper Selection and Journal Invitation, *IEEE International Joint Conference on Biometrics (IJCB)*, 2024.
- Doctoral Consortium Travel Scholarship, *IEEE International Joint Conference on Biometrics (IJCB)*, 2024.
- Graduate Dean’s Award for Excellence in Research and Creative Work, Syracuse University, 2025.
- Summer Dissertation Fellowship, Syracuse University, 2024.
- Engineering and Computer Science Research Day Award (First Place), Syracuse University, 2025.
- University-wide Outstanding Teaching Assistant Award, Syracuse University, 2023.

PROFESSIONAL SERVICE

Journal Editorial and Review Service

- Program Committee Member, *IEEE Transactions on Computational Social Systems*
- Reviewer, *ACM Digital Threats: Research and Practice*

Conference Program Committees and Reviewing

- Program Committee Member, *IEEE International Conference on Automatic Face and Gesture Recognition (FG 2026)*
- Program Committee Member, *AAAI Conference on Artificial Intelligence (AAAI 2026)*
- Program Committee Member, *IEEE International Conference on Cognitive Machine Intelligence (CogMI 2025)*
- Reviewer, *International Conference on Computer Analysis of Images and Patterns (CAIP 2025)*
- Reviewer, *InterID Workshop, IEEE International Conference on Automatic Face and Gesture Recognition (FG 2025)*

TEACHING EXPERIENCE

- **Graduate Teaching Assistant** Syracuse, NY
2020 - 2025
 - CIS 735: Machine Learning for Security (Graduate-level)
 - Delivered independent lectures on neural networks, outlier detection, and model evaluation; mentored graduate students on research projects, including one leading to a peer-reviewed conference publication (IJCB 2024).
 - CIS 600/700: Biometrics (Graduate-level)
 - Developed and delivered instructional modules on AI-driven biometric systems, including keystroke dynamics, gait recognition, face recognition, and wearable-based body interfaces; supervised student course projects.
 - CIS 454: Software Implementation (Undergraduate-level)
 - Guided undergraduate students in software design and implementation projects, emphasizing best practices in software engineering.
 - CIS 375: Introduction to Discrete Mathematics (Undergraduate-level)
 - Conducted recitation sessions and instructional support for core discrete mathematics concepts.