# Xiaohui Liang

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## Education

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| Ph.D | Computer Engineering | University of Waterloo | 2013 |
| M.S. | Computer Science | Shanghai Jiao Tong University | 2009 |
| B.S. | Computer Science | Shanghai Jiao Tong University | 2006 |

## Positions

*University of Massachusetts Boston*

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| 2023- | Associate Chair, Department of Computer Science |
| Fall 2023 & Spring 2025 | Interim Chair, Department of Computer Science |
| 2021- | Associate Professor, Department of Computer Science |
| 2015-2021 | Assistant Professor, Department of Computer Science |

*Dartmouth College*

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| 2014-2015 | Postdoctoral Researcher, Department of Computer Science |

## Executive Summary

Xiaohui Liang is an Associate Professor with the Department of Computer Science at the University of Massachusetts, Boston (UMB). He was a Postdoctoral Researcher with Prof. David Kotz at Dartmouth College in 2014-2015. He received a Ph.D. degree in Computer Engineering from the University of Waterloo in 2013, with an award of Outstanding Achievement in Graduate Studies, under the supervision of Prof. Sherman Shen and Prof. Xiaodong Lin. He received the BSc and MSc degrees in Computer Science from Shanghai Jiao Tong University, China, in 2006 and 2009, respectively. His research interests include mobile health, mobile systems, speech and language processing, and network security. He received the Early Career Research Excellence Award from UMass Boston College of Science and Mathematics in 2020, the Early Career Award for Excellence in Scalable Computing from IEEE Technical Committee on Scalable Computing in 2017, the Best Land Transportation Paper Award from IEEE Vehicular Technology Society in 2017, the Internet of Things Technology Research Award from Google in 2016, and the Best Paper Awards in BodyNets 2010, IEEE IPCCC 2020, and IEEE ICC 2021. He is an IEEE Fellow and an ACM Member. For more information, see http://faculty.umb.edu/xiaohui.liang/.

**Publishing: 130+ refereed publications**. **Google Citation is 13,620, and H-Index is 55, as of July 2025**.

**Mentoring:** Four current PhD students and one master's student. Five PhD students graduated: tenure-track assistant professor at Assumption University (2023-); a visiting assistant professor at Clark University (2018-), and a tenure-track assistant professor at Shaqra University, Saudi Arabia (2019-)

**Teaching:** Speech and Language Processing (2024), Cybersecurity in the Internet of Things (2018-25), Applied Cryptography (2019-25), Programming in C, Network Security Administration, and Science Gateway Seminar

**Internal Services:** Institutional Review Board (University level), Academic Affairs Committee (College level), Interim Chair, Associate Chair, Search Committee Chair, and Personnel Committee (Department level).

**External Services:** NSF Panelist (2015, 2017, 2021, and 2025), Associate Editor of IEEE Internet of Things and Frontiers in Computer Science, Guest Editor of Sensors Journal, Frontiers in Neuroinformatics, Smart Health Journal, TPC chair of IEEE Healthcom 2026, Track Chair of IEEE Metacom 2025, PST 2024, IEEE ICC 2022, and IEEE ICPADS 2020. Secretary of IEEE Communications and Information Security Technical Committee (CISTC).

## Funding

Weymouth Goverment, 4/2025 - 6/2025, $99,996 PI
*Implement Multi-Factor Authentication for Weymouth Town Services*
Collaborators: Co-PI Yinxin Wan.

NIH NIA P30-AG073104 (Pilot Award), $60,522 direct for 6/2023 - 5/2025 (UMB direct $21,100) MPI
*Geriatric Functional Assessment System Using Passive Wearable Sensing and Deep Learning*
Collaborators: MPI Batsis (University of North Carolina at Chapel Hill)

NIH NIA R01-AG067416, $1,179,714 for 9/2019 - 5/2025 (UMB share $711,692) Single PI
*Exploiting Voice Assistant Systems for Early Detection of Cognitive Decline*
Collaborators: Co-Is John Batsis (University of North Carolina at Chapel Hill) and Robert Roth (Dartmouth Hitchcock Medical Center), and Consultants David Kotz (Dartmouth College) and Brian MacWhinney (Carnegie Mellon University).

NSF NeTS, $349,993 for 2016-2020 (UMB share $199,994) Lead PI
*Towards Privacy-Preserving Autonomous Vehicle Sharing Services*
Collaborator: PI Mohamed Mahmoud (Tennessee Technological University).

UMB Joseph P. Healey Research Grant, $7,500 for 2018 PI
*Efficient and Privacy-preserving Human Contact Tracing for Infection Detection*

UMB Joseph P. Healey Research Grant, $7,500 for 2016-2017 PI
*Towards Privacy-preserving Data Release in Mobile Healthcare*

UMB Startup Funding, $90,000 for 2015-2020 PI

## Honors and Awards

- Presidential Poster Award, American Geriatrics Society 2022
- Best Paper Award, ICC (International Conference on Communications) (15/1881) 2021
- Best Paper Award, IPCCC (International Performance Computing and Communications Conference) (2/99) 2020
- LightTouch paper has been highlighted in IEEE Computer's Spotlight on Transactions column 2020
- Early Career Research Excellence Award from UMB College of Science and Mathematics 2020
- UMB nominee for the 2020/21 Blavatnik National Awards for Young Scientists (1 out of 3) 2019/20
- Early Career Award for Excellence from the IEEE Technical Committee on Scalable Computing 2017
- Best Land Transportation Paper Award from the IEEE Vehicular Technology Society 2017
- Internet of Things (IoT) Technology Research Award from Google 2016
- Accomplishment with Distinction on An Introduction to Evidence-Based Undergraduate STEM Teaching, a teaching course from Coursera 2014
- Outstanding Achievement in Graduate Studies, University of Waterloo 2013
- Ontario Graduate Scholarship, University of Waterloo 2012-2013
- President's Graduate Scholarship, University of Waterloo 2012-2013
- Doctoral Thesis Completion Award, University of Waterloo 2013
- Faculty of Engineering Graduate Scholarship, University of Waterloo 2012-2013
- Ontario Research and Development Challenge Fund Bell Scholarship 2012
- Graduate Scholarship, University of Waterloo, five consecutive terms 2010-2011
- International Doctoral Student Award, University of Waterloo 2009-2012
- INFOCOM 2011 Student Travel Grant 2011
- Shanghai Excellent Master Thesis Award 2011
- Best Paper, BodyNets (International Conference on Body Area Networks) 2010
- National Excellent Graduate Scholarship, China 2007
- Excellent Graduate, Shanghai Jiao Tong University 2006
- Excellent Undergraduate Thesis Award, Shanghai Jiao Tong University 2006
- First Price, 18th National Contest in Mathematics, Hubei Region, China 2002

# Publications

Book:

B1. Xiaohui Liang, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *Security and Privacy in Mobile Social Networks. Springer Briefs in Computer Science*, ISBN 978-1-4614-8856-9, 2013. (*recommended by ACM Computing Reviews*)

B2. Mi Wen, Rongxing Lu, Xiaohui Liang, Jingsheng Lei, and Xuemin (Sherman) Shen. *Querying over Encrypted Data in Smart Grids. SpringerBriefs in Computer Science*, ISBN: 978-3-319-06354-6, 2014.

Book Chapter:

T1. Kuan Zhang, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *Exploiting Private Profile Matching for Efficient Packet Forwarding in Mobile Social Networks*, *Handbook on Opportunistic Mobile Social Networks*. CRC Press, Taylo & Francis Group, USA, 2013.

Refereed Journal Papers:

J1. Simone Khandpekar, Rishank Singh, Caroline Summerour, Jim Schwoebel, Xiaohui Liang, and John Batsis. *Feasibility and Usability of a Voice-Based Dietary Recall Tool in Older Adults: A Pilot Comparison with ASA-24*, *Digital Health*, 2025.

J2. Youxiang Zhu, Nana Lin, Xiaohui liang, John A. Batsis, Robert M. Roth, and Brian MacWhinney. *Evaluating Picture Description Speech for Dementia Detection using Image-text Alignment*, *ACM Transactions on Computing for Healthcare*, 2025.

J3. Roba Alsaigh, Rashid Mehmood, Iyad Katib, Xiaohui Liang, Abdullah Alshanqiti, Juan M. Corchado, and Simon See. *Harmonizing AI governance regulations and neuroinformatics: perspectives on privacy and data sharing*, *Frontiers in Neuroinformatics*, 18 (2024): 1472653.

J4. Rahi R. Shah, Claudia C. Dixon, Michael J. Fowler, Tiffany M. Driesse, Xiaohui Liang, Caroline E. Summerour, Danae C. Gross, Hillary B. Spangler, David H. Lynch, and John A. Batsis, *Using Voice Assistant Systems to Improve Dietary Recall Among Older Adults: Perspectives of Registered Dietitians*, *Journal of Nutrition in Gerontology and Geriatrics*, Volume 43, Issue 1, 2024.

J5. Hillary B. Spangler, Tiffany M. Driesse, Michael J. Fowler, David H. Lynch, Xiaohui Liang, Danae C. Gross, Curtis Petersen, and John A Batsis, *Feasibility of using the Automated Self-Administered 24-hour (ASA-24) Dietary Assessment Tool in Older Adults*, *Digital Health*, 2023

J6. Hillary B. Spangler, Tiffany M. Driesse, David H. Lynch, Xiaohui Liang, Robert M. Roth, David Kotz, Karen Fortuna, and John A Batsis, *Privacy Concerns of Older Adults Using Voice Assistant Systems*, *Journal of the American Geriatrics Society*, 70(12), 2022.

J7. Xiaohui Liang, John Batsis, Youxiang Zhu, Tiffany Driesse, Robert Roth, David Kotz, and Brian MacWhinney, *Evaluating Voice-Assistant Commands for Dementia Detection*, *Elsevier Computer Speech and Language Special Issue on Speech Based Evaluation of Neurological Diseases*, 2021

J8. Youxiang Zhu, Xiaohui Liang, John Batsis, and Robert Roth, *Exploring Deep Transfer Learning Techniques for Alzheimer's Dementia Detection. Frontiers in Computer Science Special Issue on Alzheimer's Dementia Recognition through Spontaneous Speech*, 2021

J9. Bang Tran and Xiaohui Liang. *Exploiting Peer-to-peer Communications for Query Privacy Preservation in Voice Assistant Systems. Peer-to-Peer Networking and Applications*, Springer, 2020.

J10. Yan Meng, Jinlei Li, Haojin Zhu, Xiaohui Liang, Yao Liu, and Na Ruan. *Revealing Your Mobile Password via WiFi Signals: Attacks and Countermeasures. IEEE Transactions on Mobile Computing*, vol. 19, no. 2, 2020.

J11. Xiaohui Liang, Ronald Peterson, and David Kotz. *Securely Connecting Wearables to Ambient Displays with User Intent. IEEE Transactions on Dependable and Secure Computing*, vol. 17, no. 4, 2020.

J12. Donghuan Yao, Mi Wen, Xiaohui Liang, Zipeng Fu, Kai Zhang, and Baojia Yang. *Energy Theft Detection with Energy Privacy Preservation in the Smart Grid. IEEE Internet of Things Journal*, vol. 6, no. 5, pp. 7659-7669, 2019.

J13. Mohammad Hadian, Thamer Altuwaiyan, Xiaohui Liang, and Haojin Zhu. *Privacy-preserving Task Scheduling for Time-sharing Services of Autonomous Vehicles. IEEE Transactions on Vehicular Technology*, vol. 68, no. 6, pp. 5260-5270, 2019.

J14. Mohammad Hadian, Thamer Altuwaiyan, Xiaohui Liang, and Wei Li. *Privacy-preserving Voice-based Search over mHealth Data. Smart Health Journal*, vol. 12, pp. 24-34, 2019.

J15. Kuan Zhang, Xiaohui Liang, Jianbing Ni, Kan Yang, and Xuemin (Sherman) Shen. *Exploiting Social Network to Enhance Human-to-Human Infection Analysis Without Privacy Leakage. IEEE Transactions on Dependable and Secure Computing*, vol. 15, no. 4, pp. 607-620, 2018.

J16. Kuan Zhang, Jianbing Ni, Kan Yang, Xiaohui Liang, Ju Ren, and Xuemin (Sherman) Shen. *Security and Privacy in Smart City Applications: Challenges and Solutions. IEEE Communications Magazine*, vol. 55, no. 1, pp. 122-129, 2017.

J17. Mengyuan Li, Ruan Na, Qiyang Qian, Haojin Zhu, Xiaohui Liang, and Le Yu. *SPFM: Scalable and Privacy-preserving Friend Matching in Mobile Cloud. IEEE Internet of Things Journal*, vol. 4, no. 2, pp. 583-591, 2017.

J18. Ahmed Sherif, Khaled Rabieh, Mohamed Mahmoud, and Xiaohui Liang. *Privacy-Preserving Ride Sharing Scheme for Autonomous Vehicles in Big Data Era. IEEE Internet of Things Journal*, vol. 4, no. 2, pp. 611-618, 2017.

J19. Yuan Zhang, Chunxiang Xu, Xiaohui Liang, Hongwei Li, Mu Yi, and Xiaojun Zhang. *Efficient Public Verification of Data Integrity for Cloud Storage Systems from Indistinguishability Obfuscation. IEEE Transactions on Information Forensics and Security*, vol. 12, no. 3, pp. 676-688, 2017.

J20. Huaxin Li, Haojin Zhu, Suguo Du, Xiaohui Liang, and Xuemin (Sherman) Shen. *Privacy Leakage of Location Sharing in Mobile Social Networks: Attacks and Defense. IEEE Transactions on Dependable and Secure Computing*, vol. 15, no. 4, pp. 646-660, 2016.

J21. Hao Ren, Hongwei Li, Xiaohui Liang, Shibo He, Yuanshun Dai, and Lian Zhao. *Privacy-Enhanced and Multifunctional Health Data Aggregation under Differential Privacy Guarantees. MDPI Sensors*, vol. 16, no. 9, 2016.

J22. Yuan Zhang, Chunxiang Xu, Hongwei Li, and Xiaohui Liang. *Cryptographic Public Verification of Data Integrity for Cloud Storage Systems. IEEE Cloud Computing*, vol. 3, no. 5, pp. 44-52, 2016.

J23. Hongwei Li, Yi Yang, Tom Luan, Xiaohui Liang, Liang Zhou, and Xuemin (Sherman) Shen. *Enabling Fine-grained Multi-keyword Search Supporting Classified Sub-dictionaries over Encrypted Cloud Data. IEEE Transactions on Dependable and Secure Computing (TDSC)*, vol. 13, no. 3, pp. 312-325, 2016.

J24. Kuan Zhang, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *PIF: A Personalized Fine-grained Spam Filtering Scheme with Privacy Preservation in Mobile Social Network. IEEE Transactions on Computational Social Systems (TCSS)*, vol. 2, no. 3, pp. 41-52, 2015.

J25. Kuan Zhang, Kan Yang, Xiaohui Liang, Zhou Su, Xuemin (Sherman) Shen, and Henry Luo. *Security and Privacy for Mobile Healthcare Networks – from Quality-of-Protection Perspective. IEEE Wireless Communications*, vol. 22, no. 4, pp. 104-112, 2015.

J26. Kuan Zhang, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *Sybil Attacks and Their Defenses in the Internet of Things. IEEE Internet of Things Journal*, vol. 1, no. 5, pp. 372-383, 2014.

J27. Kuan Zhang, Xiaohui Liang, Mrinmoy Barua, Rongxing Lu, and Xuemin (Sherman) Shen. *PHDA: A Priority Based Health Data Aggregation with Privacy Preservation for Cloud Assisted WBANs. Information Sciences*, Elsevier, vol. 284, pp. 130-141, 2014.

J28. Xiaohui Liang, Xiaodong Lin, Kuan Zhang, and Xuemin (Sherman) Shen. *Security and Privacy in Mobile Social Network: Challenges and Solutions. IEEE Wireless Communications*, vol.21, no.1, pp.33-41, 2014.

J29. Chengzhe Lai, Hui Li, Xiaohui Liang, Rongxing Lu, Kuan Zhang, and Xuemin (Sherman) Shen. *CPAL: A Conditional Privacy-Preserving Authentication with Access Linkability for Roaming Service. IEEE Internet of Things Journal*, vol. 1, no. 1, pp. 46-57, 2014.

J30. Xiaohui Liang, Xiaodong Lin, and Xuemin (Sherman) Shen. *Enabling Trustworthy Service Evaluation in Service-oriented Mobile Social Networks. IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 25, no. 2, pp. 310-320, 2014.

J31. Kuan Zhang, Xiaohui Liang, Xuemin (Sherman) Shen, and Rongxing Lu. *Exploiting Multimedia Services in Mobile Social Networks from Security and Privacy Perspectives. IEEE Communications Magazine*, vol.52, no.3, pp.58-65, 2014.

J32. Qinghua Shen, Xiaohui Liang, Xuemin (Sherman) Shen, Xiaodong Lin, and Henry Luo. *Exploiting Geo-Distributed Clouds for E-Health Monitoring System with Minimum Service Delay and Privacy Preservation. IEEE Journal of Biomedical and Health Informatics*, vol. 18, no. 2, pp. 430-439, 2014.

J33. Hongwei Li, Xiaodong Lin, Haomiao Yang, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *EPPDR: An Efficient Privacy-Preserving Demand Response Scheme with Adaptive Key Evolution in Smart Grid. IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 25, no. 8, pp. 2053-2064, 2014.

J34. Mi Wen, Rongxing Lu, Jingsheng Lei, Hongwei Li, Xiaohui Liang, and Xuemin (Sherman) Shen. *SESA: An Efficient Searchable Encryption Scheme for Auction in Emerging Smart Grid Marketing. Security and Communication Networks (SCN)*, vol. 7, no. 1, pp. 234-244, 2014.

J35. Xiaohui Liang, Xu Li, Kuan Zhang, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *Fully Anonymous Profile Matching in Mobile Social Networks. IEEE Journal on Selected Areas of Communications (JSAC)*, vol. 31, no. 9, pp. 641-655, 2013.

J36. Xiaohui Liang, Kuan Zhang, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *EPS: An Efficient and Privacy-Preserving Service Searching Scheme for Smart Community. IEEE Sensor Journal*, vol. 13, no. 10, pp. 3702-3710, 2013.

J37. Mi Wen, Kuan Zhang, Jingsheng Lei, Xiaohui Liang, Ruilong Deng, and Xuemin (Sherman) Shen. *CIT: A Credit-based Incentive Tariff Scheme with Fraud-traceability for Smart Grid. Security and Communication Networks*, Nov. 2013.

J38. Mi Wen. Rongxing Lu, Kuan Zhang, Jingsheng Lei, Xiaohui Liang, and Xuemin (Sherman) Shen. *PaRQ: A Privacy-preserving Range Query Scheme over Encrypted Metering Data for Smart Grid. IEEE Transactions on Emerging Topics in Computing (TETC)*, vol. 1, no. 1, pp. 178-191, 2013.

J39. Mrinmoy Barua, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *RCare: Extending Secure Health Care to Rural Area Using VANETs. ACM Mobile Networks and Applications (MONET)*, vol. 19, no. 3, pp. 318-330, 2013.

J40. Xiaohui Liang, Xu Li, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *UDP: Usage-based Dynamic Pricing with Privacy Preservation for Smart Grid. IEEE Transactions on Smart Grid (TSG)*, vol. 4, no. 1, pp. 141-150, 2013.

J41. Xiaohui Liang, Xu Li, Tom Luan, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *Morality-driven Data Forwarding with Privacy Preservation in Mobile Social Networks. IEEE Transactions on Vehicular Technology (TVT)*, vol. 61, no. 7, pp. 3209-3221, 2012.

J42. Rongxing Lu, Xiaohui Liang, Xu Li, Xiaodong Lin, and Xuemin (Sherman) Shen. *EPPA: An Efficient and Privacy-Preserving Aggregation Scheme for Secure Smart Grid Communications. IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 23, no. 9, pp. 1621-1631, 2012.

J43. Xiaohui Liang, Xu Li, Mrinmoy Barua, Le Chen, Rongxing Lu, Xuemin (Sherman) Shen, and Henry Luo. *Enable Pervasive Healthcare through Continuous Remote Health Monitoring. IEEE Wireless Communications*, vol. 19, no. 6, pp. 10-18, 2012.

J44. Xu Li, Xiaohui Liang, Rongxing Lu, Xiaodong Lin, Haojing Zhu, and Xuemin (Sherman) Shen. *Securing Smart Grid: Cyber Attacks, Countermeasures and Challenges. IEEE Communications Magazine*, vol. 50, no. 8, pp. 38-45, 2012.

J45. Xiaohui Liang, Mrinmoy Barua, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *HealthShare: Achieving Secure and Privacy-preserving Health Information Sharing through Health Social Networks. Computer Communications*, vol. 35, no. 15, pp. 1910-1920, 2012.

J46. Rongxing Lu, Xiaodong Lin, Tom Luan, Xiaohui Liang, and Xuemin (Sherman) Shen. *Pseudonym Changing at Social Spots: An Effective Strategy for Location Privacy in VANETs. IEEE Transactions on Vehicular Technology (TVT)*, vol. 61, no. 1, pp. 86-96, 2012.

J47. Xu Li, Rongxing Lu, Xiaohui Liang, Jiming Chen, Xiaodong Lin, and Xuemin (Sherman) Shen. *Smart Community: an Internet of Things Application. IEEE Communications Magazine*, vol. 49, no. 11, pp. 68-75, 2011.

J48. Mrinmoy Barua, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *ESPAC: Enabling Security and Patient-centric Access Control for eHealth in Cloud Computing. International Journal of Security and Networks*, vol. 6, no. 2, pp. 67-76, 2011.

J49. Rongxing Lu, Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *A Secure Handshake Scheme with Symptoms-Matching for mHealthcare Social Network. ACM Mobile Networks and Applications (MONET)*, vol. 16, no. 6, pp. 683-694, 2011.

J50. Rongxing Lu, Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *An Efficient and Provably Secure Public Key Encryption Scheme based on Coding Theory. Security and Communication Networks (SCN)*, vol. 4, no. 12, pp. 1440-1447, 2011.

J51. Xiaohui Liang, Mrinmoy Barua, Rongxing Lu, and Xuemin (Sherman) Shen. *Privacy-preserving Wireless Data Transmission for e-Healthcare Applications. IEEE COMSOC MMTC E-Letter*, vol. 6, no. 11, pp. 39-41, 2011.

J52. Rongxing Lu, Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *A Dynamic Privacy-Preserving Key Management Scheme for Location Based Services in VANETs. IEEE Transactions on Intelligent Transportation Systems (TITS)*, vol. 13, no. 1, pp. 127-139, 2012.

J53. Xiaohui Liang, Rongxing Lu, Le Chen, Xiaodong Lin, and Xuemin (Sherman) Shen. *PEC: A Privacy-preserving Emergency Call Scheme for Mobile Healthcare Social Networks. IEEE Journal of Communications and Networks*, vol. 13, no. 2, pp. 102-112, 2011.

J54. Rongxing Lu, Xu Li, Xiaohui Liang, Xiaodong Lin, and Xuemin (Sherman) Shen. *GRS: The Green, Reliability, and Security of Emerging Machine to Machine Communications. IEEE Communications Magazine*, vol. 49, no. 4, pp. 28-35, 2011.

J55. Rongxing Lu, Xiaodong Lin, Haojing Zhu, Xiaohui Liang, and Xuemin (Sherman) Shen. *BECAN: A Bandwidth-Efficient Cooperative Authentication Scheme for Filtering Injected False Data in Wireless Sensor Networks. IEEE Transactions on Parallel and Distributed Systems (TPDS)*, vol. 23, no. 1, pp. 32-43, 2010.

J56. Huang Lin, Zhenfu Cao, Xiaohui Liang, and Jun Shao. *Secure Threshold Multi Authority Attribute based Encryption without a Central Authority. Information Sciences*, vol. 180, no. 13, pp. 2618-2632, 2010.

J57. Jun Shao , Zhenfu Cao , Xiaohui Liang , and Huang Lin. *Proxy Re-encryption with Keyword Search. Information Sciences*, vol. 180, no. 13, pp. 2576-2587, 2010.

J58. Xiaohui Liang, Zhenfu Cao, Rongxing Lu, and Liuquan Qin. *Efficient and Secure Protocol in Fair Document Exchange. Computer Standards and Interfaces*, vol. 30, no. 3, pp. 167-176, 2008.

J59. Rongxing Lu, Xiaodong Lin, Zhenfu Cao, Jun Shao, and Xiaohui Liang. *New (t, n) Threshold Directed Signature Scheme with Provable Security. Information Sciences*, vol. 178, no. 3, 2008, pp. 756-765.

Refereed Conference Papers:

C1. Karmesh Chaudhari, Youxiang Zhu, Amy Feng, Xiaohui Liang, and Honggang Zhang, *Assessing Privacy Preservation and Utility in Online Vision-Language Models*, *IEEE International Conference on Communications (ICC)*, 2026

C2. Kristin Qi, Youxiang Zhu, Caroline Summerour, John A. Batsis, Xiaohui Liang, *Cog-TiPRO: Iterative Prompt Refinement with LLMs to Detect Cognitive Decline via Longitudinal Voice Assistant Commands*, *IEEE Global Communications Conference (GLOBECOM)*, 2025

C3. Kristin Qi, Jiali Cheng, Youxiang Zhu, Hadi Amiri, Xiaohui Liang, *Unveil Multi-Picture Descriptions for Multilingual Mild Cognitive Impairment Detection via Contrastive Learning*, *IEEE Global Communications Conference (GLOBECOM)*, 2025

C4. Kristin Qi, Youxiang Zhu, and Xiaohui Liang, *Enhancing Perspective-Aware Summarization with Prompt Optimization and Supervised Fine-Tuning*, *NAACL workshop on CL4Health*, 2025.

C5. Youxiang Zhu, Nana Lin, Kiran Sandilya Balivada, Daniel Haehn, and Xiaohui Liang, *Adversarial Text Generation using Large Language Models for Dementia Detection*, *The 2024 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2024.

C6. Kristin Qi and Xiaohui Liang, *Exploiting Longitudinal Speech Data via Voice Assistant Systems for Early Detection of Cognitive Decline*, *the 19th Workshop for Women in Machine Learning (WiML), with NeurIPS*, 2024

C7. Rishank Singh, Sankalp Vaish, Xiaohui Liang, Jennifer G. Poole, and John A. Batsis, and Danae C. Gross, *Clinical Geriatric Functional Assessment using Wearable Sensing and Machine Learning*, *IEEE International Conference on E-health Networking, Application & Services (Healthcom)*, 2024

C8. Kristin Qi, Jiatong Shi, Caroline Summerour, John A. Batsis, and Xiaohui Liang, *Exploiting Longitudinal Speech Sessions via Voice Assistant Systems for Early Detection of Cognitive Decline*, *IEEE International Conference on E-health Networking, Application & Services (Healthcom)*, 2024

C9. Youxiang Zhu, Ning Gao, Xiaohui Liang, and Honggang Zhang, *Exploiting Privacy Preserving Prompt Techniques for Online Large Language Model Usage*, *IEEE Global Communications Conference (GLOBECOM)*, 2024

C10. Nana Lin, Youxiang Zhu, Xiaohui Liang, Caroline E. Summerour, John A. Batsis, *Analyzing Multimodal Features of Spontaneous Voice Assistant Commands for Mild Cognitive Impairment Detection*, *Conference of the International Speech Communication Association (INTERSPEECH)*, 2024

C11. Bang Tran, Sai Harshavardhan Reddy Kona, Xiaohui Liang, Gabriel Ghinita, Caroline Summerour, and John A. Batsis, *VPASS: Voice Privacy Assistant System for Monitoring In-home Voice Commands, 20th International Conference on Privacy, Security, and Trust (PST)*, 2023.

C12. Youxiang Zhu, Nana Lin, Xiaohui Liang, John A. Batsis, Robert M. Roth, Brian MacWhinney, *Evaluating Picture Description Speech for Dementia Detection using Image-text Alignment*, *Multimodal KDD 2023: International Workshop on Multimodal Learning*, 2023.

C13. Eli Kurtz, Youxiang Zhu, Tiffany Driesse, Bang Tran, John A. Batsis, Robert M. Roth, and Xiaohui Liang, *Early Detection of Cognitive Decline using Voice Assistant Commands*, *IEEE International Conference on Acoustic, Speech and Signal Processing (ICASSP)*, 2023

C14. Bang Tran, Youxiang Zhu, James W. Schwoebel, and Xiaohui Liang, Exploiting *Relevance of Speech to Sleepiness Detection via Attention Mechanism*, *IEEE International Conference on Communications (ICC)*, 2023.

C15. Yue Sun, Zhuoming Huang, Honggang Zhang, and Xiaohui Liang, *3D reconstruction of multiple objects by mmWave radar on UAV*, *in 2022 IEEE 19th International Conference on Mobile Ad Hoc and Smart Systems (MASS)*, pp. 491-495, 2022.

C16. Youxiang Zhu, Xiaohui Liang, John A. Batsis, and Robert M. Roth, *Domain-aware Intermediate Pretraining for Dementia Detection with Limited Data*, *Conference of the International Speech Communication Association (INTERSPEECH)* 2022.

C17. Xiaohui Liang, John A. Batsis, Jing Yuan, Youxiang Zhu, Tiffany M. Driesse, and Josh Schultz, *Voice-assisted Food Recall using Voice Assistants*, *International Conference on Human-Computer Interaction (HCII)*, 2022.

C18. Youxiang Zhu, Bang Tran, Xiaohui Liang, John A. Batsis, and Robert M. Roth, *Towards Interpretability of Speech Pause in Dementia Detection using Adversarial Learning. International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2022.

C19. Bang Tran, Youxiang Zhu, Xiaohui Liang, James W. Schwoebel, Lindsay A. Warrenburg, *Speech Tasks Relevant to Sleepiness Determined with Deep Transfer Learning. International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, 2022.

C20. Youxiang Zhu, Abdelrahman Obyat, Xiaohui Liang, John Batsis, and Robert Roth, *WavBERT: Exploiting Semantic and Non-semantic Speech using Wav2vec andBERT for Dementia Detection. Conference of the International Speech Communication Association (INTERSPEECH)*, 2021.

C21. Bang Tran, Shenhui Pan, Xiaohui Liang, and Honggang Zhang, *Exploiting Physical Presence Sensing to SecureVoice Assistant Systems. IEEE International Conference on Communications (ICC)*, 2021, **Best Paper Award, 15/1881**.

C22. Yue Sun, Deqiang Xu, Zhuoming Huang, Honggang Zhang, and Xiaohui Liang. *LIDAUS: Localization of IoT Device via Anchor UAV SLAM. IEEE International Performance Computing and Communications Conference (IPCCC)*, 2020, **Best Paper Award, 2/99**.

C23. Thamer Altuwaiyan, Mohammad Hadian, Samuel Rubel, and Xiaohui Liang. *Exploiting Privacy-preserving Voice Query in Healthcare-based Voice Assistant System. IEEE International Conference on Communications (ICC)*, 2020.

C24. Shuaiqi Shen, Song Ci, Kuan Zhang, and Xiaohui Liang. *Lifecycle Prediction of Second Use Electric Vehicle Batteries Based on ARIMA Model. IEEE GLOBECOM Workshop on Cyber-Physical Energy System for Sustainable ICT*, 2019.

C25. Mohammad Hadian, Thamer Altuwaiyan, Xiaohui Liang, Bo Sheng, and Kuan Zhang. *SmartEye: Mobile Device Proximity Monitoring via Wireless Signal Analysis. IEEE International Conference on Computing, Networking and Communications (ICNC)*, 2019. (Accepting ratio 28%)

C26. Tengpeng Li, Xiaoqian Zhang, Teng Wang, Son Nam Nguyen, Xiaohui Liang, and Bo Sheng. *FARES: Fast and Accurate Recognition of Exact Scenes on Mobile Devices. IEEE International Conference on Computing, Networking and Communications (ICNC)*, 2019. (Accepting ratio 28%)

C27. Mohammad Hadian, Thamer Altuwaiyan, Haoyu Wang, and Xiaohui Liang. *WiLock: Exploiting Wireless Signals for Device-free Continuous Authentication. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2018.

C28. Haoyu Wang, Mohammad Hadian, and Xiaohui Liang. *Efficient and Privacy-preserving Roadmap Data Update for Autonomous Vehicles. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2018.

C29. Yan Meng, Zichang Wang, Wei Zhang, Peilin Wu, Haojin Zhu, Xiaohui Liang, and Yao Liu. *WiVo: Enhancing the Security of Voice Control System via Wireless Signal in IoT Environment. ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc)*, 2018.

C30. Thamer Altuwaiyan, Mohammad Hadian, Xiaohui Liang, and Wei Li. *EPIC: Efficient Privacy-preserving Contact Tracing for Infection Detection. IEEE International Conference on Communications (ICC)*, 2018.

C31. Haizhong Zheng, Minhui Xue, Hao Lu, Shuang Hao, Haojin Zhu, Xiaohui Liang, and Keith Ross. *Smoke Screener or Straight Shooter: Detecting Elite Sybil Attacks in User-Review Social Networks. Network and Distributed System Security Symposium (NDSS)*, 2018.

C32. J. Zhang, Xiaohui Liang, Z. Zhang, Shibo He, and Zhiguo Shi. *Re-DPoctor: Real-time health data releasing with w-day differential privacy. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2017.

C33. Mohammad Hadian, Thamer Altuwaiyan, and Xiaohui Liang. *Privacy-preserving Time-sharing Services for Autonomous Vehicles. IEEE 86th Vehicular Technology Conference (VTC-Fall)*, 2017.

C34. Aarathi Prasad, Xiaohui Liang, and David Kotz. *SPICE: Secure Proximity-based Infrastructure for Close Encounters. ACM Workshop on Mobile Crowdsensing Systems and Applications (CrowdSense)*, 2017.

C35. Xiaohui Liang and David Kotz. *AuthoRing: Wearable User-presence Authentication. ACM Workshop on Wearable Systems and Applications (WearSys)*, pages 5-10, 2017.

C36. Mohammad Hadian, Thamer Altuwaiyan, Xiaohui Liang, and Wei Li. *Efficient and Privacy-Preserving Voice-Based Search over mHealth Data. The International Workshop on Security, Privacy, and Trustworthiness in Medical Cyber-Physical Systems (MedSPT)*, 2017.

C37. Xiaohui Liang, Tianlong Yun, Ronald Peterson, and David Kotz. *LightTouch: Securely Connecting Wearables to Ambient Displays with User Intent. IEEE International Conference on Computer Communications (INFOCOM)*, 2017. (Acceptance rate is 20.93%)

C38. Mengyuan Li, Yan Meng, Junyi Liu, Haojin Zhu, Xiaohui Liang, Yao Liu, and Na Ruan. *When CSI Meets Public WiFi: Inferring Your Mobile Phone Password via WiFi Signals. The 23rd ACM Conference on Computer and Communications Security (CCS)*, 2016. (Acceptance rate is 16.37%)

C39. Mohammad Hadian, Xiaohui Liang, Thamer Altuwaiyan, and Mohamed Mahmoud. *Privacy-preserving mHealth Data Release with Pattern Consistency. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2016.

C40. Guowen Xu, Hongwei Li, Dongxiao Liu, Hao Ren, Yuanshun Dai, Xiaohui Liang. *Towards Efficient Privacy-preserving Truth Discovery in Crowd Sensing Systems. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2016.

C41. Thamer Altuwaiyan, Xiaohui Liang, and Mohammad Hadian. *Towards Efficient and Privacy-preserving Location-based Comment Sharing. IEEE/CIC International Conference on Communications in China (ICCC)*, July, 2016.

C42. Tim Pierson, Xiaohui Liang, Ronald Peterson, and David Kotz. *Wanda: Securely Introducing Mobile Devices. IEEE International Conference on Computer Communications (INFOCOM)*, 2016. (Acceptance rate is 18.25%)

C43. Kuan Zhang, Xiaohui Liang, Rongxing Lu, Kan Yang, and Xuemin (Sherman) Shen. *Exploiting Mobile Social Behaviors for Sybil Detection. IEEE International Conference on Computer Communications (INFOCOM)*, 2015. (Acceptance rate is 19%)

C44. Xiaohui Liang, and David Kotz. *Securely Connecting Wearable Health Devices to External Displays. USENIX Summit on Health Information Technologies*, August, 2014.

C45. Qinghua Shen, Xiaohui Liang, Xuemin (Sherman) Shen, Xiaodong Lin, and Henry Luo. *RECCE: A Reliable and Efficient Cloud Cooperation Scheme in E-healthcare. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2013.

C46. Kuan Zhang, Rongxing Lu, Xiaohui Liang, Jian Qiao, and Xuemin (Sherman) Shen. *PARK: A Privacy-preserving Aggregation Scheme with Adaptive Key Management for Smart Grid. IEEE & CIC International Conference on Communications in China (ICCC)*, August 2013.

C47. Kuan Zhang, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *SAFE: A Social Based Updatable Filtering Protocol with Privacy Preservation in Mobile Social Networks. IEEE International Conference on Communications (ICC)*, June 2013.

C48. Hongwei Li, Xiaohui Liang, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *EDR: An Efficient Demand Response Scheme for Achieving Forward Secrecy in Smart Grid. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2012.

C49. Kuan Zhang, Xiaohui Liang, Rongxing Lu, Xuemin (Sherman) Shen, and Hai Zhao. *VSLP: Voronoi-Socialspot-Aided Packet Forwarding Protocol with Receiver Location Privacy in MSNs. IEEE Global Telecommunications Conference (GLOBECOM)*, December 2012.

C50. Xiaohui Liang, Xu Li, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *SEER: A Secure and Efficient Service Review System for Service-Oriented Mobile Social Networks. International Conference on Distributed Computing Systems (ICDCS)*, June 2012. (Acceptance rate is 13%)

C51. Xiaohui Liang, Xu Li, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *Enabling Pervasive Healthcare with Privacy Preservation in Smart Community. IEEE International Conference on Communications (ICC)*, June 2012.

C52. Xiaohui Liang, Xu Li, Qinghua Shen, Rongxing Lu, Xiaodong Lin, Xuemin (Sherman) Shen, and Weihua Zhang. *Exploiting Prediction to Enable Secure and Reliable Routing in Wireless Body Area Networks. IEEE International Conference on Computer Communications (INFOCOM)*, March 2012. (Acceptance rate is 17.97%)

C53. Rongxing Lu, Xiaodong Lin, Tom Luan, Xiaohui Liang, Xu Li, Le Chen, and Xuemin (Sherman) Shen. *PReFilter: A Privacy-preserving Relay Filtering Scheme for Delay Tolerant Networks. IEEE International Conference on Computer Communications (INFOCOM)*, March 2012. (Acceptance rate is 17.97%)

C54. Xu Li, Shibo He, Jiming Chen, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *Coordinate-free Distributed Algorithm for Boundary Detection in Wireless Sensor Networks. IEEE Global Communications Conference (GLOBECOM)*, December 2011.

C55. Xiaohui Liang, Xu Li, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *An Efficient and Secure User Revocation Scheme in Mobile Social Networks. IEEE Global Communications Conference (GLOBECOM)*, December 2011.

C56. Le Chen, Zhenfu Cao, Rongxing Lu, Xiaohui Liang, and Xuemin (Sherman) Shen. *EPF: An Event-aided Packet Forwarding Protocol for Privacy-preserving Mobile Healthcare Social Networks. IEEE Global Communications Conference (GLOBECOM)*, December 2011.

C57. Xu Li, Xiaohui Liang, Rongxing Lu, Shibo He, Jiming Chen, and Xuemin (Sherman) Shen. *Toward Reliable Actor Service in Wireless Sensor and Actor Networks. IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS)*, October 2011.

C58. Xiaohui Liang, Xu Li, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *Fine-grained Identification with Real-time Fairness in Mobile Social Networks. IEEE International Conference on Communications (ICC)*, June 2011.

C59. Xu Li, Rongxing Lu, Xiaohui Liang, and Xuemin (Sherman) Shen. *Side Channel Monitoring: Packet Drop Attack Detection in Wireless Ad Hoc Networks. IEEE International Conference on Communications (ICC)*, June 2011.

C60. Rongxing Lu, Xiaodong Lin, Tom Luan, Xiaohui Liang, and Xuemin (Sherman) Shen. *Anonymity Analysis on Social Spot Based Pseudonym Changing for Location Privacy in VANETs. IEEE International Conference on Communications (ICC)*, June 2011.

C61. Xiaodong Lin, Rongxing Lu, Xiaohui Liang and Xuemin (Sherman) Shen. *STAP: A Social-Tier-Assisted Packet Forwarding Protocol for Achieving Receiver-Location Privacy Preservation in VANETs. IEEE International Conference on Computer Communications (INFOCOM)*, April 2011. (Acceptance rate is 15.96%)

C62. Mrinmoy Barua, Xiaohui Liang, Rongxing Lu, and Xuemin (Sherman) Shen. *PEACE: An Efficient and Secure Patient-Centric Access Control Scheme for eHealth Care System. IEEE International Conference on Computer Communications workshops on Security in Computers, Networking and Communications (INFOCOM-SCNC)*, April 2011.

C63. Mrinmoy Barua, Md. Shamsul Alam, Xiaohui Liang, and Xuemin (Sherman) Shen. *Secure and Quality of Service Assurance Scheduling Scheme for WBAN with Application to EHealth. IEEE Wireless Communications and Networking Conference (WCNC)*, March 2011.

C64. Xiaohui Liang, Rongxing Lu, Xiaodong Lin, Xuemin (Sherman) Shen. *Message Authentication with Non-transferability for Location Privacy in Mobile Ad hoc Networks. IEEE Global Communications Conference (GLOBECOM)*, December 2010.

C65. Rongxing Lu, Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *FLIP: An Efficient Privacy-preserving Protocol for Finding Like-minded Vehicles on the Road. IEEE Global Communications Conference (GLOBECOM)*, December 2010.

C66. Rongxing Lu, Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *Sacrificing the Plum Tree for the Peach Tree: A Social-spot Tactic for Protecting Receiver-location Privacy in VANET. IEEE Global Communications Conference (GLOBECOM)*, December 2010.

C67. Xiaohui Liang, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *PPC: Privacy-preserving Chatting in Vehicular Peer-to-peer Networks. IEEE Vehicular Technology Conference (VTC-Fall)*, September, 2010.

C68. Rongxing Lu , Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *Secure Handshake with Symptoms-matching: The Essential to the Success of mHealthcare Social Network. International Conference on Body Area Networks (BodyNets)*, September, 2010. *Best Paper Award*

C69. Xiaohui Liang, Rongxing Lu, Xiaodong Lin, and Xuemin (Sherman) Shen. *Patient Self-controllable Access Policy on PHI in eHealthcare Systems. Advances in Health Informatics Conference (AHIC)*, April 2010.

C70. Huang Lin, Zhenfu Cao, Xiaohui Liang, Muxin Zhou, Haojin Zhu, Dongsheng Xing. *How to Construct Interval Encryption from Binary Tree Encryption. Applied Cryptography and Network Security (ACNS)*, April 2010. (Acceptance rate is 17.98%)

C71. Rongxing Lu, Xiaodong Lin, Xiaohui Liang, and Xuemin (Sherman) Shen. *Secure Provenance: The Essential of Bread and Butter of Data Forensics in Cloud Computing. ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, April, 2010. (Acceptance rate is 22.89%)

C72. Xiaohui Liang, Zhenfu Cao, Huang Lin and Dongsheng Xing. *Provably Secure and Efficient Bounded Ciphertext Policy Attribute Based Encryption. ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, March 2009. (Acceptance rate is 23.6%)

C73. Xiaohui Liang, Zhenfu Cao, Huang Lin and Jun Shao. *Attribute Based Proxy Re-encryption with Delegating Capabilities. ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, March 2009. (Acceptance rate is 23.6%)

C74. Huang Lin, Zhenfu Cao, Xiaohui Liang, and Jun Shao. *Secure Threshold Multi-authority Attribute Based Encryption without a Central Authority. International Conference on Cryptology in India (INDOCRYPT)*, December 2008.

C75. Jun Shao, Zhenfu Cao, Licheng Wang, and Xiaohui Liang. *Proxy Re-signature Schemes without Random Oracles. International Conference on Cryptology in India (INDOCRYPT)*, December 2007. (Acceptance rate is 20.95%)

C76. Xiaohui Liang, Zhenfu Cao, Jun Shao, and Huang Lin. *Short Group Signature without Random Oracles. International Conference on Information and Communications Security (ICICS)*, December 2007. (Acceptance rate is 17.12%)

C77. Xiaohui Liang, Zhenfu Cao, Zhenchuan Chai and Rongxing Lu. *ID-based Threshold Blind Signature scheme from Bilinear Pairing. ChinaCrypt 2006.*

## Patents

P1. Xiaohui Liang, Rishank Singh, John A. Batsis, Geriatric Functional Assessment System using Passive Wearable Sensing and Deep Learning. U.S. Provisional Patent Application, 2025.

P2. Xiaohui Liang, Tianlong Yun, Ron Peterson, and David Kotz, Secure System For Coupling Wearable Devices To Computerized Devices with Displays. U.S. Patent 10,581,606, March 3, 2020. Priority date 2014-08-18, Grant date 2020-03-03. Link

P3. Timothy J. Pierson, Xiaohui Liang, Ronald Peterson, and David Kotz, Apparatus for Securely Configuring A Target Device and Associated Methods. U.S. Patent 10,574,298, February 25, 2020. Priority date 2015-06-23, Grant date 2020-02-25. Link

## Others

O1. (Poster) Kristin Qi, Youxiang Zhu, Caroline Summerour, John A. Batsis, Xiaohui Liang, *Early Detection of Mild Cognitive Impairment Through Voice Assistant Interactions: An LLM-Driven Approach*, *at the New England NLP (NENLP) workshop*, 2025.

O2. (Poster) Youxiang Zhu, Ruochen Li, Danqing Wang, Daniel Haehn, Xiaohui Liang, *Focus Directions Make Your Language Models Pay More Attention to Relevant Contexts*, *at the New England NLP (NENLP) workshop*, 2025.

O3. (Poster) Jongsoo Ha, Xiaohui Liang, Youxiang Zhu, and Jim Schwoebel, *Watermarked Sequence Length Code Generation for Large Language Model*, *at National Collegiate Research Conference (NCRC) by the Harvard Undergraduate Research Association*, 2025.

O4. (Poster) John A. Batsis and Xiaohui Liang, *Geriatric Functional Assessment System Using Passive Wearable Sensing and Deep Learning*, *2nd Annual a2 National Symposium*, 2024

O5. (Poster) Bang Tran, Xiaohui Liang, Gabriel Ghinita, Caroline Summerour, and John A. Batsis, *Voice Privacy Assistant for Monitoring In-home Voice Commands*, *Nineteenth Symposium on Usable Privacy and Security (SOUPS)*, 2023

O6. (Poster) Youxiang Zhu and Xiaohui Liang, *More Data, Better Accuracy? An Empirical Study on Few-shot Speech-based Dementia Detection*, *Southern California Natural Language Processing Symposium (SoCal)*, 2022

O7. (Abstract) Tiffany M. Driesse, Xiaohui Liang, Michael Fowler, Jing Yuan, and John A. Batsis, *Patient Perceptions of Using Voice-Based Dietary Assessment Tools Among Older Adults*, *Gerontological Scientific Association conference*, 2022

O8. (Poster) Tiffany M. Driesse, Xiaohui Liang, Robert M. Roth, and John A. Batsis, *Older Adults Experiences and Responses to Voice Assistant Systems*, *American Geriatrics Society (AGS) annual meeting*, 2022. Best Poster Award in the category of Geriatric Syndromes (descriptive research on the mechanisms, natural history or management of major geriatric syndromes)

O9. (Student Design Competition) Jing Yuan, Tiffany Driesse, Youxiang Zhu, Xiaohui Liang, John Batsis, *Improving the Usability of Dietary Recall using Voice Assistants*, *International Conference on Human-Computer Interaction (HCII)*, 2022.

O10. (Abstract) Hillary Spangler, Tiffany Driesse, Robert Roth, Xiaohui Liang, John Batsis, and David Kotz, *Privacy Concerns Among Older Adults Using Voice Assistant Systems*, *Gerontological Scientific Association conference*, 2021.

O11. (Technical Report) Youxiang Zhu, and Xiaohui Liang. *Exploiting Fully Convolutional Network and Visualization Techniques on Spontaneous Speech for Dementia Detection. arXiv preprint arXiv:2008.07052*, 2020.

O12. (Poster) Aarathi Prasad, Xiaohui Liang, David Kotz. *Balancing Disclosure and Utility of Personal Information. ACM MobiSys*, 2014.

## Invited Talks

S1. *Exploiting Voice Assistant Systems for Early Detection of Cognitive Decline*, at the American Geriatrics Society (AGS) Annual Scientific Meeting, 2025.

S2. *Exploiting Human Speech for Early Detection of Cognitive Decline*, Keynote Speech at IEEE International Conference on Universal Village, 2022.

S3. *VoiceForHealth: Exploiting Voice Assistant Systems for Mobile Healthcare*, University of Massachusetts Dartmouth, Dartmouth, MA, 2019.

S4. *WiVo: Enhancing the Security of Voice Control System via Wireless Signal in IoT Environment*, Zhejiang, China, 2019.

S5. *Towards Trustworthy User Review Social Networks. International Workshop on Internet of Things*, Chengdu, China, 2018.

S6. *Smoke Screener or Straight Shooter: Detecting Elite Sybil Attacks in User-Review Social Networks.* Dartmouth College, Hanover, NH, 2018.

S7. *Towards Privacy Preserving Autonoumous Vehicle Sharing Services*, Zhejiang, China, 2017.

S8. *Security, Privacy, and Trustworthiness in Medical Cyber Physical Systems*, Zhejiang, China, 2017.

S9. *Security and Privacy in E-health Systems.* - A tutorial talk at *IEEE HealthCom*, Boston, MA, 2015.

## Conference Talks

S8. *Clinical Geriatric Functional Assessment using Wearable Sensing and Machine Learning*, *IEEE International Conference on E-health Networking, Application & Services (Healthcom)*, 2024

S9. *Exploiting Longitudinal Speech Sessions via Voice Assistant Systems for Early Detection of Cognitive Decline*, *IEEE International Conference on E-health Networking, Application & Services (Healthcom)*, 2024

S10. *Exploiting Privacy Preserving Prompt Techniques for Online Large Language Model Usage*, *IEEE Global Communications Conference (GLOBECOM)*, 2024

S11. *EPIC: Efficient Privacy-preserving Contact Tracing for Infection Detection. IEEE International Conference on Communications (ICC)*, Kansas City, MO 2018.

S12. *Privacy-preserving Time-sharing Services for Autonomous Vehicles. IEEE 86th Vehicular Technology Conference (VTC)-Fall*, Toronto, ON, Canada, 2017.

S13. *AuthoRing: Wearable User-presence Authentication. Workshop on Wearable Systems and Applications (WearSys)*, Niagara Falls, NY, 2017.

S14. *LightTouch: Securely Connecting Wearables to Ambient Displays with User Intent. IEEE International Conference on Computer Communications (INFOCOM)*, Atlanta, GA, 2017.

S15. *Towards Efficient and Privacy-preserving Location-based Comment Sharing. IEEE/CIC International Conference on Communications in China (ICCC)*, Chengdu, China, 2016.

S16. *Securely Connecting Wearable Health Devices to External Displays. — USENIX Summit on Health Information Technologies*, San Diego, CA, 2014.

S17. *SEER: A Secure and Efficient Service Review System for Service-Oriented Mobile Social Networks*, *International Conference on Distributed Computing Systems (ICDCS)*, Macau, China, 2012.

S18. *Exploiting Prediction to Enable Secure and Reliable Routing in Wireless Body Area Networks. IEEE International Conference on Computer Communications (INFOCOM)*, Orlando, FL, 2012.

S19. *PReFilter: A Privacy-preserving Relay Filtering Scheme for Delay Tolerant Networks. IEEE International Conference on Computer Communications (INFOCOM)*, Orlando, FL, 2012.

S20. *STAP: A Social-Tier-Assisted Packet Forwarding Protocol for Achieving Receiver-Location Privacy Preservation in VANETs. IEEE International Conference on Computer Communications (INFOCOM)*, Shanghai, China, 2011.

S21. *PEACE: An Efficient and Secure Patient-Centric Access Control Scheme for eHealth care system. INFOCOM-Security in Computers, Networking, and Communications (SCNC)*, Shanghai, China, 2011.

S22. *PPC: Privacy-preserving Chatting in Vehicular Peer-to-peer Networks. IEEE Vehicular Technology Conference (VTC)-Fall*, Ottawa, ON, Canada, 2010.

S23. *Provably Secure and Efficient Bounded Ciphertext Policy Attribute Based Encryption. ACM Symposium on Information, Computer and Communications Security (ASIACCS)*, Sydney, Australia, 2009.

S24. *Attribute Based Proxy Re-encryption with Delegating Capabilities. ASIACCS*, Sydney, Australia, 2009.

S25. *Short Group Signature without Random Oracles. International Conference on Information and Communications Security (ICICS)*, Zhengzhou, China, 2007.

## Research Experience

**University of Massachusetts Boston** Sep 2015-

- Weymouth Government "Implement Multi-Factor Authentication for Weymouth Town Services," 2025
- NIH/NIA P30-AG073104 (Pilot Award) "Geriatric Functional Assessment System Using Passive Wearable Sensing and Deep Learning," 2023-2025
- NIH/NIA R01 grant "SCH: INT: Collaborative Research: Exploiting Voice Assistant Systems for Early Detection of Cognitive Decline," 2019-2025
- NSF: NeTS: Towards Privacy-Preserving Autonomous Vehicle Sharing Services, 2016-2020
- Enhancing Security, Privacy and Characteristic Inference of Voice Assistant Systems, 2018-
- Wireless Signals and Channel State Information for Physical Sensing, 2016-
- Secure Wearable Applications, 2014-2017
- Security, Privacy, and Trustworthiness in Healthcare System, 2010-

**Dartmouth College** Jan 2014-Aug 2015

- Developing new efficient and secure communication techniques for emerging wearable health devices, implementing the proposed techniques using hardware compatible with wearable health devices, evaluating the performance and security properties in a physical environment, and testing the usability with extensive user studies. Python, C programming in Embedded System
- Exploiting effective and non-agnostic privacy preservation methods for wearable health technology. The goal is to minimize the information disclosure to the service providers while having the maximum desired health and fitness benefits for users. Implementation of machine learning algorithms using C in embedded system

**University of Waterloo, Canada** May 2009-Dec 2013

- Designed secure, efficient, and privacy-preserving communication techniques for mobile communication systems, such as, e-healthcare system, mobile social networks, and smart grid
- Simulated a mobile social network by using the real-trace data, implemented and validated the techniques in a simulated environment, Java programming in Linux
- Implemented Bluetooth communications between iPhone with CIM sensors, read and modified C# programs from Btstack open source
- Developed a Gesture-based Electronic naMecard application (GEM) in Android for users to share electronic namecards using their Smartphones with Gesture-based authentication adopted to ensure security.
- Maintained and updated both hardware and software for all computers, manage computer accounts, and assist each member to be familiar with facilities and research resources in the Broadband Communications Research (BBCR) Laboratory

**National Institute of Information and Communications Technology, Japan** Nov. 2008

- Visiting Theoretic Foundation Group and Exchanging research ideas

**Trusted Digital Technology Laboratory, Shanghai Jiao Tong University** Jul 2004-Jul 2006

- Designed secure, efficient, and privacy-preserving encryption and signature schemes and implemented attribute-based encryption algorithms, C++ programming in Linux

**Microsoft Research Asia, China** Jul 2005-Sep 2005

- Examined and analyzed Media Access Control Layer Misbehavior as a research intern in the Wireless and Networking Group

## Mentoring Experience

While on the faculty at the University of Massachusetts Boston:

PhDs:

- Sumukh Veeramalla, Ph.D. student under my supervision at UMB, Fall 2025-
  Exploiting Home VAS Data for Early Detection of Cognitive Decline
- Sankalp Vaish, Ph.D. student under my supervision at UMB, Spring 2025-
  An Enhanced Facial Authentication Approach: Optimized Preprocessing and Automated Filtering for Secure and Reliable Authentication
- Rishank Singh, Ph.D. student under my supervision at UMB, Fall 2024-
  Develop Wearable Solutions for Physical Function Assessments on Older Adults
  Led our team to successfully finish the MIT I-corps Spark Program, 2024
- Kristin Qi, Ph.D. student under my supervision at UMB, Fall 2023-
  Speech Analysis for Early Detection of Cognitive Decline
- Youxiang Zhu, Ph.D. student under my supervision at UMB, Fall 2020-
  Speech Analysis for Early Detection of Cognitive Decline
  Received Oracle Fellowship, Fall 2023 and Spring 2024.
- (Alumni) Karmesh Siddharam Chaudhari, Ph.D. student under my supervision at UMB, Fall 2024 - Spring 2025
  Assessing Privacy Preservation and Utility in Online Vision-Language Models
- (Alumni) Nana Lin, Ph.D. student under my supervision at UMB, Spring 2023-Spring 2025
  Thesis: Multimodal Learning in Real-world Application: Enhancing Feature Representation and Training Strategies
- (Alumni) Bang Tran, Ph.D student under my supervision at UMB, Spring 2019-Spring 2023
  Initial position: *Tenure-track assistant professor at Assumption University, MA*
  Thesis: Enhancing Security and privacy for Voice Assistant Systems Security and Privacy of Smart Home and Voice Assistant Systems
- (Alumni) Mohammad Hadian, obtained Ph.D degree under my supervision at UMB, Spring 2016-Spring 2019
  Initial position: *Visiting assistant professor at Clark University, MA*
  Thesis: Enhancing User-oriented Security and Privacy in Emerging Data Sharing and Sensing Services
- (Alumni) Thamer AlTuwaiyan, obtained Ph.D degree under my supervision at UMB, Fall 2015-Spring 2019
  Initial position: *Tenure-track assistant professor at Shaqra University*
  Thesis: Toward Data Privacy Related to the Internet of Things

Master's students:

- (Converted to PhD) Sumukh Veeramalla: Fall 2024-Spring 2025. Master's student under my supervision at UMB. His research focuses on developing the CogVox Dashboard and a Food Recall app using Voice and Visual AI
- (Alumni) Abdelrahman Obyat: Fall 2021. He managed voice data downloading and storage. He published a paper as a co-author.
- (Alumni) Rahul Nagesh: Fall 2021. He helped set up the voice collection protocol for phase 2 of the VAS project.
- (Alumni) Eli Kurtz: Spring 2023. His research focuses on analyzing the 90 older adults' Alexa commands to detect their cognitive levels. He published a research paper as the first author.
  Initial position: *Graduate Fellow at Los Alamos National Laboratory*
- (Alumni) Sai Harshavardhan Reddy Kona: Fall 2022 - Spring 2023. His research focuses on privacy protection of voice-based services. He published a paper as a co-author.
- (Alumni) Chenjun Li: Fall 2018-Fall 2020.
  Initial position: *Software Engineer at Harvard Pilgrim Health Care*

Undergraduate students:

- Shenhui Pan: Fall 2020. He published a paper as a co-author. The paper won the Best Paper Award at the IEEE ICC conference 2021.
- Jing Yuan: Fall 2021 - Spring 2022. She received CS Fellowships in each of the two semesters. Her research focuses on "Developing Voice-based Dietary Assessment via Voice Assistants" and "Improving Voice-based Dietary Assessment Method." She published one first-author paper and another as a co-author.
- Shiyong Li: Fall 2021. He received the CSM Undergraduate Research Fellowship. His research focuses on Wizard-of-Oz experiments on voice-based food assessment.
- Josh Schultz: Spring 2022 - Summer 2022, and received the Beacons Student Success Fellowship. His research focuses on developing a voice platform and conducting experiments on voice-based food assessment.
- Jongsoo Ha: Fall 2024 - Spring 2025. He received CSM Undergraduate Research Fellowships in each of the two semesters. His research focuses on "Watermark on LLM for code generation" and "Watermarked Sequence Length Code Generation for Large Language Model."

While working at Dartmouth College:

- Aarathi Prasad, obtained Ph.D degree at Dartmouth College, (THaW project) Jan 2014-Aug 2015
  Initial position: *Tenure-track assistant professor at Skidmore College*
  Exploiting trustworthy issues in mobile healthcare applications, focusing on how to balance the benefits and privacy risks of sharing health information with service providers, and developing methods to preserve user privacy while minimizing user effort and maximizing the benefits
- Timothy Pierson, obtained Ph.D. degree at Dartmouth College, (THaW project) Jan 2014-Aug 2015
  Initial position: *Research Assistant Professor at Dartmouth College*
  Exploiting security issues of medical device management in small health networks in which most operations and updates need to be done by clinicians or users with limited IT knowledge
- Tianlong Yun, obtained Master degree at Dartmouth College, Jan 2014-Aug 2015
  Initial position: *Software Engineer at tbDEX*
  Developing a fitness tracking application using wearable health technology

While at the University of Waterloo:

- Nan Chen, was an undergraduate exchange student at the University of Waterloo Sep 2013-Dec 2014
  Initial position: *Tenure-track assistant professor at Tennessee Technological University*
  A survey of big data analysis and energy efficiency for e-healthcare
- Wei Zhang, was an undergraduate co-op student at the University of Waterloo Jan 2012-Jul 2012
  Implement Bluetooth communication between iPhone/iPod and CIM devices
- Bin Liu, was an undergraduate exchange student at the University of Waterloo Sep 2009-Dec 2009
  Implement an attribute-based encryption system for e-healthcare system
- Jianqiao Shao, was an undergraduate co-op student at the University of Waterloo May 2009-Sep 2009
  An investigation on research of e-health system security

## Teaching Experience

| | |
|---|---|
| CS480/697 Speech and Language Processing, UMB | Spring 2024 |
| CS413/613 Applied Cryptography, UMB | Spring/2019-2025 |
| CS442/642 Cybersecurity in the Internet of Things, UMB | Spring 2018/2019/2020, Fall 2021/2023/2024 |
| IT443 Network Security Administration, UMB | Spring 2016/2017, Fall 2017/2018, Spring 2021 |

| | |
|---|---|
| CS 240 Programming in C, UMB | Spring 2017/2018, Fall 2019 |
| CS187 Science Gateway Seminar, UMB | Fall 2015 |

## Internal Services

*University-level*:

*Institutional Review Board (IRB) Committee* 2018-
Participating monthly IRB meetings and reviewing human subject protocols in research projects

*Panelist* on Design Next-Generation, Useful, and Usable Digital Health Technologies at University of Massachusetts "zoom summit" in Data-Driven and Technology-Informed Precision Health 2021

*Panelist* on Trustworthy AI systems at University of Massachusetts "zoom summit" in Artificial Intelligence, Robotics and Data Science 2021

*Panelist* at a UMB AI Institute Event "AI for All: Access, Equity, & Action." 2024

*College-level*:

*Academic Affairs Committee* 2019-2021
Reviewing and recommending all new course proposals and all proposals for changes in existing undergraduate courses and course credits.

*Department-level:*

*Interim chair* Fall 2023 and Spring/Summer 2025
Maintaining open communication with the Executive Committee to ensure transparency and fairness; collaborating with staff and faculty to optimize course scheduling and teaching assignments; leading productive department meetings, facilitating collaboration and addressing key issues; emphasizing the importance of grant activity and RTF contributions; launching a new faculty seminar series to encourage research collaboration; coordinating activities of faculty promotions, annual reviews, and grant and award submissions; and working with the AI institute to support student activities, including serving as a panelist, judge, and planner.

*Associate Chair* 2023-
Providing support to the Chair in executing and keeping track of the administrative tasks that are central to the operation and continuous improvement of the Department.

*Search Committee Chair* Spring 2025
Coordinating search committee members in reviewing NTT and TT candidates, leading to the successful hires of one NTT and two TT faculty members.

*Personnel Committee* 2019-2023
Reviewing annual faculty report and reappointment through the tenure decision year (fourth-year review), tenure, promotion to the rank of associate professor, and promotion to senior rank.

*Industrial Advisory Board Committee* 2021
Organizing Industrial Advisory Board and presenting Research highlights.

## External Services

### Committee

- Secretary of the IEEE Communications and Information Security Technical Committee (CISTC), 2024-2026

### Membership

- ACM Member (2014-), IEEE Member (S'09, M'14, SM'20), ISCA Member (2020-)
- IEEE Young Professionals (2013-), IEEE Communications Society Member (2009-), IEEE Signal Processing Society (2021-), IEEE Computer Society Technical Committee on Scalable Computing (2017-), IEEE Vehicular Technology Society (2019-)

### Editors

- Associate Editor of Speech Communication, European Association for Signal Processing (EURASIP), 2025-
- Associate Editor in Human-Media Interaction, Frontiers in Computer Science, 2022-
- Associate Editor of IEEE Internet of Things 2019-2024
- Guest Editor, "Data Processing, Privacy and Security Challenges for Fog and Cloud Computing in the Internet of Things," Sensors MDPI 2025

- Guest Editor, "Protecting Privacy in Neuroimaging Analysis: Balancing Data Sharing and Privacy Preservation," Frontiers in Neuroinformatics, 2023
- Guest Editor, "Security in Medical Cyber-Physical Systems," Smart Health (Elsevier), 2017

### Chairs

- Program co-chair of IEEE Healthcom 2026
- Program co-chair of Security, Privacy, and Trust Track for IEEE MetaCom 2025
- Program co-chair of Emerging Technologies and Trends Track for IEEE 21st Annual International Conference on Privacy, Security, and Trust (PST), 2024
- Program chair of e-Health Track for IEEE ICC 2022
- Program co-chair of Security Track for IEEE International Conference on Parallel and Distributed Systems (ICPADS), 2020
- Program co-chair of the IEEE International Workshop on Security, Privacy, and Trustworthiness in Medical Cyber-Physical Systems (MedSPT), 2016
- Local co-chair of International Conference on E-health Networking, Application, Services (Healthcom) 2016
- Publicity co-chair of IEEE Communication and Network Security 2025,
- Publicity co-chair of ICC Workshop on Secure Networking and Forensic Computing 2014
- Publicity co-chair of INFOCOM workshop on Security in Computers, Networking and Communications 2011

### Technique Program Committee

- INFOCOM 2016, 2017, 2021-2023
- GLOBECOM 2013, 2016-2019
- ICC 2014, 2018, 2021-2022, 2024
- ICCC 2023
- CNS 2022-2023

### Reviewer for Journals

- ACM Transactions on Computing for Healthcare
- ACM Computing Survey
- ACM Springer Mobile Networks and Applications (MONET)
- IEEE Journal on Selected Areas of Communications (JSAC)
- IEEE/ACM Transactions on Networking (TON)
- IEEE Communication Magazine (CommMag)
- IEEE Network Magazine (NetMag)
- IEEE Wireless Communications (WirelessMag)
- IEEE Transactions on Mobile Computing (TMC)
- IEEE Transactions on Parallel and Distributed Systems (TPDS)
- IEEE Transactions on Vehicular Technology (TVT)
- IEEE Transactions on Wireless Communications (TWC)
- IEEE Transactions on Smart Grid (TSG)
- IEEE Internet of Things Journal (IoT)
- IEEE Sensor Journal (Sensor)
- Pervasive and Mobile Computing (PMC)
- KSII Transactions on Internet and Information Systems

**NSF Panelist** 2015, 2017, 2021 2025