Dr. Panagiotis (Panos) Markopoulos, PhD

Associate Professor
Cloud Technology Endowed Fellow
Departments of Computer Engineering and Computer Science
College of AI, Cyber and Computing (CAICC)
The University of Texas at San Antonio

Contact Information

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Areas of Expertise

My areas of expertise are in **Machine Learning, Artificial Intelligence, and Signal Processing**. My research focuses on the design of *reliable learning systems that operate under real-world constraints and in critical applications*. I develop theory and algorithms for learning that are *robust to challenging data* (e.g., contaminated, limited, imbalanced, missing, multimodal), *adaptive to dynamic environments*, and *efficient in both computation and sample usage*. My work integrates machine learning, numerical and stochastic optimization, and signal processing to advance real-world intelligent systems.

Foundational Research Areas (development of theory and algorithms):

- Robust learning under data corruption and adversarial contamination
- Learning from heterogeneous, distributed, and privacy-constrained data
- Federated and decentralized learning systems
- Adaptive and continual learning in non-stationary environments
- Computational and data efficiency in large-scale learning
- Multimodal learning and structured data fusion
- Intelligent wireless communication systems and physical-layer signal processing
- Quantum and quantum-inspired optimization for machine learning

Application Domains:

- Computer Vision and Image Processing
- Remote Sensing
- Cybersecurity
- Computational Healthcare
- Wireless Communication Systems

Education

Ph.D., Electrical Engineering, University at Buffalo, The State University of New York, 2015. *Dissertation:* Optimal Algorithms for L1-norm Principal Component Analysis: New Tools for Signal Processing and Machine Learning with Few and Faulty Training Data

M.S., Electronic and Computer Engineering, Technical University of Crete, Chania, Greece, 2012. *Thesis:* Full-rate Differential M-PSK Alamouti Modulation with Polynomial-complexity Maximum-likelihood Noncoherent Detection

Engineering Diploma (five-year program) in Electronic and Computer Engineering, Technical University of Crete, Chania, Greece, 2010. *Thesis:* Maximum-Likelihood Noncoherent M-PSK OSTBC Detection with Polynomial Complexity

Professional Positions

Associate Professor and Cloud Technology Endowed Fellow (2025 - Present)
Departments of Computer Engineering (CE) and Computer Science (CS)
College of AI, Cyber, and Computing (CAICC)
The University of Texas at San Antonio
Concurrent roles:

- Lead, AI Systems research thrust, Department of Computer Engineering, 2025 - Present.
- Lead, Trustworthy AI Thrust, MATRIX: UT San Antonio AI Consortium for Human Well-Being, 2024 - Present
- Founding Director, UT San Antonio Machine Learning Optimization and Systems (MILOS) Laboratory, 2022 - Present
- Graduate Program in Biomedical Engineering (jointly offered by UT San Antonio Main Campus and UT San Antonio Health Science Center), 2025 - Present.

In September 2025, The University of Texas at San Antonio established the College of AI, Cyber, and Computing (CAICC). The former Department of Electrical and Computer Engineering was divided into Electrical Engineering (EE), which remained in the Klesse College of Engineering and Integrated Design, and Computer Engineering (CE), which joined CAICC. In recognition of my AI expertise, I was invited to join CAICC and CE as inaugural faculty and was appointed Cloud Technology Endowed Fellow by the Office of the Provost.

Associate Professor and Margie and Bill Klesse Endowed Professor (2022-2025)
Departments of Electrical and Computer Engineering (ECE) and Computer Science (CS)
Klesse College of Engineering and Integrated Design (KCEID)
The University of Texas at San Antonio
Concurrent roles:

- Chair, ECE Digital Signal Processing Concentration
- Lead, Trustworthy AI Thrust, MATRIX UTSA AI Consortium for Human Well-Being
- Founding Director, Machine Learning Optimization Laboratory

- Founding Director, Multi-modal Sensing and Signal Processing (MSSP) Laboratory

Associate Professor with Tenure (2021-2022)
Department of Electrical and Microelectronic Engineering (EME)
Kate Gleason College of Engineering (KGCOE)
Rochester Institute of Technology (RIT)
Concurrent roles:

- Founding Director, Machine Learning Optimization and Signal Processing (MILOS) Lab
- Core Faculty, Center for Human-aware Artificial Intelligence (CHAI)
- Extended Faculty, Ph.D. Program in Computing and Information Sciences
- Extended Faculty, Ph.D. Program in Mathematical Modeling
- Member, RIT Faculty Senate, 2021 to 2022

Assistant Professor (2015-2021)
Department of Electrical and Microelectronic Engineering (EME)
Kate Gleason College of Engineering (KGCOE)
Rochester Institute of Technology (RIT)

Visiting Faculty - Independent Contractor (Summers 2018, 2020, 2021)
U.S. Air Force Research Laboratory, Information Directorate, Rome, NY,
Graduate Research Assistant (2011 to 2015)
Department of Electrical Engineering (EE)
University at Buffalo, The State University of New York

Research and Scholarship

Research Areas

Foundational Research Areas:

- Robust learning under data corruption and adversarial contamination
- Learning from heterogeneous, distributed, and privacy-constrained data
- Federated and decentralized learning systems
- Adaptive and continual learning in non-stationary environments
- Computational and data efficiency in large-scale learning
- Multimodal learning and structured data fusion
- Intelligent wireless communication systems and physical-layer signal processing
- Quantum and quantum-inspired optimization for machine learning

Application Domains:

- Wireless Communication Systems: physical-layer modulation, transmit/receive beamforming, interference suppression, direction-of-arrival estimation, radar signal processing
- Computer Vision: image classification, object detection and tracking

- Remote Sensing: hyperspectral, SAR, and electro-optical imagery; modality fusion; segmentation; object detection and tracking
- Cybersecurity: anomaly detection, adversarial robustness, secure learning under attack
- Computational Healthcare: decision support and computational diagnostics

Research Articles

Journal Articles

1. Federated Learning With Automated Dual-Level Hyperparameter Tuning
   R. U. Haque and P. P. Markopoulos
   IEEE Open Journal of Signal Processing, vol. 6, pp. 795–802, June 2025. Open Access.
   DOI: https://doi.org/10.1109/OJSP.2025.3578273

2. Convolutional Neural Network Compression via Dynamic Parameter Rank Pruning
   M. Sharma, J. Heard, E. Saber, and P. Markopoulos
   IEEE Access, vol. 13, pp. 18441-18456, 2025.
   DOI: https://doi.org/10.1109/ACCESS.2025.3533419

3. Quantum Annealing for Robust Principal Component Analysis
   I. Tomeo, P. P. Markopoulos, and A. Savakis
   arXiv:2501.10431v2 [cs.ET], January 2025.
   DOI: https://arxiv.org/abs/2501.10431v2

4. Regulating Modality Utilization within Multimodal Fusion Networks
   S. Singh, E. Saber, P. P. Markopoulos, and J. Heard
   Sensors, vol. 24, no. 6054, September 2024.
   DOI: https://doi.org/10.3390/s24186054

5. Joint Analysis and Segmentation of Time-varying Data with Outliers
   S. Colonnese, G. Scarano, M. Marra, P. P. Markopoulos, and D. A. Pados
   Digital Signal Processing (Elsevier), vol. 145, no. 104338, February 2024.
   DOI: https://doi.org/10.1016/j.dsp.2023.104338

6. On the Asymptotic L1-PC of Elliptical Distributions
   M. Dhanaraj and P. P. Markopoulos
   IEEE Signal Processing Letters, vol. 29, pp. 2343-2347, September 2022.
   DOI: https://doi.org/10.1109/LSP.2022.3205274

7. FFT Calculation of the L1-norm Principal Component of a Data Matrix
   S. Colonnese, P. P. Markopoulos, G. Scarano, and D. A. Pados
   Signal Processing, vol. 189, no. 108286, August 2021.
   DOI: https://doi.org/10.1016/j.sigpro.2021.108286

8. Minimum Mean-Squared-Error Autocorrelation Processing in Coprime Arrays

D. G. Chachlakis, T. Zhou, F. Ahmad, and P. P. Markopoulos
Digital Signal Processing, vol. 114, no. 103034, July 2021.
DOI: https://doi.org/10.1016/j.dsp.2021.103034

9. Dynamic L1-norm Tucker Tensor Decomposition
   D. G. Chachlakis, M. Dhanaraj, A. Prater-Bennette, and P. P. Markopoulos
   IEEE Journal of Selected Topics in Signal Processing, vol. 15, no. 3, pp. 587-602, April 2021.
   DOI: https://doi.org/10.1109/JSTSP.2021.3058846

10. Structured Autocorrelation Matrix Estimation for Coprime Arrays
    D. G. Chachlakis and P. P. Markopoulos
    Signal Processing, vol. 183, no. 107987, June 2021.
    DOI: https://doi.org/10.1016/j.sigpro.2021.107987

11. YOLOrs: Object Detection in Multimodal Remote Sensing Imagery
    M. Sharma, M. Dhanaraj, D. G. Chachlakis, S. Karam, R. Ptucha, P. P. Markopoulos, E. Saber
    IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing, vol. 14, pp. 1497-1508, November 2021.
    DOI: https://doi.org/10.1109/JSTARS.2020.3041316

12. Reduced-Rank L1-Norm Principal-Component Analysis with Performance Guarantees
    H. Kamrani, A. Zoghadr Asli, P. P. Markopoulos M. Langberg, D. A. Pados, and G. N. Karystinos
    IEEE Transactions on Signal Processing, vol. 69, pp. 240-255, November 2020.
    DOI: https://doi.org/10.1109/TSP.2020.3039599

13. NASCon: Network-Aware Server Consolidation for Server-Centric Wireless Datacenters
    S. A. Mamun, A. Ganguly, P. P. Markopoulos, M. Kwon, and A. Kwasinski
    Sustainable Computing: Informatics and Systems, vol. 29 (part A), no. 100452, March 2021.
    DOI: https://doi.org/10.1016/j.suscom.2020.100452

14. L1-Norm Tucker Tensor Decomposition
    D. G. Chachlakis, P. P. Markopoulos, and A. Prater-Bennette
    IEEE Access, vol. 7, pp. 178454-178465, November 2019.
    DOI: https://doi.org/10.1109/ACCESS.2019.2955134

15. Spatial-Spectral Segmentation of Hyperspectral Images for Subpixel Target Detection
    Y. Liang, P. P. Markopoulos, and E. Saber
    SPIE Journal of Applied Remote Sensing, vol. 13, no. 3, pp. 036502:1-036502:16, July 2019.
    DOI: https://doi.org/10.1117/1.JRS.13.036502

16. Realified L1-PCA for Direction-of-Arrival Estimation: Theory and Algorithms
    P. P. Markopoulos, N. Tsagkarakis, D. A. Pados, and G. N. Karystinos
    EURASIP Journal on Advances in Signal Processing, no. 30, June 2019.
    DOI: https://doi.org/10.1186/s13634-019-0625-5

17. Adaptive Radar-Based Human Activity Recognition with L1-norm Linear Discriminant Analysis
    P. P. Markopoulos, S. Zlotnikov, and F. Ahmad
    IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology, vol. 3, no. 2, pp. 120-126, June 2019.
    DOI: https://doi.org/10.1109/JERM.2019.2893587

18. Adaptive L1-Norm Principal-Component Analysis with Online Outlier Rejection
    P. P. Markopoulos, M. Dhanaraj, and A. Savakis
    IEEE Journal of Selected Topics in Signal Processing, vol. 12, no. 6, pp. 1131-1143, December 2018.
    DOI: https://doi.org/10.1109/JSTSP.2018.2874165

19. L1-Norm Principal-Component Analysis of Complex Data
    N. Tsagkarakis, P. P. Markopoulos, and D. A. Pados
    IEEE Transactions on Signal Processing, vol. 66, no. 12, pp. 3256-3267, June 2018.
    DOI: https://doi.org/10.1109/TSP.2018.2821641

20. The Exact Solution to Rank-1 L1-Norm TUCKER2 Decomposition
    P. P. Markopoulos, D. G. Chachlakis, and E. E. Papalexakis
    IEEE Signal Processing Letters, vol. 25, no. 4, pp. 511-515, April 2018.
    DOI: https://doi.org/10.1109/LSP.2018.2790901

21. Noncoherent Alamouti Phase-Shift Keying with Full-Rate Encoding and Polynomial-Complexity Maximum-Likelihood Decoding
    P. P. Markopoulos and G. N. Karystinos
    IEEE Transactions on Wireless Communications, vol. 16, no. 10, pp. 6688-6697, July 2017.
    DOI: https://doi.org/10.1109/TWC.2017.2728524

22. Efficient L1-Norm Principal-Component Analysis via Bit Flipping
    P. P. Markopoulos, S. Kundu, S. Chamadia, and D. A. Pados
    IEEE Transactions on Signal Processing, vol. 65, no. 16, pp. 4252-4264, August 2017.
    DOI: https://doi.org/10.1109/TSP.2017.2708023

23. Optimal Algorithms for L1-Subspace Signal Processing
    P. P. Markopoulos, G. N. Karystinos, and D. A. Pados
    IEEE Transactions on Signal Processing, vol. 62, no. 19, pp. 5046-5058, October 2014.
    DOI: https://doi.org/10.1109/TSP.2014.2338077

24. Small-Sample-Support Suppression of Interference to PN-Masked Data
    P. P. Markopoulos, S. Kundu, and D. A. Pados
    IEEE Transactions on Communications, vol. 61, no. 7, pp. 2979-2987, July 2013.
    DOI: https://doi.org/10.1109/TCOMM.2013.043013.120643

25. Building a Low-Cost Digital Garden as a Telecom Lab Exercise
    Bletsas, A. Vlachaki, E. Kampianakis, G. Sklivanitis, J. Kimionis, K. Tountas, M. Asteris, and P. P. Markopoulos
    IEEE Pervasive Computing, vol. 12, no. 1, pp. 48-57, January 2013.
    DOI: https://doi.org/10.1109/MPRV.2011.83

Conference Proceeding Articles

1. Robust Federated Learning via Stable Cosine Similarity
   R. U. Haque and P. Markopoulos
   in Proc. 2025 IEEE International Carnahan Conference on Security Technology (ICCST)
   Paper received the Distinguished Conference Paper Award

2. LG-XLR: Loss-Guided Exponential Learning Rate Adaptation
   R. U. Haque and P. Markopoulos
   in Proc. 2025 IEEE International Conference on Digital Signal Processing (DSP), pp. 1-5, 2025.
   DOI: https://doi.org/10.1109/DSP65409.2025.11075054

3. Robust Interbattery Factor Analysis by Uniform Sample Contributions
   I. Tomeo, P. P. Markopoulos, and A. Savakis
   Signal Processing, Sensor/Information Fusion, and Target Recognition XXXIV, Proc. SPIE 13479, pp. 384-390, May 2025.
   DOI: https://doi.org/10.1117/12.3058624

4. Image Preprocessing and YOLO Architectures for Enhanced Small and Slow-Moving Object Detection
   D. Velychko, S. Singh, P. P. Markopoulos, E. Saber, and J. Heard
   in Proc. 2024 IEEE Western New York Image and Signal Processing Workshop (WNYISPW), pp. 1-4, November 2024.
   DOI: https://doi.org/10.1109/WNYISPW63690.2024.10786503

5. Continual Learning in Convolutional Neural Networks with Tensor Rank Updates
   M. Krol, R. Hyder, M. Peechatt, A. Prater-Bennette, M. S. Asif, and P. P. Markopoulos
   in Proc. 2024 IEEE 13rd Sensor Array and Multichannel Signal Processing Workshop (SAM), pp. 1-5, 2024.
   DOI: https://doi.org/10.1109/SAM60225.2024.10636545

6. L1-PCA with Quantum Annealing
   I. Tomeo, P. P. Markopoulos, and A. Savakis

in Proc. SPIE 13036, Big Data VI: Learning, Analytics, and Applications, National Harbor, MD, April, 2024, p. 1303605.
DOI: https://doi.org/10.1117/12.3015944

7. Adaptive Federated Learning for Automatic Modulation Classification Under Class and Noise Imbalance
J. A. Sanchez Viloria, D. Stripelis, P. P. Markopoulos, G. Sklivanitis, and D. A. Pados
in Proc. AAAI 2024 Spring Symp. Series, Stanford University, Stanford, CA, March 2024, p. 309.
DOI: https://doi.org/10.1609/aaaiss.v3i1.31223

8. Measuring Modality Utilization in Multi-Modal Neural Networks
S. Singh, P. P. Markopoulos, E. Saber, J. D. Lew, and J. Heard
in Proc. IEEE Conference on Artificial Intelligence (IEEE CAI), Santa Clara, CA, June 2023, pp. 11-14.
DOI: https://doi.org/10.1109/CAI54212.2023.00014

9. Multimodal aerial view object classification with disjoint unimodal feature extraction and fully-connected-layer fusion
S. Singh, M. Sharma, J. Heard, J. D. Lew, E. Saber, and P. P. Markopoulos
in Proc. SPIE 12522, Big Data V: Learning, Analytics, and Applications, Orlando, FL, April 2023, p. 1252206.
DOI: https://doi.org/10.1117/12.2664041

10. HDA: an iterative hyperplane-search method for discriminant analysis
I. Tomeo and P. P. Markopoulos
in Proc. SPIE 12538, Artificial Intelligence and Machine Learning for Multi-Domain Operations Applications V, Orlando, FL, April 2023, p. 125381U.
DOI: https://doi.org/10.1117/12.2664331

11. Robust Singular Values based on L1-norm PCA
D. H. Le and P. P. Markopoulos
in Proc. IEEE Workshop on Signal Processing Systems (IEEE SiPS), Rennes, France, November 2022, pp. 1-6.
DOI: https://doi.org/10.1109/SiPS55645.2022.9919215

12. Robust Stochastic Principal Component Analysis via Barron Loss
M. Dhanaraj and P. P. Markopoulos
in Proc. IEEE Asilomar Conference on Signals, Systems, and Computers (IEEE ACSSC), Pacific Grove, CA, October 2022, pp. 1286-1290.
DOI: https://doi.org/10.1109/IEEECONF56349.2022.10051902

13. Incremental Task Learning with Incremental Rank Updates
R. Hyder, K. Shao, B. Hou, P. P. Markopoulos, A. Prater-Bennette, and M. S. Asif

in Proc. European Conference on Computer Vision (ECCV), Tel Aviv, Israel, October 2022, pp. 566-582.
DOI: https://doi.org/10.1007/978-3-031-20050-2_34

14. Convolutional Auto-Encoder with Tensor-Train Factorization
M. Sharma, P. P. Markopoulos, E. Saber, M. S. Asif, and A. Prater-Bennette
in Proc. International Conference on Computer Vision (ICCV), Montreal, QC, Canada, October 2021, pp. 198-206.
DOI: https://doi.org/10.1109/ICCVW54120.2021.00027

15. Improved L1-Tucker via L1-Fitting
M. Mozaffari, P. P. Markopoulos, and A. Prater-Bennette
in Proc. European Signal Processing Conference (EUSIPCO), Dublin, Ireland, August 2021, pp. 1075-1079.
DOI: https://doi.org/10.23919/EUSIPCO54536.2021.9616014

16. Robust Barron-Loss Tucker Tensor Decomposition
M. Mozaffari and P. P. Markopoulos
in Proc. IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, October 2021, pp. 1651-1655.
DOI: https://doi.org/10.1109/IEEECONF53345.2021.9723232

17. YOLOrs-LITE: A Lightweight CNN for Real-time Object Detection in Remote Sensing
M. Sharma, P. P. Markopoulos, and E. Saber
in Proc. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Brussels, Belgium, July 2021, pp. 2604-2607.
DOI: https://doi.org/10.1109/IGARSS47720.2021.9554418

18. Novel Algorithms for Lp-quasi-norm Principal-Component Analysis
D. G. Chachlakis and P. P. Markopoulos
in Proc. European Signal Processing Conference (EUSIPCO), Amsterdam, Netherlands, January 2021, pp. 1045-1049.
DOI: https://doi.org/10.23919/Eusipco47968.2020.9287335

19. What Can Ail Thee: New and Old Security Vulnerabilities of Wireless Datacenters
S. A. Mamun, A. Ganguly, P. P. Markopoulos, A. Kwasinski, and M. Kwon
in Proc. IEEE Global Communications Conference (GLOBECOM), Taipei, Taiwan, December 2020, pp. 1-7.
DOI: https://doi.org/10.1109/GLOBECOM42002.2020.9322619

20. Robust Graph Localization for Underwater Acoustic Networks
G. Sklivanitis, P. P. Markopoulos, D. A. Pados, and R. Diamant
in Proc. IEEE Underwater Communications and Networking Conference (UComms), Lerici, Italy, August 2021, pp. 1-5.
DOI: https://doi.org/10.1109/UComms50339.2021.9598114

21. L1-Norm RESCAL Decomposition
    Y. Tsitsikas, D. G. Chachlakis, E. Papalexakis, P. P. Markopoulos
    in Proc. IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2020, pp. 940-944.
    DOI: https://doi.org/10.1109/IEEECONF51394.2020.9443401

22. L1-Norm Higher-order Orthogonal Iterations for Robust Tensor Analysis
    D. Chachlakis, A. Prater-Bennette, and P. P. Markopoulos
    in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Barcelona, Spain, May 2020, pp. 4826-4830.
    DOI: https://doi.org/10.1109/ICASSP40776.2020.9053701

23. Vehicle Detection from Multi-modal Aerial Imagery Using YOLOv3 with Mid-level Fusion
    M. Dhanaraj, M. Sharma, T. Sarkar, S. Karnam, D. G. Chachlakis, R. Ptucha, P. P. Markopoulos, and E. Saber
    in Proc. SPIE 11395, Big Data II: Learning, Analytics, and Applications, Anaheim, CA, April 2020, p. 1139506.
    DOI: https://doi.org/10.1117/12.2558115

24. Iteratively Re-weighted L1-norm PCA of Tensor Data
    K. Tountas, D. G. Chachlakis, P. P. Markopoulos, and D. A. Pados
    in Proc. IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, October 2019, pp. 1658-1661.
    DOI: https://doi.org/10.1109/IEEECONF44664.2019.9048775

25. Combinatorial Search for the Lp-Norm Principal Component of a Matrix
    D. G. Chachlakis and P. P. Markopoulos
    in Proc. IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, October 2019, pp. 1611-1615.
    DOI: https://doi.org/10.1109/IEEECONF44664.2019.9048980

26. Network-Aware Server Consolidation for Wireless Data Centers
    S. A. Mamun, A. Ganguly, M. Kwon, A. Kwasinski, and P. P. Markopoulos
    in Proc. International Conference on Networks of the Future (NoF), Rome, Italy, October 2019, pp. 58-65.
    DOI: https://doi.org/10.1109/NoF47743.2019.9014979

27. Robust Multi-Relational Learning with Absolute Projection RESCAL
    D. Chachlakis, Y. Tsitsikas, E. Papalexakis, and P. P. Markopoulos
    in Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP), Ottawa, ON, Canada, November 2019, pp. 1-5.
    DOI: https://doi.org/10.1109/GlobalSIP45357.2019.8969097

28. Stochastic Principal Component Analysis via Mean Absolute Projection Maximization
    M. Dhanaraj and P. P. Markopoulos
    in Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP), Ottawa, ON, Canada, November 2019, pp. 1-5.
    DOI: https://doi.org/10.1109/GlobalSIP45357.2019.8969411

29. Deep L1-PCA of Time-Variant Data with Application to Brain Connectivity Measurements
    G. Orrù, T. Cattai, S. Colonnese, G. Scarano, F. De Vico Fallani, P. P. Markopoulos, and D. A. Pados
    in Proc. European Signal Processing Conference (EUSIPCO), A Coruna, Spain, September 2019, pp. 1-5.
    DOI: https://doi.org/10.23919/EUSIPCO.2019.8903169

30. Options for Multimodal Classification Based on L1-Tucker Decomposition
    D. G. Chachlakis, M. Dhanaraj, P. P. Markopoulos, and A. Prater-Bennette
    in Proc. SPIE 10989, Big Data: Learning, Analytics, and Applications, Baltimore, MD, April 2019, 109890O.
    DOI: https://doi.org/10.1117/12.2520140

31. Incremental L1-Norm Linear Discriminant Analysis for Indoor Human Activity Classification
    S. Zlotnikov, P. P. Markopoulos, and F. Ahmad
    in Proc. IEEE Radar Conference (RadarConf), Boston, MA, April 2019, pp. 1-4.
    DOI: https://doi.org/10.1109/RADAR.2019.8835593

32. L1-Norm Higher-Order Singular-Value Decomposition
    P. P. Markopoulos, D. G. Chachlakis, and A. Prater-Bennette
    in Proc. IEEE Global Conference on Signal and Information Processing (GlobalSIP), Anaheim, CA, November 2018, pp. 1353-1357.
    DOI: https://doi.org/10.1109/GlobalSIP.2018.8646384

33. Gait Recognition Based on Tensor Analysis of Acceleration Data from Wearable Sensors
    K. Bichave, O. Brewer, M. Gusinov, P. P. Markopoulos, and I. Puchades
    in Proc. IEEE Western New York Image and Signal Processing Workshop (WNYISPW), Rochester, NY, USA, October 2018, pp. 1-5.
    DOI: https://doi.org/10.1109/WNYIPW.2018.8576383
    Best Poster Award Runner-up

34. Incremental Complex L1-PCA for Direction-of-Arrival Estimation
    M. Dhanaraj, D. G. Chachlakis, and P. P. Markopoulos
    in Proc. IEEE Western New York Image and Signal Processing Workshop (WNYISPW), Rochester, NY, October 2018, pp. 1-5.
    DOI: https://doi.org/10.1109/WNYIPW.2018.8576444

35. Semi-Blind Signal Recovery in Impulsive Noise with L1-Norm PCA
    Gannon, G. Sklivanitis, P. P. Markopoulos, D. A. Pados, and S. N. Batalama
    in Proc. IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, October 2018, pp. 477-481.
    DOI: https://doi.org/10.1109/ACSSC.2018.8645514

36. Novel Algorithm for Incremental L1-Norm Principal-Component Analysis
    M. Dhanaraj and P. P. Markopoulos
    in Proc. European Signal Processing Conference (EUSIPCO), Rome, Italy, September 2018, pp. 2020-2024.
    DOI: https://doi.org/10.23919/EUSIPCO.2018.8553234

37. Robust Radar-Based Human Motion Recognition with L1-Norm Linear Discriminant Analysis
    P. P. Markopoulos and F. Ahmad
    in Proc. IEEE International Microwave Biomedical Conference (IMBioC), Philadelphia, PA, USA, June 2018, pp. 145-147.
    DOI: https://doi.org/10.1109/IMBIOC.2018.8428927

38. MMSE-Based Autocorrelation Sampling for Coprime Arrays
    D. G. Chachlakis, P. P. Markopoulos, and F. Ahmad
    in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Calgary, AB, Canada, April 2018, pp. 3474-3478.
    DOI: https://doi.org/10.1109/ICASSP.2018.8461676

39. Novel Algorithms for Exact and Efficient L1-Norm-Based TUCKER2 Decomposition
    D. G. Chachlakis and P. P. Markopoulos
    in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Calgary, AB, Canada, April 2018, pp. 6294-6298.
    DOI: https://doi.org/10.1109/ICASSP.2018.8461834

40. Robust Decomposition of 3-Way Tensors Based on L1-Norm
    D. G. Chachlakis and P. P. Markopoulos
    in Proc. SPIE 10658, Compressive Sensing VII: From Diverse Modalities to Big Data Analytics, Orlando, FL, April 2018, p. 1065807.
    DOI: https://doi.org/10.1117/12.2307844

41. A Linear Discriminative Analysis Based Fall Motion Detector Using Radar
    S. Zlotnikov, P. Somaru, P. P. Markopoulos, and F. Ahmad
    in Proc. SPIE 10658, Compressive Sensing VII: From Diverse Modalities to Big Data Analytics, Orlando, FL, April 2018, p. 106580D.
    DOI: https://doi.org/10.1117/12.2311574

42. The Mean-Squared-Error of Autocorrelation Sampling in Coprime Arrays
    D. G. Chachlakis, P. P. Markopoulos, and F. Ahmad

in Proc. IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP), Curacao, Dutch Antilles, December 2017, pp. 1-5.
DOI: https://doi.org/10.1109/CAMSAP.2017.8313121

43. Indoor Human Motion Classification by L1-Norm Subspaces of Micro-Doppler Signatures
P. P. Markopoulos and F. Ahmad
in Proc. IEEE Radar Conference (RadarConf), Seattle, WA, USA, May 2017, pp. 1807-1810.
DOI: https://doi.org/10.1109/RADAR.2017.7944504

44. L1-Norm Principal-Component Analysis in L2-Norm-Reduced-Rank Data Subspaces
P. P. Markopoulos, D. A. Pados, G. N. Karystinos, and M. Langberg
in Proc. SPIE 10211, Compressive Sensing VI: From Diverse Modalities to Big Data Analytics, Anaheim, CA, April 2017, p. 1021104.
DOI: https://doi.org/10.1117/12.2263733

45. Visual Tracking with L1-Grassmann Manifold Modeling
D. G. Chachlakis, P. P. Markopoulos, R. J. Muchhala, and A. Savakis
in Proc. SPIE 10211, Compressive Sensing VI: From Diverse Modalities to Big Data Analytics, Anaheim, CA, April 2017, p. 1021102.
DOI: https://doi.org/10.1117/12.2263691

46. Adaptive Sparse-Binary Waveform Design for All-Spectrum Channelization
G. Sklivanitis, P. P. Markopoulos, S. Batalama, and D. A. Pados
in SPIE 10211, Compressive Sensing VI: From Diverse Modalities to Big Data Analytics, Anaheim, CA, April 2017, p. 102110B.
DOI: https://doi.org/10.1117/12.2262311
Student Travel Grant Award

47. Linear Discriminant Analysis with Few Training Data
P. P. Markopoulos
in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), New Orleans, LA, USA, March 2017, pp. 4626-4630.
DOI: https://doi.org/10.1109/ICASSP.2017.7953033

48. Sparse Waveform Design for All-Spectrum Channelization
G. Sklivanitis, P. P. Markopoulos, S. Batalama, and D. A. Pados
in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), New Orleans, LA, USA, March 2017, pp. 3764-3768.
DOI: https://doi.org/10.1109/ICASSP.2017.7952860

49. On the L1-norm Approximation of a Matrix by Another of Lower Rank
N. Tsagkarakis, P. P. Markopoulos, and D. A. Pados

in Proc. IEEE International Conference on Machine Learning and Applications (ICMLA), Anaheim, CA, USA, December 2016, pp. 768-773.
DOI: https://doi.org/10.1109/ICMLA.2016.0137

50. L1-Norm Principal-Component Analysis via Bit Flipping
P. P. Markopoulos, S. Kundu, S. Chamadia, and D. A. Pados
in Proc. IEEE International Conference on Machine Learning and Applications (ICMLA), Anaheim, CA, USA, December 2016, pp. 326-332.
DOI: https://doi.org/10.1109/ICMLA.2016.0060

51. Direction-of-Arrival Estimation from L1-Norm Principal Components
P. P. Markopoulos, N. Tsagkarakis, D. A. Pados, and G. N. Karystinos
in Proc. IEEE International Symposium on Phased Array Systems and Technology (PAST), Waltham, MA, USA, October 2016, pp. 1-6.
DOI: https://doi.org/10.1109/ARRAY.2016.7832585

52. Subpixel Target Detection in Hyperspectral Images with Local Matched Filtering in SLIC Superpixels
Y. Liang, P. P. Markopoulos, and E. Saber
in Proc. IEEE Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing (WHISPERS), Los Angeles, CA, USA, August 2016, pp. 1-5.
DOI: https://doi.org/10.1109/WHISPERS.2016.8071719

53. Reduced-Rank Filtering on L1-Norm Subspaces
P. P. Markopoulos
in Proc. IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM), Rio de Janeiro, Brazil, July 2016, pp. 1-5.
DOI: https://doi.org/10.1109/SAM.2016.7569743

54. Subpixel Target Detection in Hyperspectral Images from Superpixel Background Statistics
Y. Liang, P. P. Markopoulos, and E. Saber
in Proc. IEEE International Geoscience and Remote Sensing Symposium (IGARSS), Beijing, China, July 2016, pp. 7018-7021.
DOI: https://doi.org/10.1109/IGARSS.2016.7730830

55. L1-Fusion: Robust Linear-Time Image Recovery from Few Severely Corrupted Copies
P. P. Markopoulos, S. Kundu, and D. A. Pados
in Proc. IEEE International Conference on Image Processing (ICIP), Quebec City, QC, Canada, September 2015, pp. 1225-1229.
DOI: https://doi.org/10.1109/ICIP.2015.7350995

56. Direction Finding by Complex L1-Principal Component Analysis
N. Tsagkarakis, P. P. Markopoulos, and D. A. Pados

in Proc. IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Stockholm, Sweden, June 2015, pp. 475-479.
DOI: https://doi.org/10.1109/SPAWC.2015.7227083

57. Direction Finding with L1-Norm Subspaces
P. P. Markopoulos, N. Tsagkarakis, D. A. Pados, and G. N. Karystinos
in Proc. SPIE 9109, Compressive Sensing III, Baltimore, MD, May 2014, p. 91090J.
DOI: https://doi.org/10.1117/12.2053049
Student Travel Grant Award

58. Fast Computation of the L1-Principal Component of Real-Valued Data
S. Kundu, P. P. Markopoulos, and D. A. Pados
in Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Florence, Italy, May 2014, pp. 8028-8032.
DOI: https://doi.org/10.1109/ICASSP.2014.6855164

59. Some Options for L1-Subspace Signal Processing
P. P. Markopoulos, G. N. Karystinos, and D. A. Pados
in Proc. IEEE International Symposium on Wireless Communication Systems (ISWCS), Ilmenau, Germany, August 2013, pp. 622-626. Print ISBN:978-3-8007-3529-7 Received
Best Paper Award in Physical Layer Communications

60. Novel Full-Rate Noncoherent Alamouti Encoding that Allows Polynomial-Complexity Optimal Decoding
P. P. Markopoulos and G. N. Karystinos
in Proc. IEEE International Conference on Acoustics, Speech and Signal Processing, Vancouver, BC, Canada, May 2013, pp. 5075-5079.
DOI: https://doi.org/10.1109/ICASSP.2013.6638628

61. Short-Data-Record Filtering of PN-Masked Data
P. P. Markopoulos, S. Kundu, and D. A. Pados
in Proc. IEEE International Conference on Acoustics, Speech and Signal Processing, Vancouver, BC, Canada, May 2013, pp. 4559-4563.
DOI: https://doi.org/10.1109/ICASSP.2013.6638523

62. Towards Precision Agriculture: Building a Soil Wetness Multi-Hop WSN from First Principles
Bletsas, A. Vlachaki, E. Kampianakis, G. Sklivanitis, J. Kimionis, K. Tountas, M. Asteris, and P. P. Markopoulos
in Proc. International Workshop in Sensing Technologies in Architecture, Forestry and Environment (ECOSENSE) Belgrade, Serbia, April 2011, pp. 1-4.

Book Chapters

1. Dynamic and Robust Analysis of Tensor Data in the DDDAS Framework

D. G. Chachlakis, M. Dhanaraj, P. P. Markopoulos, and A. Prater-Bennette
In E. P. Blasch, F. Darema, S. Ravela, and A. J. Aved (Eds.), Handbook of Dynamic Data-Driven Application Systems (Vol. III). Springer, Cham, August 2025.
DOI: https://doi.org/10.1007/978-3-030-74568-4

2. L1-Norm Principal Component and Discriminant Analyses of Micro-Doppler Signatures for Indoor Human Activity Recognition
F. Ahmad and P. P. Markopoulos
In F. Fioranelli, M. Ritchie, A. Balleri, and H. Griffiths (Eds.), Micro-Doppler Radar and its Applications. IET Press, 2020.

3. Outlier-Resistant Data Processing with L1-norm Principal Component Analysis
P. P. Markopoulos, S. Kundu, S. Chamadia, N. Tsagkarakis, and D. A. Pados
In G. R. Naik (Ed.), Advances in Principal Component Analysis: Research and Development. Springer, 2018.

Theses & Doctoral Dissertation

1. Optimal Algorithms for L1-norm Principal Component Analysis: New Tools for Signal Processing and Machine Learning from Few and/or Faulty Training Data
P. P. Markopoulos
Ph.D. Dissertation, University at Buffalo, The State University of New York, June 2015

2. Full-Rate Differential M-PSK Alamouti Modulation with Polynomial-Complexity Maximum Likelihood Noncoherent Detection
P. P. Markopoulos
M.S. Thesis, Technical University of Crete, Greece, August 2012

3. Maximum-Likelihood Noncoherent M-PSK OSTBC Detection with Polynomial Complexity
P. P. Markopoulos
Engineering Diploma Thesis, Technical University of Crete, Greece, October 2010

Invited Talks and Tutorials

1. Tutorial: Federated Learning for Decentralized and Privacy-Preserving Machine Learning
SPIE DCS 2025, Machine Learning from Challenging Data Conference, April 2025.

2. Federated Learning in Healthcare: A Brief Review of Foundations, Applications, Challenges, and Opportunities
Brief tutorial at the NSF AI Spring School, The University of Texas at San Antonio, February 2025

3. Federated Learning-Introductory Tutorial

Tutorial at Dynamic Data Driven Applications Systems (DDDAS), November 2024

4. Advances in Robust and Efficient Machine Learning for National Security
   Invited talk at Department of Defense (16th Air Force / TD), August 2023

5. Tensor Methods for Efficient, Robust, and Continual Machine Learning
   Invited talk at UT San Antonio MATRIX Seminar Series, September 2022

6. Advances in Robust Machine Learning
   Invited talk at Intelligence Community Academic Research Symposium (ICARS), National Academies of Science, Engineering, and Medicine, September 2022

7. Advances in Robust Machine Learning
   Invited talk at Intelligence Community Academic Research Symposium (ICARS), National Academies of Science, Engineering, and Medicine, September 2021

8. L1-norm PCA: Algorithms and Applications
   Invited talk at Graduate Seminar, Rochester Institute of Technology, May 2021

9. Tensor Methods for Imaging Science
   Invited talk at Center for Imaging Science, Rochester Institute of Technology, November 2020

10. Tensor Methods Based on Absolute Projections
    Invited talk at Applied Mathematics Seminar, Department of Mathematics, Syracuse University, October 2020

11. Improving CNNs Towards Real-Time Multi-Modal Object Detection in Remote Sensing Imagery
    Invited talk at 6th Annual Intelligence Community Academic Research Symposium (ICARS), National Academies of Science, Engineering, and Medicine, September 2020

12. Tensor Methods for Signal Processing and Machine Learning
    Invited tutorial at Summer School on Data Science, Technical University of Crete, Chania, Greece, August 2020

13. Tensor Methods for Image Processing
    Invited talk at SIAM IS20, Tensor Methods for Image Processing Mini-Symposium, Toronto, Canada, July 2020

14. Improving CNNs Towards Real-Time Multi-Modal Object Detection in Remote Sensing Imagery
    Invited talk at National Geospatial-Intelligence Agency (NGA), July 2020

15. Tensor Methods for Robust Machine Learning

Invited talk at AFRL/RI, Rome, NY, April 2020

16. Robust Subspace Learning and Applications in Computer Vision
    Invited talk at ICCV Workshop on Robust Subspace Learning, Seoul, Korea, October 2019

17. L1-norm Principal Component Analysis of Multi-Modal Data
    Invited tutorial at Summer School, Technical University of Crete, Chania, Greece, July 2018

18. L1-norm PCA: Algorithms and Applications
    Invited talk at U.S. Air Force Research Lab (AFRL), Rome, NY, June 2018

19. Tensor Methods for Imaging and Sensing
    Invited talk at Institute for Sensing and Embedded Network Systems Engineering (I-SENSE), Florida Atlantic University, May 2018

20. Robust Subspace Processing
    Invited talk at MSEE Graduate Seminar, Rochester Institute of Technology, April 2018

21. L1-norm Methods for Signal Processing and Machine Learning
    Invited talk at Spring Move78/AI and Cognitive Technologies Speaker Series, Rochester Institute of Technology, January 2018

22. Robust Subspace Processing and Machine Learning
    Invited talk at University of Rochester (IEEE Rochester Section, AES/COMSOC Meeting), November 2016

23. L1-norm Tensor Methods Based on Absolute Projections
    Invited talk at Department of Electrical and Microelectronic Engineering, Rochester Institute of Technology, March 2015

24. Tensor Methods for Communications and Signal Processing
    Invited talk at Department of Electrical and Computer Engineering, Northeastern University, Boston, MA, October 2014

25. L1-norm Methods for Communications and Signal Processing
    Presenter at IEEE North American School of Information Theory, Toronto, Canada, June 2014

Pending Proposals (AY 2024-2025)

PRISM-AI: Platform for Research in the Socio-Exposome Utilizing Machine Learning in Autism
Funding agency: NIH
Total: $4,532,006

Own Effort: 33% (~$1.495M)
Role: Co-PI
Status: Pending

Funded Research Projects

Currently Funded Projects

AI/ML models designed to improve the quality of life for individuals with disabilities
Funding Agency: NIH / AIM-AHEAD (via The University of North Texas Health Science Center at Fort Worth)
Period: May 2024 - May 2026
Total amount: $99,999
Own Effort: $30 ($30,000)
Role: Co-PI

PARTNER: Neuro-Inspired AI for the Edge at UT San Antonio (NAIAD)
Funding agency: National Science Foundation (NSF)
Period: September 2023 to August 2027
Total amount: $2,800,000
Own Effort: 15% ($420,000)
Role: Co-PI

EXAIL: NSF ExpandAI Leadership Workshop
Funding agency: National Science Foundation (NSF)
Period: September 2024 to August 2025
Total amount: $126,871
Own Effort: 50% ($68,536)
Role: Co-PI

MATCH: The MATRIX AI/ML Concierge for Healthcare
Funding agency: NIH / AIM-AHEAD
Period: September 2024 to September 2025
Total amount: $500,000
Role: SP

Previously Funded Projects

Target Detection/Tracking and Activity Recognition from Multimodal Data
Funding agency: National Geospatial-Intelligence Agency (NGA)
Period: September 2019 to September 2024
Total amount: $858,534
Role: Co-PI (equal effort)

M-POWER: MATRIX-Provided AI/ML Open-Source Resource Center for Behavioral Health Empowerment
Funding agency: NIH / AIM-AHEAD Consortium
Period: September 2023 to August 2024
Total amount: $500,000
Role: SP

Theory and Efficient Algorithms for Dynamic and Robust L1-Norm Analysis of Tensor Data
Funding agency: U.S. Air Force Office of Scientific Research (AFOSR)
Period: January 2020 to January 2023 (extended to May 2024)
Total amount: $348,460
Role: Sole PI
Notes: Transferred to UT San Antonio for $195,401, November 2022 to May 2024; AFOSR Young Investigator Program (YIP)

Target Detection/Tracking and Activity Recognition from Multimodal Data
Funding agency: Rochester Institute of Technology (RIT) / Department of Defense
Period: June 2023 to May 2024
Total amount: $10,000
Role: Sole PI

Efficient Radar Imaging and Machine Learning for Concealed Object Detection
Funding agency: NYSTAR / University of Rochester Center for Data Science
Period: October 2021 to June 2022
Total amount: $58,079
Role: Sole PI

Continual and Incremental Learning with Tensor-Factorized Neural Networks
Funding agency: U.S. Air Force Research Laboratory (AFRL)
Period: September 2021 to December 2021
Total amount: $30,286
Role: Sole PI

Data-Driven Adaptive Learning for Video Analytics
Funding agency: U.S. Air Force Office of Scientific Research (AFOSR)
Period: February 2018 to February 2021
Total amount: $352,152
Role: Co-PI

Efficient Methods for Dynamic and Robust Analysis of Tensors
Funding agency: U.S. Air Force Research Laboratory (AFRL)
Period: November 2020 to December 2020
Total amount: $9,999
Role: Sole PI

Development and Testing of Robust Algorithms for Real-Time Recognition of Complex Gait Patterns from Wearable Sensor Data
Funding agency: Kate Gleason College of Engineering (KGCOE), RIT
Period: May 2018 to December 2019
Total amount: $21,000
Role: PI

Methods for Corruption-Resistant Analysis of Tensor Data
Funding agency: U.S. Air Force Research Laboratory, Information Directorate (AFRL/RI)
Period: September 2018 to October 2018
Total amount: $15,000
Role: Sole PI

Practical L1-Norm Principal Component Analysis: Tools for Reliable Data Analytics
Funding agency: Office of the Vice President for Research (OVPR), RIT
Period: April 2016 to March 2017
Total amount: $5,000
Role: Sole PI

Distributed Self-Localization of Wireless-Node Squads in Hostile Environments
Funding agency: Harris Corporation (now L3Harris)
Period: November 2016 to June 2017
Total amount: $60,000
Role: PI

Research Highlights and Recognitions

- Awardee, Cloud Technology Endowed Fellowship, The University of Texas at San Antonio, September 2025.
- Nominee / selected, Faculty Research Immersive Program between UTSA and Tec de Monterrey, June 2025.
- Nominee / not selected, University Excellence Award (Innovation and Impact, I-Squared), The University of Texas at San Antonio, May 2025.
- Awardee, Margie and Bill Klesse Endowed Professorship, Klesse College of Engineering and Integrated Design, The University of Texas at San Antonio, August 2022 to September 2025 (three consecutive years).
- Ph.D. advisee Dimitris G. Chachlakis: Best Doctoral Dissertation Award (university-wide), Rochester Institute of Technology, April 2023.
- Ph.D. advisee Dimitris G. Chachlakis: First graduate of the RIT Ph.D. program in Electrical and Computer Engineering, 2022.
- UT STARs Program Award, University of Texas System, 2022.
- AFOSR Young Investigator Program (YIP) Award, U.S. Air Force Office of Scientific Research, 2019.
- Exemplary Performance in Research, Kate Gleason College of Engineering, Rochester Institute of Technology, 2019 (for proposals submitted in 2018).

- Exemplary Performance in Research, Kate Gleason College of Engineering, Rochester Institute of Technology, 2018 (for proposals submitted in 2017).
- Runner-up Poster Award for "Gait recognition based on tensor analysis of acceleration data from wearable sensors," IEEE Western New York Image and Signal Processing Workshop, 2018.
- Student Travel Grant Award for "Adaptive sparse-binary waveform design for all-spectrum channelization," SPIE Defense and Commercial Sensing, 2017.
- Student Travel Grant Award for "Direction finding with L1-norm subspaces," SPIE Defense, Security, and Sensing, 2014.
- Best Paper Award in Physical Layer Communications and Signal Processing for "Some options for L1-subspace signal processing," International Symposium on Wireless Communication Systems (ISWCS), 2013.

Student Research Advising

Current Doctoral Advisees

R. U. Haque
Ph.D., Electrical Engineering, The University of Texas at San Antonio (UT San Antonio)
Research: Federated learning
8/2023 - Present

V. T. Nguyen
Ph.D., Electrical Engineering, The University of Texas at San Antonio (UT San Antonio)
Research: Quantum machine learning
8/2023 - Present

I. Tomeo
Ph.D., Engineering, Rochester Institute of Technology (RIT)
Research: Tensor methods for machine learning
Co-advised with Prof. Andreas Savakis (RIT)
8/2020 - Present

Doctoral Graduates

M. Sharma
Ph.D., Imaging Science, Rochester Institute of Technology (RIT), 2024
Research: Incremental and continual learning with deep neural networks
Co-advised with Prof. Eli Saber (RIT)

M. Dhanaraj
Ph.D., Engineering, Rochester Institute of Technology (RIT), 2018 to 2022
Research: Stochastic subspace optimization and tensors for deep learning

D. Chachlakis

Ph.D., Electrical and Computer Engineering, Rochester Institute of Technology (RIT), 2021
Dissertation: "Theory and algorithms for reliable multi-modal data analysis, machine learning, and signal processing"
Current position: Senior R&D Engineer, Digimarc Corporation
Note: First graduate of RIT's Ph.D. in ECE program

Y. Liang
Ph.D., Imaging Science, Rochester Institute of Technology (RIT), 2019
Dissertation: "Object Detection in High Resolution Aerial Images and Hyperspectral Remote Sensing Images"
Co-advised with Prof. Eli Saber (RIT)
Current position: Computer Vision Software Engineer, Apple

Shorter Doctoral Collaborations

S. Bandela
Ph.D. Electrical Engineering, UT San Antonio
8/2023 - 11/2024

E. M. Pordel
Ph.D. Electrical Engineering, UT San Antonio
1/2024 - 7/2024

M. Mozaffari
Ph.D. Electrical and Computer Engineering, RIT
8/2020 - 8/2022

BS/MS Graduates

I. Omer
M.S., Electrical Engineering, UT San Antonio, 2023
Role: Graduate Research Assistant (GRA)

B. Young
B.S. EE, UT San Antonio, 2023
Program: Klesse ML Scholarship Research

R. Adhikari
B.S., CS, UT San Antonio, 2023
Program: Klesse ML Scholarship Research

A. Gomez
B.S., EE, UT San Antonio, 2023
Program: Klesse ML Scholarship Research

K. Shivani
B.S., Electrical Engineering (Honors), RIT
Research: Combinatorics and clustering

M. Krol
B.S./M.S., Electrical Engineering, RIT, 2022
M.S. Thesis: “Lp-norm subspace signal processing and continual learning with deep neural networks”

D. Le
B.S./M.S., Electrical Engineering, RIT, 2022
M.S. Thesis: “Lp-norm subspace signal processing and robust singular value estimation”

T. Sarkar
M.S., Electrical Engineering, RIT, 2020
Graduate paper: “An overview of tensor methods for data fusion”
Current position: Ph.D. student, RIT Center for Imaging Science

A. Quirk
M.S., Electrical Engineering, RIT, 2019
Graduate paper: “Joint frame synchronization and channel estimation with sparse signal recovery using Simulink”
Current position: Electrical Design Engineer, L3Harris

I. Tomeo
M.S., Electrical Engineering, RIT, 2019
Thesis: “Covariance estimation from limited data: State-of-the-art, algorithm implementation, and application to wireless communications”
Current position: Ph.D. student at RIT; Electrical Engineer, L3Harris

A. Ganapathi
M.S., Electrical Engineering, RIT, 2019
Graduate paper: “Methods for topology estimation and localization based on RF signaling”
Current position: Hardware Engineer, IBM

K. Bichave
M.S., Electrical Engineering, RIT, 2019
Graduate paper: “CNN pruning using tensor decomposition”
Current position: Deep Reinforcement Learning Engineer, iRobot

C. Agbalessi
B.S., Electrical Engineering (Honors), RIT, 2019
Research: Machine learning for motion recognition from radar measurements

O. Brewer

B.S., Electrical Engineering (Honors), RIT, 2018
Research: Machine learning for gait recognition with IMUs

R. French
M.S., Electrical Engineering, RIT, 2018
Graduate paper: “Studying spread-spectrum multiplexing with software-defined radios”
Current position: Systems Engineer, L3Harris

M. Dhanaraj
M.S., Electrical Engineering, RIT, 2018
Thesis: “Incremental and adaptive L1-norm principal component analysis: Novel algorithms and applications in signal processing and computer vision”
Current position: Ph.D. student, MILOS Lab

C. Modak
M.S., Electrical Engineering, RIT, 2018
Graduate paper: “Review and implementation of methods for spectrum sensing”
Current position: Network Engineer, FedEx Services

A. Adhikari
M.S., Electrical Engineering, RIT, 2018
Graduate paper: “Software-defined-radio implementation of spread-spectrum user multiplexing”

E. Ljuca
B.S., Electrical Engineering, RIT, 2017
Research: K-means clustering
Current position: Software Engineer II, BAE Systems

D. Bowers
B.S./M.S., Electrical Engineering, RIT, 2017
Graduate paper: “Distributed localization of RF-nodes with orchestrated signaling”

A. Desai
M.S., Electrical Engineering, RIT, 2016
Graduate paper: “A guide to software defined radio: State-of-the-art platforms, important applications, and testbed development”
Current position: System Design Engineer, AMD

P. Kothawade
M.S., Electrical Engineering, RIT, 2016
Graduate paper: “A survey of methods and algorithms for L1-norm principal component analysis”
Current position: Wireless Engineer, MetTel

S. Koliparthi
M.S., Electrical Engineering, RIT, 2016
Graduate paper: Online PCA (review)

K. M. Thu
M.S., Electrical Engineering, RIT, 2016
Graduate paper: Short-data beamforming
Current position: Digital Verification Engineer, Allegro MicroSystems

Thesis and Dissertation Committees

Current Doctoral Committees

Vendant Karia
Ph.D., Electrical and Computer Engineering, The University of Texas at San Antonio (UT San Antonio), 2025 to Present.
Advisor: Dr. D. Kudithipudi. Topic: Neuromorphic architectures for continual learning on silicon.

Fatima Tuz Zohora
Ph.D., Electrical and Computer Engineering, UT San Antonio, 2024 to Present.
Advisor: Dr. D. Kudithipudi. Topic: Brain-inspired continual learning with memristors.

Paula Jaimes Buttron
Ph.D., Electrical and Computer Engineering, UT San Antonio, 2025 to Present.
Advisor: Dr. C. Vivas-Valencia.

Israt Ara
Ph.D., Electrical and Computer Engineering, UT San Antonio, 2024 to Present.
Advisor: Dr. B. Kelley.

Adam Hooker
Ph.D., Computer Science, UT San Antonio, 2025 to Present.
Advisor: Dr. R. Choo. Topic: Understanding and defending against user-generated adversarial content in emerging social media platforms.

Jose Gonzalez
Ph.D., Computer Science, UT San Antonio, 2025 to Present.
Advisor: Dr. R. L. Hood.

M. Demoor
Ph.D., Electrical Engineering, UT San Antonio, 2023 to 2024.
Advisor: Dr. J. Prevost. Dissertation: “Realigned Softmax Warping for Compact and Separable Embedding Formation.”

Sauarv Singh
Ph.D., Engineering, Rochester Institute of Technology (RIT), 2023 to 2025.
Advisor: Dr. J. Heard. Topic: Human-aware reinforcement learning for adaptive human-robot teaming.

T. Pandit
Ph.D., Electrical Engineering, UT San Antonio, 2022 to 2025.
Advisor: Dr. D. Kudithipudi. Topic: Scalable continual learning using cascading hypernetworks and cellular automata.

K. Peng
Ph.D., Computer Science, UT San Antonio, 2023.
Advisor: Dr. Kevin Desai. Dissertation: "Enhancing Depth Estimation in Adverse Lighting Scenarios for Autonomous Driving."

S. Dongre
Ph.D., Electrical and Computer Engineering, RIT, 2023.
Advisor: Dr. Hanif Rahbari. Dissertation: "Fair and Secure Coexistence of 5G NR-U with Wi-Fi and RAS using Robust Implicit Channel Coordination."

O. A. Latif
Ph.D., Electrical and Computer Engineering, RIT, 2023.
Advisor: Dr. A. Kwasinski. Dissertation: "End-to-End Network Slicing Using Hypergraph Theory."

N. Soures
Ph.D., Engineering, RIT, 2019 to 2023.
Advisor: Dr. D. Kudithipudi.

Master's Thesis and Project Committees

Z. Carmichael
M.S., Computer Engineering, RIT, 2019.
Advisor: Dr. D. Kudithipudi.

L. Pham
M.S., Computer Engineering, RIT, 2019.
Advisor: Dr. A. Kwasinski.

S. A. Mamun
Ph.D., Engineering, Kate Gleason College of Engineering (KGCOE), RIT, 2021.
Advisor: Dr. A. Ganguly.

M. Meraj Ahmed
Ph.D., Engineering, KGCOE, RIT, 2021.

Advisor: Dr. A. Ganguly.

S. M. Shahriat
M.S., Computer Engineering, RIT, 2019.
Advisor: Dr. A. Ganguly.

I. Ramsey
M.S., Computer Engineering, RIT, 2018.
Advisor: Dr. A. Kwasinski.

B. Minehan
Ph.D., Engineering, KGCOE, RIT, 2018 to 2020.
Advisor: Dr. A. Savakis.

F. Shah Mohammadi
Ph.D., Engineering, KGCOE, RIT, 2018 to Present.
Advisor: Dr. A. Kwasinski.

S. M. Alzahrani
M.S., Electrical Engineering, RIT, 2018.
Advisor: Dr. J. C. Cockburn.

S. S. Chitnavis
M.S., Computer Engineering, RIT, 2018.
Advisor: Dr. A. Kwasinski.

M. Iyer
M.S., Electrical Engineering, RIT, 2018.
Advisor: Dr. J. Venkataraman.

A. Vashist
M.S., Electrical Engineering, RIT, 2017.
Advisor: Dr. A. Ganguly.

R. Singh Nardes
M.S., Electrical Engineering, RIT, 2017.
Advisor: Dr. J. Venkataraman.

I. Frasch
M.S., Computer Engineering, RIT, 2017.
Advisor: Dr. A. Kwasinski.

V. Ramji
M.S., Electrical Engineering, RIT, 2016.
Advisor: Dr. B. Ghoraani.

D. Chachlakis
Engineering Diploma (B.S./M.S.), Electrical and Computer Engineering, Technical University of Crete, 2016.
Advisor: Dr. G. Karystinos.

J. Hernandez Guzman
M.S., Electrical Engineering, RIT, 2016.
Advisor: Dr. G. Tsouri.

S. Kumar
M.S., Electrical Engineering, RIT, 2016.
Advisor: Dr. A. Savakis.

Teaching

Courses Taught / Developed at UT San Antonio (2022 to Present)

Intro to Machine Learning (EE-4463-901, EE-5573-901, CS-6243-901)
Spring 2025; Enrollment: 43; Overall course 4.65/5; Overall teaching 4.62/5.

Intro to Machine Learning (EE-4463-901, EE-5573-901)
Fall 2024; Enrollment: 29; Overall course 4.36/5; Overall teaching 4.48/5.

Research Seminar (EE-6991-901, EE-7931-902)
Spring 2024; Enrollment: 12; Overall course 3.60/5; Overall teaching 3.80/5.

Advanced Machine Learning (CS-6243-901, EE-6363-901)
Fall 2023; Enrollment: 22; Overall course 4.67/5; Overall teaching 4.67/5.

Probability and Stochastic Processes (EE-3533-001)
Spring 2023; Enrollment: 22; Overall course 4.50/5; Overall teaching 4.55/5.

Machine Learning (EE-5263)
Fall 2022; Enrollment: 8; Evaluations: N/A.

Courses Taught / Developed at RIT (2015 to 2022)

Artificial Intelligence Explorations (EEEE-547/647)
Fall 2021; Enrollment: 30.

Introduction to Communication Systems (EEEE-484)
Fall 2019; Spring 2020; Fall 2020; Spring 2021; Enrollment: ~60 per term.

Digital Data Communications (EEEE-593/693)

Fall 2015; Fall 2016; Spring 2018; Spring 2019; Enrollment: ~25 per term.

Communication Networks (EEEE-592/692)
Spring 2016; Spring 2017; Fall 2017; Fall 2018; Enrollment: ~30 per term.

Sensor Array Processing for Wireless Communications (EEEE-594/694)
Spring 2018; Spring 2019; Spring 2020; Enrollment: ~15 per term; Newly designed course.

Optimization Methods for Engineers (EEEE-595/695)
Newly designed course; Not taught.

Cooperative Education (EEEE-499)
Summer 2017 to Summer 2022; Enrollment: ~15 per term.

Freshman Practicum (EEEE-105)
Fall 2017; Enrollment: ~15.

Teaching Experience as a Graduate Student (before 2015)

Smart Antennas (EE-614), University at Buffalo
Spring 2014; Lectures delivered.

Communication Systems II (EE-484), University at Buffalo
Fall 2013; Lectures delivered.

Professional Service

National Science Foundation (NSF)

- Co-Organizer and Host, NSF AI Spring School (sponsored by UT San Antonio and NSF), San Antonio, TX, February 2025.
- Co-Organizer, NSF ExpandAI Leadership Workshop (EXAIL), Pittsburgh, PA, October 2024. Venue for leaders from ExpandAI and AI Institutes.
- Co-Organizer, NSF AI Spring School (sponsored by UT San Antonio and NSF), San Antonio, TX, March 2024.
- Proposal Evaluation Panelist, Directorate for Computer & Information Science & Engineering, 2021.
- Proposal Evaluation Panelist, Graduate Research Fellowship Program, 2019.
- Proposal Evaluation Panelist, Graduate Research Fellowship Program, 2018.
- Proposal Evaluation Panelist, Directorate for Computer & Information Science & Engineering, 2016.

Department of Defense

Academic Research Proposal Reviewer, Army Research Office (ARO), 2021.

The University of Texas at San Antonio (UT San Antonio)

University Level

- Co-Author, UT San Antonio response to the Request for Information on the Development of a 2025 National Artificial Intelligence R&D Strategic Plan, May 2025.
- Member and NSF Proposal Co-Author, QuICR Initiative (Quantum Information & Computing Research); thrust lead for quantum algorithms, computing, and machine learning, February 2025 to Present.
- Lead, Trustworthy AI Thrust, MATRIX: The UT San Antonio AI Consortium for Human Well-Being, 2024 to Present.
- Member, Second Dean Search Committee, College of AI, Cyber, and Computing, August 2025 to Present.
- Lead, Cluster and Connected Hire Proposal, "Machine Learning Hardware and Systems," Office of Academic Affairs, May 2025.
- Attendee and Presenter, "AI Opportunity Alignment Workshop with Research and MATRIX AI," Office of Research, April 2025.
- Member, First Dean Search Committee, College of AI, Cyber, and Computing, January 2025 to May 2025 (resulted in interim appointment).
- Member, Regents Professorships (AI Cluster Hiring) Committee, September 2024 to March 2025.
- Attendee and Honoree, Endowed Chairs, Professors, and Fellows Celebration, September 2024.
- Member, Task Force for the Design of the New College of AI, Computing, and Cybersecurity, 2023 to May 2024 (approximately 35 UT San Antonio faculty and leaders).
- Member (representing UT San Antonio), Quantum Computing Steering Committee, ASU Quantum Collaborative, September 2023 to Present.
- Presenter, UT San Antonio Day at the Capitol (representing UT San Antonio SDS and MATRIX AI Consortium), February 2023.
- Attendee, UIDP 2022 (representing UT San Antonio SDS).
- Attendee, UT San Antonio Commencement, May 2023.
- Host, MATRIX AI Seminar Series (Dr. Nancy Chen and Dr. Furong Huang).

College Level

- Attendee, Department of Defense Panel, organized by KCEID, June 2025.
- Attendee, Klesse Scholars Luncheon, October 2024.
- Reviewer, Undergraduate Curriculum Proposals – Incentive Opportunity, KCEID, Summer 2023.

Department Level (ECE)

- Member, Task Force for Determining Departmental Annual Evaluation Policy, 2023 to 2025.
- Chair, Signal Processing and Learning Concentration (Accreditation tasks, catalog revisions, course scheduling, and renaming from Digital Signal Processing), 2023 to 2025.
- Member, Faculty Review Advisory Committee (1 promotion and tenure case; 3 third-year review cases), 2023 to 2025.
- Member, Hiring Committee (AI accelerator and Bioinformatics; resulted in 2 hires), 2022 to 2025.
- Author, Space Proposal for MSSP Lab at San Pedro II (approved), 2023.
- Representative, UT San Antonio Day, April 2023.

Rochester Institute of Technology (RIT)

Department Level

- Chair, Branding Committee, Department of Electrical and Microelectronic Engineering, 2021 to 2022.

College Level

- Member, Ph.D. Qualification Exam Committee, KGCOE, 2017 to 2022.

University Level

- Academic Senator, RIT Faculty Senate, 2021 to 2022.
- Panelist, Intellectual Property & Technology Transfer Office, Spring 2017.
- Core Faculty, Center for Human-Aware AI (co-organization and chairing of seminars), November 2019 to 2022.
- Session Chair, Graduate Research Symposium, 2016.

Professional Societies

Global Leadership

- Member, IEEE Signal Processing Society Education Board, 2023 to Present.
- Chair, Content Production Committee, IEEE Signal Processing Society, 2023 to 2024. Established processes for content procurement, contracted vendors, and reviewed pilot content.

Editorships

- Associate Editor, IEEE Transactions on Artificial Intelligence, 2022 to Present. Assigned reviewers and evaluated recommendations for submitted manuscripts.
- Associate Editor, IEEE Inside Signal Processing (e-newsletter), 2022 to Present. Authored multiple interview-articles.
- Editor, IEEE Wireless Communication Letters, 2017 to 2019.

Conference Organization

- Organizer, Machine Learning from Challenging Data 2026, SPIE Defense and Commercial Sensing (SPIE DCS), Orlando, FL, April 2026.
- Organizer, Machine Learning from Challenging Data 2025, SPIE Defense and Commercial Sensing (SPIE DCS), Orlando, FL, April 2025.
- Organizer, Big Data: Learning, Analytics, and Applications VI, SPIE DCS, National Harbor, MD, April 2024.
- Co-Organizer, Big Data: Learning, Analytics, and Applications V, SPIE DCS, Orlando, FL, April 2023.
- Co-Organizer, Robust Subspace Learning in Computer Vision (RSL-CV) Workshop, ICCV 2021, remote, October 2021.
- Co-Organizer, Big Data IV: Learning, Analytics, and Applications, SPIE DCS, Orlando, FL, April 2022.
- Co-Organizer, Big Data III: Learning, Analytics, and Applications, SPIE DCS, Orlando, FL, April 2021.
- Co-Organizer, Special Session on Tensor Methods for Signal, Data, and Network Analytics, IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, November 2020.
- Organizing Committee, Big Data II: Learning, Analytics, and Applications, SPIE DCS, Anaheim, CA, April 2020.
- Co-Organizer and Technical Program Chair, IEEE International Workshop on Machine Learning for Signal Processing (IEEE MLSP), Pittsburgh, PA, October 2019.
- Co-Organizer, TensorSymp 2: Tensor Methods for Signal Processing and Machine Learning, IEEE GlobalSIP, Ottawa, Canada, October 2019.
- Co-Organizer, Big Data: Learning, Analytics, and Applications, SPIE DCS, Baltimore, MD, April 2019.
- Co-Organizer, 3rd IEEE International Workshop on Wireless Communications and Networking in Extreme Environments (WCNEE), IEEE INFOCOM 2019, Paris, France, May 2019.
- Co-Organizer, Special Session on Signal Processing for Smart City Applications and IoT, IEEE ICASSP, Brighton, UK, May 2019.
- Co-Organizer, TensorSymp: Tensor Methods for Signal Processing and Machine Learning, IEEE GlobalSIP, Anaheim, CA, November 2018.
- Co-Organizer, Special Session on Signal Processing and Communications for Resilient Autonomous Systems, IEEE SAM, Sheffield, UK, July 2018.
- Co-Organizer, Special Session on L1-norm Array Data Processing, IEEE Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, October 2018.

- Co-Organizer, Data Analysis and Learning with Faulty Measurements, Compressive Sensing VII, SPIE DCS, Orlando, FL, April 2018.
- Co-Organizer, 2nd IEEE WCNEE, IEEE INFOCOM 2018, Honolulu, HI, April 2018.
- Co-Organizer, Advances in Processing Faulty High-Dimensional Data, IEEE CAMSAP, Curacao, Dutch Antilles, December 2017.
- Co-Organizer, 1st IEEE WCNEE, IEEE INFOCOM 2017, Atlanta, GA, May 2017.
- Co-Organizer, Data/Signal Processing with Faulty Measurements, Compressive Sensing VI, SPIE DCS, Anaheim, CA, April 2017.

Other Selected Conference Technical Program Committees

- Member, Technical Program Committee, IEEE SwarmNet, 2023.
- Member, Technical Program Committee, IEEE SwarmNet 2020, IEEE WOWMOM 2020, virtual, August 2020.
- Member, Technical Program Committee, IEEE SwarmNet 2019, IEEE WOWMOM 2019, Washington, DC, June 2019.
- Member, Technical Program Committee, IEEE MLSP 2018, Aalborg, Denmark, September 2018.
- Member, Technical Program Committee, EUSIPCO 2018, Rome, Italy, September 2018.
- Member, Technical Program Committee, IEEE MLSP 2017, Tokyo, Japan, September 2017.
- Member, Technical Program Committee, EUSIPCO 2017, Kos, Greece, September 2017.

Journal Reviews

- IEEE Transactions on Signal Processing
- IEEE Journal on Selected Topics in Signal Processing
- IEEE Signal Processing Letters
- IEEE Transactions on Image Processing
- IEEE Access
- EURASIP Journal on Advances in Signal Processing
- IEEE Transactions on Communications
- IEEE Transactions on Multimedia
- IEEE Transactions on Wireless Communications
- IEEE Wireless Communications Letters (Exemplary Reviewer Award)
- IEEE Geoscience and Remote Sensing Letters
- INFORMS Journal on Computing
- Journal of the Franklin Institute
- Additional reviews for IEEE, SPIE, and EURASIP conferences.

K-12 Outreach and Mentoring

- Mentor, high school student research experience (provided research topic to S. Amarahdi, son of UT San Antonio colleague Dr. Radhika Amarahdi).

- Participant, Beyond 9.8 Initiative, RIT, 2017. Delivered K-12 outreach workshops offering mini-courses on engineering to 5th–6th graders.
- Collaborator, RIT Center "Engineers of Color Creating Opportunities (ECCO)," 2017 to Present. Outreach at local schools, including Nathaniel Rochester Community School Career Fair (2018, 2019).
- Chair, Organizing Committee, E3 Engineering and Technology Fair, RIT, 2019. Member of the organizing committee since 2018. Annual K-12 outreach fair with student competitions, awards, and engineering demos.
- Co-Organizer, Invited Talks for Young Faculty Career Development, November 2016. Sponsored by Faculty Mentoring Grant ($1,950 non-research award), Office of the Provost, Faculty Career Development, RIT. Collaborators: P. Mohseni, L. Herrera, I. Puchades, J. Zhang, E. Hensel, S. Hubbard, B. Landi.

Service Highlights and Recognition

- Appointed Member, IEEE Signal Processing Society Board of Education, 2023.
- Elevated to IEEE Senior Member, 2022.
- Exemplary Reviewer, IEEE Communications Society, 2017. Recognized for contributions to IEEE Wireless Communications Letters (2016).

Professional Memberships

- Senior Member, Institute of Electrical and Electronics Engineers (IEEE).
- Member, IEEE Signal Processing Society.
- Member, IEEE Communications Society.
- Member, IEEE Computer Society.
- Member, Technical Committee for Pattern Analysis and Machine Intelligence (IEEE Computer Society).
- Member, Technical Committee on Data Engineering (IEEE Computer Society).
- Affiliate Member, Technical Committee on Sensor Array and Multichannel and Technical Committee on Machine Learning for Signal Processing (IEEE Signal Processing Society).
- Member, Society for Industrial and Applied Mathematics (SIAM).
- Member, International Society for Optics and Photonics (SPIE).
- Member, American Society for Engineering Education (ASEE).

Languages

- Greek - Native (C2).
- English - Proficient (C2).
- German - Intermediate (B2; Mittelstufe certificate, Goethe Institute).