Shahana Ibrahim

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RESEARCH INTERESTS

Machine learning, signal processing, optimization, graph learning, compressive sensing, factorization models: theory and applications in deep learning, trustworthy learning

EDUCATION

Oregon State University — Corvallis, USA
Ph.D. in Electrical and Computer Engineering — *09 Sep 2018 - 08 Sep 2023*
Thesis: *Learning from Crowdsourced Noisy Annotations: From Dawid-Skene to Deep Neural Networks*
Advisor: Dr. Xiao Fu

Oregon State University — Corvallis, USA
Masters in Electrical and Computer Engineering — *09 Sep 2018 - 13 Dec 2019*
Thesis: *Crowdsourcing via Pairwise Co-occurrences: Identifiability and Algorithms*

National Institute of Technology, Calicut — Kerala, India
Bachelors in Electronics and Communication Engineering — *23 Jul 2008 - 01 May 2012*

ACADEMIC & PROFESSIONAL EXPERIENCE

University of Central Florida — Orlando, USA
Assistant Professor — *21 Dec 2023 - Present*

Oregon State University — Corvallis, USA
Research Associate — *08 Sep 2023 - 20 Dec 2023*

Oregon State University — Corvallis, USA
Graduate Research Assistant — *09 Sep 2018 - 27 Aug 2023*

NVIDIA — Santa Clara, USA
GPU Validation Intern — *14 May 2018 - 17 Aug 2018*

Texas A&M University — College Station, USA
Graduate Research Assistant — *11 Sep 2017 - 13 May 2018*

Texas Instruments — Bangalore, India
System Validation Engineer — *02 Jul 2012 - 10 Jun 2017*

REFEREED CONFERENCE PAPERS

* Equal contribution , † UCF Student

[C1] Faizul Rakib Sayem† and **Shahana Ibrahim**, *"Robust Multi-Label Learning with Human-Guided and Foundation Model-Aided Crowd Framework"*, IEEE International Conference on Image Processing (ICIP), 2025

[C2] Diego Linares Gonzalez† and **Shahana Ibrahim**, *"Multi-label Recognition under Noisy Supervision: A Confusion Mixture Modeling Approach"*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2025

[C3] Tri Nguyen, **Shahana Ibrahim**, and Xiao Fu, *"Under-Counted Matrix Completion Without Detection Features"*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2025

[C4] Tri Nguyen*, **Shahana Ibrahim***, and Xiao Fu, *"Noisy Label Learning with Instance-Dependent Outliers: Identifiability via Crowd Wisdom"*, Advances in Neural Information Processing Systems, 2024, https://openreview.net/forum?id=HTLJptF7qM

[C5] Diego Linares Gonzalez† and **Shahana Ibrahim**, *"Deep Learning under Instance-dependent Label Noise: A Tensor Factorization Perspective"*, Asilomar Conference on Signals, Systems, and Computers, 2024

[C6] **Shahana Ibrahim**, Xiao Fu, Rebecca Hutchinson, and Eugen Seo *"Under-Counted Tensor Completion with Neural Incorporation of Attributes"*, International Conference on Machine Learning, 2023, https://proceedings.mlr.press/v202/ibrahim23a.html

[C7] Tri Nguyen, **Shahana Ibrahim**, and Xiao Fu, *"Deep Clustering with Incomplete Noisy Pairwise Annotations: A Geometric Regularization Approach"*, International Conference on Machine Learning, 2023, https://proceedings.mlr.press/v202/nguyen23d

[C8] Tim Marrinan, **Shahana Ibrahim**, and Xiao Fu, *"Labeling Sequential Data from Noisy Annotations"*, IEEE Sensor Array and Multichannel Signal Processing Workshop, 2023, https://ieeexplore.ieee.org/abstract/document/10636383

[C9] Daniel Grey Wolnick, **Shahana Ibrahim**, Tim Marrinan, and Xiao Fu, *"Deep Learning from Noisy Labels via Robust Nonnegative Matrix Factorization-Based Design"*, IEEE Computational Advances in Multi-Sensor Adaptive Processing Workshop, 2023, https://ieeexplore.ieee.org/document/10403492

[C10] **Shahana Ibrahim**, Tri Nguyen, and Xiao Fu, *"Deep Learning From Crowdsourced Labels: Coupled Cross-entropy Minimization, Identifiability, and Regularization"*, International Conference on Learning Representations, 2023, https://openreview.net/forum?id=_qVhsWyWB9

[C11] **Shahana Ibrahim**, Xiao Fu, Rebecca Hutchinson, and Eugen Seo, *"Under-Counted Tensor Completion with Neural Network-based Side Information Learner"*, NeurIPS Women in Machine Learning Workshop, 2022, https://openreview.net/forum?id=5qmc0PoktR

[C12] **Shahana Ibrahim** and Xiao Fu, *"Crowdsourcing via Annotator Co-occurrence Imputation and Provable Symmetric Nonnegative Matrix Factorization"*, International Conference on Machine Learning, 2021, https://proceedings.mlr.press/v139/ibrahim21a.html

[C13] Wenqiang Pu, **Shahana Ibrahim**, Xiao Fu, and Mingyi Hong, *"Fiber-Sampled Stochastic Mirror Descent For Tensor Decomposition with β-Divergence"*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2021, https://ieeexplore.ieee.org/document/9413830

[C14] **Shahana Ibrahim** and Xiao Fu, *"Learning Mixed Membership from Adjacency Graph via Systematic Edge Query: Identifiability and Algorithm"*, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2021, https://ieeexplore.ieee.org/document/9413541

[C15] Lingyi Huang, Chunhua Deng, **Shahana Ibrahim**, Xiao Fu, Bo Yuan, *"VLSI Hardware Architecture of Stochastic Low-rank Tensor Decomposition"*, Asilomar Conference on Signals, Systems, and Computers, 2021, https://ieeexplore.ieee.org/document/9723182

[C16] **Shahana Ibrahim** and Xiao Fu, *"Recovering Joint PMF from Pairwise Marginals"*, Asilomar Conference on Signals, Systems, and Computers, 2020, https://ieeexplore.ieee.org/document/9443425

[C17] **Shahana Ibrahim**, Xiao Fu, Nikos Kargas, and Kejun Huang "*Crowdsourcing via Pairwise Co-occurrences: Identifiability and Algorithms*", Advances in Neural Information Processing Systems, 2019, https://proceedings.mlr.press/v139/ibrahim21a/ibrahim21a.pdf

[C18] **Shahana Ibrahim** and Xiao Fu, *"Stochastic Optimization for Coupled Tensor Decomposition with Applications in Statistical Learning"*, IEEE Data Science Workshop (DSW), 2019, https://ieeexplore.ieee.org/document/8755797

JOURNAL ARTICLES

[J1] **Shahana Ibrahim**, Panagiotis A Traganitis, Xiao Fu, Georgios B Giannakis, *"Learning From Crowdsourced Noisy Labels: A Signal Processing Perspective"*, IEEE Signal Processing Magazine, 2025

[J2] Wenqiang Pu, **Shahana Ibrahim**, Xiao Fu, and Mingyi Hong, *"Stochastic Mirror Descent for Low-Rank Tensor Decomposition Under Non-Euclidean Losses"*, IEEE Transactions on Signal Processing, 2022, doi:10.1109/TSP.2022.3163896

[J3] **Shahana Ibrahim** and Xiao Fu, *"Recovering Joint Probability of Discrete Random Variables from Pairwise Marginals"*, IEEE Transactions on Signal Processing, 2021, doi: 10.1109/TSP.2021.3090960

[J4] **Shahana Ibrahim** and Xiao Fu, *"Mixed Membership Graph Clustering via Systematic Edge Query"*, IEEE Transactions on Signal Processing, 2021, doi: 10.1109/TSP.2021.3109380

[J5] **Shahana Ibrahim**, Xiao Fu, and Xingguo Li, *"On Recoverability of Randomly Compressed Tensors with Low CP Rank"*, IEEE Signal Processing Letters, 2020, doi:10.1109/LSP.2020.3003252

[J6] Xiao Fu, **Shahana Ibrahim**, Hoi-To Wai, Cheng Gao, and Kejun Huang, *"Block-Randomized Stochastic Proximal Gradient for Low Rank Tensor Factorization"*, IEEE Transactions on Signal Processing, 2020, doi: 10.1109/TSP.2020.2982321

[J7] **Shahana Ibrahim**, Dileep Kalathil, Rene Sanchez, and Pravin Varaiya, "*Estimating Phase Duration for SPAT messages*", IEEE Transactions on Intelligent Transportation Systems, 2019, doi: 10.1109/TITS.2018.2873150

ACTIVE GRANTS

[G1] Aniket Bhattacharya, **Shahana Ibrahim (co-PI)**, and George Atia, AI-BTO **DARPA** Pitch Grant, "Exploring Biomolecular Condensates with Physics-Informed Machine Learning on Intrinsically Disordered Proteins", $100,000, 12/2024-6/2025

POSITIONS, HONORS & AWARDS

Tutorial Speaker, IEEE ICASSP Conference	2025
Session Chair, IEEE ICASSP Conference	2025
Session Chair, Asilomar Conference	2024
Outstanding Dissertation Award, School of EECS, Oregon State University	2024
Selected Participant & Travel Grant, NSF Workshop	2024
Travel Grant, ICML Women in Machine Learning Workshop	2023
Travel Grant, NeurIPS Women in Machine Learning Workshop	2022
Area Chair, Women in Machine Learning Workshop, NeurIPS	2022
Selected Participant of Progress Workshop, ICIP	2020
Travel Grant, NeurIPS Conference	2019
NSF Travel Grant, IEEE Data Science Workshop	2019
ECEN Departmental Merit Scholarship, Texas A&M University	2017
Best Paper Award, Texas Instruments India Technical Conference	2017

INVITED TALKS

Multi-label Recognition under Noisy Supervision:
A Confusion Mixture Modeling Approach
IEEE ICASSP Conference, Hyderabad, India — *April 2025*

End-to-End Learning from Crowdsourced Labels:
A Signal Processing Perspective
Tutorial at IEEE ICASSP Conference, Hyderabad, India — *April 2025*

Deep Learning under Instance-dependent Label Noise:
A Tensor Factorization Perspective
Asilomar Conference on Signals, Systems, and Computers — *Oct 2024*

Robust Learning for Artificial Intelligence
AI Club Seminar, National Institute of Technology, Calicut, India — *Oct 2024*

Ensuring Robustness in Machine Learning by Combating
Real-world Data Uncertainties
CECS Seminar, University of Central Florida, Orlando, FL — *Mar 2024*

Provably Robust Learning: A Tale of Tackling Label Noise
through Naïve Bayes to Deep Neural Networks
Invited Talk, Washington State University, Pullman, WA — *Aug 2023*

Towards Efficient Learning under Label Noise: From Dawid-Skene
to Deep Neural Networks
Invited Talk, AI Initiative, University of Central Florida, Orlando, FL — *Jun 2023*

Under-Counted Tensor Completion with Neural Incorporation of Attributes
SIAM OP23, Seattle, WA — *Jun 2023*

Learning from Noisy Labels with Theoretical Guarantees
Invited Talk, CSE, University of Texas, Arlington, TX — *Mar 2023*

Crowdsourcing via Annotator Co-occurrence Imputation &
Provable Symmetric Nonnegative Matrix Factorization
ICML, Virtual Talk *Jul 2021*

Learning Mixed Membership from Adjacency Graph via
Systematic Edge Query: Identifiability and Algorithm
ICASSP, Virtual Talk *Jun 2021*

Recovering Joint PMF from Pairwise Marginals
Asilomar Signal Processing Conference, Virtual Talk *Nov 2020*

Stochastic Optimization for Coupled Tensor Decomposition with
Applications in Statistical Learning
IEEE Data Science Workshop, Minnesota, MN *Jun 2019*

Crowdsourcing via Pairwise Co-occurrences: Identifiability & Algorithms
Artificial Intelligence Seminar, Oregon State University *Mar 2019*

Crowdsourcing via Pairwise Co-occurrences: Identifiability & Algorithms
Signal Processing Seminar, Oregon State University *Feb 2019*

TEACHING

Instructor, EEL6812 Introduction to Neural Networks and Deep Learning
Dept. of ECE, University of Central Florida, Orlando, FL *Spring 2025*
No of Students: 42

Instructor, EEL4815 Topics in Machine Learning
Dept. of ECE, University of Central Florida, Orlando, FL *Fall 2024*
No of Students: 12, Avg. SPI: 4.00

Instructor, EEL6812 Introduction to Neural Networks and Deep Learning
Dept. of ECE, University of Central Florida, Orlando, FL *Spring 2024*
No of Students: 36, Avg. SPI: 4.75

Guest Lecturer, ECE586/AI586 Applied Matrix Analysis
EECS, Oregon State University, Corvallis, OR *Spring 2023*

Guest Lecturer, ECE569/CS539 Convex Optimization
EECS, Oregon State University, Corvallis, OR *Fall 2020*

STUDENT ADVISING & MENTORING

Ph.D. Advisor
Tarhib Al Azad
PhD in Electrical and Computer Engineering
University of Central Florida *2024 - Present*

Ph.D. Advisor

Faizul Rakib Sayem
PhD in Electrical and Computer Engineering
University of Central Florida *2024 - Present*

Masters Advisor
Diego Linares Gonzalez
Master of Science in Electrical and Computer Engineering
University of Central Florida *2024 - Present*

Masters Advisor
Chinmay Dhanraj Nehate
Master of Science in Electrical and Computer Engineering
University of Central Florida *2024 - Present*

Thesis Committe Member
Daniel Grey Wolnick
Bachelor of Science in Computer Science
Oregon State University *2022 - 2023*

Research Mentor
Ezra Baker
Bachelor of Science in Mathematics & Computer Science
Oregon State University *2022*

Research Mentor
Grace Strid
Bachelor of Science in Mathematics
Oregon State University *2020*

REVIEWING

Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence	2025
Reviewer, NeurIPS	2025
Reviewer, International Conference on Computer Vision	2025
Reviewer, International Joint Conference on Neural Networks	2025
Reviewer, IEEE Transactions of Signal Processing	2025
Reviewer, ICASSP	2025
Reviewer, ICLR	2025
Program Committee, AAAI Conference on Artificial Intelligence	2025
Reviewer, NeurIPS	2024
Reviewer, SIAM Journal on Imaging Sciences	2024
Reviewer, SIAM Journal on Imaging Sciences	2024
Reviewer, Transactions on Knowledge and Data Engineering	2024
Reviewer, EUSIPCO	2024
Reviewer, International Journal of Computer Vision	2024
Reviewer, IEEE Transactions of Signal Processing	2024
Program Committee, AISTATS	2024
Program Committee, AAAI Conference on Artificial Intelligence	2024

Reviewer, Women in Machine Learning Workshop 2023
Reviewer, Signal Processing 2023
Reviewer, IEEE Transactions on Pattern Analysis and Machine Intelligence 2023
Reviewer, EUSIPCO 2023
Reviewer, IEEE Statistical Signal Processing Workshop 2023
Reviewer, IEEE Transactions of Signal Processing 2023
Reviewer, AISTATS 2023
Auxilliary Reviewer, ICASSP 2023
Reviewer, AISTATS 2022
Reviewer, Journal of Optimization Theory & Applications 2022
Reviewer, Journal of Selected Topics in Signal Processing 2021
Auxilliary Reviewer, ICASSP 2021
Reviewer, AISTATS 2020
Auxilliary Reviewer, IEEE MLSP Worskshop 2019

SERVICE & OUTREACH

Vice Chair
IEEE Orlando Signal Processing Society Chapter *2025 - present*

Member
UCF ECE Graduate Committee *2024 - present*

Member
IEEE Women in Engineering *2023 - present*

Member
Women in Machine Learning *2021 - present*

Member
IEEE Signal Processing Society *2019 - present*