# Trung Vu, Ph.D.

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| CONTACT INFORMATION | 363 Information Technology and Engineering Building<br>University of Maryland, Baltimore County (UMBC)<br>1000 Hilltop Circle, Baltimore, MD 21250, USA | Phone: (+1) 541-745-9676<br>Email: trungvv@umbc.edu<br>Web: trungvietvu.github.io |

**EDUCATION**

**Oregon State University (OSU)**, Corvallis, OR 97330, USA  2016-2022
Ph.D., Computer Science  Advisor: Raviv Raich
Dissertation: Convergence Analysis Framework for Fixed-Point Algorithms in Machine Learning and Signal Processing

**Hanoi University of Science and Technology (HUST)**, Hanoi, Vietnam  2009 - 2014
B.Eng., Computer Science, *Honors program*: Talented Engineers

**RESEARCH INTEREST**

Optimization methods, convergence analysis, independent component/vector analysis, blind source separation, machine learning for signal processing

**WORK EXPERIENCES**

**Postdoctoral Research Associate at UMBC**  2023–now
- Supervisor: Tülay Adalı
- Description:
  - Developing efficient data-driven methods for fMRI data analysis, with a focus on independent component/vector analysis (ICA/IVA) for joint blind source separation (BSS) — authored in 1 journal paper and 2 conference papers; co-authored 1 journal paper and 3 conference papers
  - Writing 1 grant proposal, mentoring 3 graduate students in the MLSP lab at UMBC, giving 2 guest lectures in ENEE 718 (optimization methods) and being co-instructor in ENEE 620 (probability and random processes)

**Teaching Assistant (TA) at OSU**  2016–2022
- Supervisor: Eric Ianni
- Courses: CS 290 - Web Development (8 quarters), CS 362  Software Engineering II (1 quarter), ECE 464/564 - Digital Signal Processing (1 quarter), CS 261 - Data Structures (1 quarter), CS 271 - Computer Architecture and Assembly Language (2 quarters)
- Description: Grading homework assignments and exams, holding weekly office hours and review sessions, revising course materials (improving structure and strengthening assessments)

**Head TA at OSU**  2022
- Courses: CS 290 - Web Development (2 quarters)
- Description: Leading a group of 6 TAs to ensure the service quality of a class of 200 students, communicating with both instructors and TAs about weekly duties and grading progress, setting an example for other TAs to follow

**SELECTED PUBLICATIONS**

## Journals

1. **Trung Vu**, Francisco Laport, and Hanlu Yang, Vince D. Calhoun, and Tülay Adalı, "Constrained Independent Vector Analysis with Reference for Multi-Subject fMRI Analysis", 2023 (Under review)

2. **Trung Vu**, Raviv Raich, and Xiao Fu, "On Local Linear Convergence of Gradient Projection for Unit-Modulus Least Squares", IEEE Transactions on Signal Processing, vol. 71, pp. 3883–3897, 2023

3. Hanlu Yang, **Trung Vu**, Qunfang Long, Vince Calhoun, and Tülay Adali. "Identification of Homogeneous Subgroups from Resting-State fMRI Data", Sensors, no. 6, vol. 23, pp. 3264, 2023

4. **Trung Vu**, Evgenia Chunikhina, and Raviv Raich, "On Asymptotic Linear Convergence Rate of Iterative Hard Thresholding for Matrix Completion", IEEE Transactions on Signal Processing, vol. 70, pp. 5940–5953, 2022

5. **Trung Vu** and Raviv Raich, "On Asymptotic Linear Convergence of Projected Gradient Descent for Constrained Least Squares", IEEE Transactions on Signal Processing, vol. 70, pp. 4061–4076, 2022

6. **Trung Vu** and Raviv Raich, "A Closed-Form Bound on the Asymptotic Linear Convergence of Iterative Methods via Fixed Point Analysis", Optimization Letters, vol. 1, pp. 1–14, 2022

7. **Trung Vu**, Evgenia Chunikhina, and Raviv Raich, "Perturbation Expansions and Error Bounds for the Truncated Singular Value Decomposition", Linear Algebra and Its Applications, vol. 627, pp. 94–139, 2021.

8. **Trung Vu**, Phung Lai, Raviv Raich, Anh Pham, Xiaoli Z. Fern and UK Arvind Rao, "A Novel Attribute-based Symmetric Multiple Instance Learning for Histopathological Image Analysis", IEEE Transactions on Medical Imaging, vol. 39, no. 10, pp. 3125–3136, 2020

## Conference papers

1. Matthew Callahan, **Trung Vu** and Raviv Raich, "Provable Randomized Coordinate Descent For Matrix Completion", In Proceedings of IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP), pp. 3240–3244. IEEE, 2021

2. Hanlu Yang, Meiby Ortiz-Bouza, **Trung Vu**, Francisco Laport, Ben Gabrielson, Vince D. Calhoun, Selin Aviyente, and Tülay Adalı, "Subgroup Identification Through Multiplex Community Structure Within Functional Connectivity Networks", In Proceedings of IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP). IEEE, 2024 (Accepted)

3. **Trung Vu**, Hanlu Yang, Francisco Laport, Ben Gabrielson, Vince D. Calhoun, and Tülay Adalı, "A Robust and Scalable Method with an Analytic Solution for Multi-Subject fMRI Data Analysis", In Proceedings of IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP). IEEE, 2024 (Accepted)

4. **Trung Vu**, Francisco Laport, Hanlu Yang, and Tülay Adalı, "Constrained Independent Vector Analysis with References: Algorithms and Performance Evaluation", In Asilomar Conference on Signals, Systems, and Computers. IEEE, 2023

5. Francisco Laport, **Trung Vu**, Hanlu Yang, Vince Calhoun, and Tülay Adalı, "Reproducibility in Joint Blind Source Separation: Application to fMRI Analysis", In Asilomar Conference on Signals, Systems, and Computers. IEEE, 2023

6. **Trung Vu** and Raviv Raich, "On the Asymptotic Linear Convergence of Gradient Descent for Nonsymmetric Matrix Completion", In Asilomar Conference on Signals, Systems, and Computers. IEEE, 2023

7. **Trung Vu** and Raviv Raich, "Exact Linear Convergence Rate Analysis for Low-Rank Symmetric Matrix Completion via Gradient Descent", In Proceedings of IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP), pp. 3240–3244. IEEE, 2021

8. **Trung Vu**, Raviv Raich, and Xiao Fu, "On Convergence of Projected Gradient Descent for Minimizing a Large-scale Quadratic over the Unit Sphere", In Proceedings of IEEE International Workshop on Machine Learning for Signal Processing (MLSP), pp. 1–6. IEEE, 2019 — **Student Paper Award!**

9. **Trung Vu** and Raviv Raich, "Local Convergence of the Heavy Ball method in Iterative Hard Thresholding for Low-Rank Matrix Completion", In Proceedings of IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP), pp. 3417–3421. IEEE, 2019

10. **Trung Vu** and Raviv Raich, "Accelerating Iterative Hard Thresholding for Low-Rank Matrix Completion via Adaptive Restart", In Proceedings of IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP), pp. 2917–2921. IEEE, 2019

11. **Trung Vu**, Raviv Raich, "Adaptive Step Size Momentum Method For Deconvolution", In Proceedings of IEEE Statistical Signal Processing Workshop (SSP), pp. 438–442. IEEE, 2018

## Reviewer for journals and conferences

ICASSP 2018-2024 — 37 papers; MLSP 2018-2023 — 8 papers; IEEE Transactions on Signal Processing — 1 journal; Numerical Mathematics 2022 — 1 journal; IEEE Transactions on Medical Imaging 2022 — 1 journal; Signal Processing 2023 — 1 journal

## Talks

- Constrained Independent Vector Analysis with Reference for Multi-Subject fMRI Analysis, *IEEE Brain Discovery and Neurotechnology Workshop 2023*, Nov 9-10, Washington DC, USA (Poster)
- Constrained Independent Vector Analysis with References: Algorithms and Performance Evaluation, *ASILOMAR 2023*, Oct 28-31, California, USA (Poster)
- On Asymptotic Linear Convergence of Projected Gradient Descent for Constrained Least Squares, *IEEE SPS Technical Seminar 2022*, July 12, Oregon, USA (Presentation)
- On Convergence of Projected Gradient Descent for Minimizing a Large-scale Quadratic over the Unit Sphere, *MLSP 2019*, October 13-16, Pennsylvania, USA (Presentation)
- Accelerating Iterative Hard Thresholding for Low-Rank Matrix Completion via Adaptive Restart, *ICASSP 2019*, May 11-17, Brighton, UK (Presentation)
- Local Convergence of the Heavy Ball method in Iterative Hard Thresholding for Low-Rank Matrix Completion, *ICASSP 2019*, May 11-17, Brighton, UK (Poster)
- Adaptive Step Size Momentum Method for Deconvolution, *SSP 2018*, June 10-13, Freiburg, Germany (Poster)
- Accelerating Iterative Hard Thresholding for Low-Rank Matrix Completion via Adaptive Restart, *Signal Processing group*, March 1, 2019, Oregon, USA (Departmental Talk)

REFERENCES

**Dr. Raviv Raich**
Associate Professor                                    E-mail: raich@eecs.oregonstate.edu
School of Electrical Engineering and Computer Science                  Phone: 541-737-9862
Oregon State University, Corvallis, Oregon
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