

LIANGZU PENG

[Homepage] [OpenReview] [Google Scholar] [lpenn@seas.upenn.edu] [+1 (667) 910 4063]

EDUCATION

- University of Pennsylvania*, Philadelphia, USA August 2023 – Now
Ph.D. in Electrical and Systems Engineering
Advisor: Dr. René Vidal
- Johns Hopkins University*, Baltimore, USA August 2021 – May 2023
Ph.D. in Electrical and Computer Engineering
(Transferred to UPenn)
- ShanghaiTech University*, Shanghai, China September 2017 – June 2021
M.S. in Computer Science
Thesis: From Linear Regression Without Correspondences to Homomorphic Sensing
- Zhejiang University*, Hangzhou, China September 2013 – June 2017
B.Eng. in Measurement Control Technology and Instruments
Thesis: Image Measurement Software for Visual Detection

WORK EXPERIENCE

- Research Intern*, Alibaba DAMO Academy, Bellevue, WA, USA May 2023 – August 2023
Mentors: Dr. Xinshang Wang, Dr. Wotao Yin
- Teaching Associate*, NYU Shanghai, China September 2020 – May 2021
Instructor: Dr. Siyao Guo
- Intern*, NYU Shanghai, China February 2020 – June 2020
Instructor: Dr. Irith Hartman

PUBLICATIONS

(Co-)First Author Papers.

- Block Acceleration Without Momentum: On Optimal Stepsizes of Block Gradient Descent for Least-Squares
[Spotlight Presentation](#)
LP and Wotao Yin
[ICML 2024]
- Scalable 3D Registration via Truncated Entry-wise Absolute Residuals
Tianyu Huang*, **LP***, René Vidal, and Yun-Hui Liu
[CVPR 2024] [[arXiv](#)] [*: Equal Contribution]
- HARD: Hyperplane ARangement Descent
Tianjiao Ding*, **LP***, and René Vidal
[CPAL 2024, [Oral Presentation](#)] [*: Equal Contribution]
- Block Coordinate Descent on Smooth Manifolds: Convergence Theory and Twenty-One Examples
LP and René Vidal
[[arXiv](#)]
- The Ideal Continual Learner: An Agent That Never Forgets

LP, Paris V. Giampouras, and René Vidal
[ICML 2023] [OpenReview] [CLVision Workshop 2023] [arXiv] [poster]

6. On the Convergence of IRLS and Its Variants in Outlier-Robust Estimation

[Highlight, 235/9155 \$\approx\$ 2.5% Acceptance Rate](#)

LP, Christian Kümmerle, and René Vidal
[CVPR 2023] [pdf] [talk video] [slides] [poster]

7. Global Linear and Local Superlinear Convergence of IRLS for Non-Smooth Robust Regression

LP, Christian Kümmerle, and René Vidal
[NeurIPS 2022] [OpenReview] [arXiv] [code] [slides] [poster]

8. Semidefinite Relaxations of Truncated Least-Squares in Robust Rotation Search: Tight or Not

[Oral Presentation, 158/5803 \$\approx\$ 2.7% Acceptance Rate](#)

LP, Mahyar Fazlyab, and René Vidal
[ECCV 2022] [arXiv] [slides] [talk video] [poster]

9. ARCS: Accurate Rotation and Correspondence Search

[Oral Presentation, 342/8161 \$\approx\$ 4.2% Acceptance Rate](#)

LP, Manolis C. Tsakiris, and René Vidal
[CVPR 2022] [arXiv] [code] [slides] [talk video] [poster]

10. Homomorphic Sensing: Sparsity and Noise

LP, Boshi Wang, and Manolis C. Tsakiris
[ICML 2021] [pdf] [talk video]

11. Algebraically-Initialized Expectation Maximization for Header-Free Communication

LP, Xuming Song, Manolis C. Tsakiris, Hayoung Choi, Laurent Kneip, and Yuanming Shi
[ICASSP 2019] [pdf]

12. Homomorphic Sensing of Subspace Arrangements

[Applied and Computational Harmonic Analysis, 2021](#)

LP and Manolis C. Tsakiris
[arXiv]

13. Linear Regression Without Correspondences via Concave Minimization

IEEE Signal Processing Letters, 2020
LP and Manolis C. Tsakiris
[arXiv] [code]

Other Papers.

1. Efficient and Robust Point Cloud Registration via Heuristics-based Parameter Search

Tianyu Huang, Haoang Li, **LP**, Yinlong Liu, and Yun-Hui Liu
[IEEE Transactions on Pattern Analysis and Machine Intelligence, 2024](#)
[arXiv]

2. Unlabeled Principal Component Analysis and Matrix Completion

Yunzhen Yao, **LP**, and Manolis C. Tsakiris
[Journal of Machine Learning Research, 2024](#)
[JMLR Site] [arXiv]

3. Accelerating Globally Optimal Consensus Maximization in Geometric Vision
Xinyue Zhang, [LP](#), Wanting Xu, and Laurent Kneip
[IEEE Transactions on Pattern Analysis and Machine Intelligence](#), 2024
[\[arXiv\]](#)
4. Unlabeled Principal Component Analysis
Yunzhen Yao, [LP](#), and Manolis C. Tsakiris
[\[NeurIPS 2021\]](#) [\[OpenReview\]](#) [\[arXiv\]](#) [\[code\]](#)
5. Unsigned Matrix Completion
Yunzhen Yao, [LP](#), and Manolis C. Tsakiris
[\[ISIT 2021\]](#) [\[pdf\]](#)
6. An Algebraic-Geometric Approach to Linear Regression Without Correspondences
[IEEE Transactions on Information Theory](#), 2020
Manolis C. Tsakiris, [LP](#), Aldo Conca, Laurent Kneip, Yuanming Shi, and Hayoung Choi
[\[arXiv\]](#) [\[code\]](#)
7. Homomorphic Sensing
Manolis C. Tsakiris and [LP](#)
[\[ICML 2019\]](#) [\[arXiv\]](#) [\[code\]](#)

HONORS AND AWARDS

Top Reviewer @NeurIPS 2022	2022
Highlighted Reviewer @ICLR 2022	2022
The Dean's Fellowship @UPenn	August 2023 – Now
GRO Conference Grants @JHU	June 2022
MINDS PhD Fellowship @JHU	Spring 2022

TALKS

<i>Low-rank Matrix Recovery From Unlabeled Data With Missing Entries</i> @INFORMS Annual Meeting, Phoenix, Arizona [slides]	October 2023
<i>The Ideal Continual Learner: An Agent That Never Forgets</i> @AI TIME (Youth PhD Talk), Virtual [slides]	June 15, 2023
<i>Fantastic Iteratively Reweighted Algorithms and Where to Find Them</i> @SIAM Conference on Optimization, Seattle, Washington [slides]	June 1, 2023
<i>A Tale of Two Villains: Bandit, Procrustes, and Their Regrets</i> TheoriNet Retreat @Flatiron Institute, New York City [slides]	September 28, 2022
<i>Rotation Search: Optimization Theory and Algorithms</i> @AI TIME (Youth PhD Talk), Virtual [slides v4]	December 8, 2022
@Center for Applied Mathematics of Henan Province, China, Virtual [slides v3]	September 23, 2022
@Vision Lab Retreat, Johns Hopkins University [slides v2]	September 9, 2022
@VITA, University of Texas at Austin, Virtual [slides v1]	August 17, 2022

<i>Semidefinite Relaxations in Robust Rotation Search: Tight or Not</i> @ECCV, Virtual [slides]	October 2022
@ICCOPT, Bethlehem, Pennsylvania [slides]	July 2022
<i>ARCS: Accurate Rotation and Correspondence Search</i> @CVPR, New Orleans, Louisiana [slides] [talk video]	June 2022

PROFESSIONAL SERVICE

Organizer:

Mini-Symposium @SIAM Conference on Optimization with Christian Kümmerle and René Vidal “Iteratively Reweighted Algorithms in Data Science: From Convexity to Nonconvexity”	May 2023
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Reviewer:

Conference on Uncertainty in Artificial Intelligence (2023)
 International Conference on Computer Vision (2023)
 IEEE International Conference on Acoustics, Speech and Signal Processing (2023)
 International Conference on Artificial Intelligence and Statistics (2023, 2024)
 Learning on Graphs Conference (2022)
 European Conference on Computer Vision (2022, 2024)
 Computer Vision and Pattern Recognition (2022 – 2024)
 International Conference on Learning Representations (2022 – 2024)
 Neural Information Processing Systems (2021 – 2023)
 International Conference on Machine Learning (2021 – 2024)
 zbMATH Open (2021 - 2023)
 IEEE Transactions on Pattern Analysis and Machine Intelligence
 IEEE Transactions on Signal Processing
 IEEE Robotics and Automation Letters
 Transactions on Machine Learning Research
 Journal of Machine Learning Research

TEACHING

Recitation Instructor:

CSCI-SHU 220, Algorithms	Spring 2021, NYU-Shanghai
CSCI-SHU 220, Algorithms	Fall 2020, NYU-Shanghai
CSCI-SHU 2314, Discrete Mathematics	Spring 2020, NYU-Shanghai

Teaching Assistant:

SI 232, Subspace Learning	Fall 2020, ShanghaiTech
CSCI-SHU 220, Algorithms	Spring 2020, NYU-Shanghai
MATH 2111, Topological Data Analysis	Spring 2020, ShanghaiTech
SI 232, Subspace Learning	Fall 2019, ShanghaiTech
CS 133, Advanced C++ Programming	Spring 2019, ShanghaiTech
SI 192, Applied Algebraic Geometry	Spring 2019, ShanghaiTech
SI 112, Advanced Geometry	Spring 2018, ShanghaiTech