

# LIANGZU PENG

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## EDUCATION

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

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## WORK EXPERIENCE

<i>Research Intern</i> , Alibaba DAMO Academy, Bellevue, WA, USA Mentors: Dr. Xinshang Wang, Dr. Wotao Yin	May 2023 – August 2023
<i>Research Assistant</i> , Johns Hopkins University, Baltimore, USA Advisor: Dr. René Vidal	August 2021 – May 2023
<i>Teaching Associate</i> , NYU Shanghai, China Instructor: Dr. Siyao Guo	September 2020 – May 2021
<i>Intern</i> , NYU Shanghai, China Instructor: Dr. Irith Hartman	February 2020 – June 2020

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## PUBLICATIONS

### First Author Papers.

- Block Coordinate Descent on Smooth Manifolds  
[LP](#) and René Vidal  
[Preprint] [arXiv]
- The Ideal Continual Learner: An Agent That Never Forgets  
[LP](#), Paris V. Giampouras, and René Vidal  
[ICML 2023] [OpenReview] [CLVision Workshop 2023] [arXiv] [bib]
- 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] [video] [slides] [bib]

4. Global Linear and Local Superlinear Convergence of IRLS for Non-Smooth Robust Regression  
LP, Christian Kümmerle, and René Vidal  
[NeurIPS 2022] [OpenReview] [arXiv] [code] [bib]
5. 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] [poster] [talk video] [bib]
6. 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] [bib]
7. Homomorphic Sensing: Sparsity and Noise  
LP, Boshi Wang, and Manolis C. Tsakiris  
[ICML 2021] [pdf] [talk video] [bib]
8. Algebraically-Initialized Expectation Maximization for Header-Free Communication  
LP, Xuming Song, Manolis C. Tsakiris, Hayoung Choi, Laurent Kneip, and Yuanming Shi  
[ICASSP 2019] [pdf] [bib]
9. Homomorphic Sensing of Subspace Arrangements  
Applied and Computational Harmonic Analysis, 2021  
LP and Manolis C. Tsakiris  
[arXiv] [bib]
10. Linear Regression Without Correspondences via Concave Minimization  
IEEE Signal Processing Letters, 2020  
LP and Manolis C. Tsakiris  
[arXiv] [code] [bib]

*Other Papers.*

1. Accelerating Globally Optimal Consensus Maximization in Geometric Vision  
Xinyue Zhang, LP, Wanting Xu, and Laurent Kneip  
[Preprint] [arXiv]
2. HARD: Hyperplane ARangement Descent  
Tianjiao Ding, LP, and René Vidal  
[Preprint]
3. Unlabeled Principal Component Analysis  
Yunzhen Yao, LP, and Manolis C. Tsakiris  
[NeurIPS 2021] [OpenReview] [arXiv] [code] [bib]
4. Unsigned Matrix Completion  
Yunzhen Yao, LP, and Manolis C. Tsakiris  
[ISIT 2021] [pdf] [bib]
5. Homomorphic Sensing  
Manolis C. Tsakiris and LP

[ICML 2019] [arXiv] [code] [bib]

## 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] [bib]

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## 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

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## 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

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## 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)  
Learning on Graphs Conference (2022)  
European Conference on Computer Vision (2022)  
Computer Vision and Pattern Recognition (2022, 2023)  
International Conference on Learning Representations (2022, 2023)  
Neural Information Processing Systems (2021 – 2023)  
International Conference on Machine Learning (2021 – 2023)  
zbMATH Open (2021 - 2023)  
IEEE Transactions on Pattern Analysis and Machine Intelligence (1)  
IEEE Transactions on Signal Processing (1)  
IEEE Robotics and Automation Letters (1)  
Transactions on Machine Learning Research

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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 <sup>1</sup>	Spring 2018, ShanghaiTech

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<sup>1</sup>Lecture notes available: <http://www.liangzu.org/en/ag-notes.html>