Chao Wang

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Employment & Experience

Southern University of Science and Technology		Guangdong, China
•	Assistant Professor at Dept. Statistic & Data Science	Sep. 2021 - Present
University of California, Davis		California, USA
•	Postdoctoral Researcher at TETRAPODS Institute of Data Science	Jul. 2020 - Present
	Advisors: Prof. Chen-Nee Chuah & Prof. Nina Amenta	
Unive	rsity of Texas (UT) Southwestern Medical Center & UT Dallas	Texas, USA
٠	Postdoctoral Researcher at Medical Artificial Intelligence and Automation Lab Advisors: Prof. Xun Jia & Prof. Yifei Lou	Oct. 2018 - Jun. 2020
Educ	ation	
The C	hinese University of Hong Kong	Hong Kong
•	Ph.D. in Mathematics (GPA: 3.92/4.00)	2015 - 2018
	Advisor: Prof. Raymond H. Chan	
	Dissertation: Sparse Recovery Algorithms for 3D Imaging Using Point Spread Fu	unction Engineering
Shant	Dissertation: Sparse Recovery Algorithms for 3D Imaging Using Point Spread Fu ou University	unction Engineering Shantou, China
Shant •	Dissertation: Sparse Recovery Algorithms for 3D Imaging Using Point Spread Fu ou University M.Sc. in Applied Mathematics (GPA: 3.84/4.00)	unction Engineering Shantou, China 2012 - 2015
Shant •	Dissertation: Sparse Recovery Algorithms for 3D Imaging Using Point Spread Fu ou University M.Sc. in Applied Mathematics (GPA: 3.84/4.00) Advisor: Prof. Fu-Rong Lin	unction Engineering Shantou, China 2012 - 2015
Shant •	Dissertation: Sparse Recovery Algorithms for 3D Imaging Using Point Spread Fu ou University M.Sc. in Applied Mathematics (GPA: 3.84/4.00) Advisor: Prof. Fu-Rong Lin Thesis: Research on Regularization Parameter Selection Methods in Inverse Pro	unction Engineering Shantou, China 2012 - 2015 oblems
Shant • Hansh	Dissertation: Sparse Recovery Algorithms for 3D Imaging Using Point Spread Fu ou University M.Sc. in Applied Mathematics (GPA: 3.84/4.00) Advisor: Prof. Fu-Rong Lin Thesis: Research on Regularization Parameter Selection Methods in Inverse Pro an Normal University	unction Engineering Shantou, China 2012 - 2015 oblems Chaozhou, China

Research Interests

Scientific Computing, Image Processing, Interdisciplinary Mathematical Modeling, Deep Learning, Compressed Sensing, Convex and Nonconvex Optimization, Hyperspectral Imaging, Tensor Computation

Grants

Investigator, NSFC (300,000 RMB) 202		2023-2025
• The Study of Point Spread Function-based Deep Learning Models and Algorithms for Th		dimensional
	Point Source Localization	
Investigator, Guangdong Basic and Applied Basic Research Foundation (150,000 RMB) 2024-2		2024-2026
•	The Study of Single-lobe Point Spread Function-based approach for Three-dimensional Point	Source
	Localization and Tracking	
Investigator, Shenzhen Science and Technology Program (500,000 RMB) 2023		2023-2025
•	Tensor Reconstruction Models and Algorithms in Brain Imaging	
Investigator, SUSTech Teaching Reform Project (40,000 RMB) 2024-2025		2024-2025
•	Teaching Reform on Constructivism-based "Operational Research and Optimization"	
Co-Investigator, Shenzhen Fundamental Research Program (1,500,000 RMB)20		2023-2026
•	Algorithms Study on Early Diagnosis Systems for Neurodegenerative Disease	

Co-Investigator, HKRGC Grant (600,000 HKD)

• Novel Computational Methods for 3D Point Source Localization based on Point Spread Function Analytics

Core-member, National Key R&D Program of China (11,100,000 RMB)2024-2026

• The Mathematical Issues and Their Applications in the Construction and Analysis of Brain Dynamic Imaging

Publications

Preprint (* indicates corresponding author, # indicates co-first author)

- [1] **C. Wang**, H. Zheng, R. Chan, Y. Wen*. "Variational Bayesian inference for tensor robust principal component analysis" arXiv preprint arXiv: 2412.18717
- [2] T. Wang#, Z. Yan#, J. Li, X. Zhao, **C. Wang***, M. Ng. "Hyperspectral and multispectral image fusion with arbitrary resolution through self-supervised representations" arXiv preprint arXiv: 2405.17818
- [3] GB. Rehm, C. Wang, I. Cortes-Puch, CN. Chuah, J. Adams. "Deep learning-based detection of the acute respiratory distress syndrome: what are the models learning? "arXiv preprint arXiv:2109.12323

Accepted/ Published

- [4] M. Lu, Z. Ao, **C. Wang***, S. Prasad, R. Chan*, "PiLocNet: Physics-informed neural network on 3D localization with rotating point spread function" *Applied Optics*, 2025. (to appear)
- [5] H. Zheng, Y. Lou, G. Tian, **C. Wang***. "Tensor robust principal component analysis via the tensor nuclear over Frobenius norm" *Journal of Scientific Computing*, 2025. (to appear)
- [6] S. Niu#, L. Lin#, J. Huang, **C. Wang***. "OwMatch: conditional self-labeling with consistency for openworld semi-supervised learning" *Neural Information Processing Systems (NeurIPS)*, 2024.
- [7] **C. Wang,** JF. Aujol, G. Gilboa, Y. Lou.* "Minimizing quotient regularization model" *Inverse Problems and Imaging*. Doi: 10.3934/ipi.2024041, 2024.
- [8] J. Li, X. Zhao*, J. Wang, C. Wang, M. Wang. "Superpixel-informed implicit neural representation for multi-dimensional data". European Conference on Computer Vision (ECCV), 2024
- [9] G. Li, Z, Tu, J. Lu, **C. Wang**, L. Shen. "Multi-dimensional image recovery via Self-Supervised Nonlinear Transform Based a Three-Directional Tensor Nuclear Norm" *Numerical Mathematics: Theory, Methods and Applications*, 17(3), 727-750, 2024.
- [10] M. Chowdhury*, C. Wang, Y. Lou. "Poissonian Image Restoration via the L1/L2-based minimization" Journal of Scientific Computing, 101:17, 2024
- [11] L. Luo, Z. Tu, J. Lu, **C. Wang**, C. Xu. "A nonlinear high-order transformations-based method for high-order tensor completion". *Signal Processing*, 109514, 2024.
- [12] H. Zheng, Y. Lou, G. Tian, **C. Wang***. "A scale-invariant relaxation in low-rank tensor recovery with an application to tensor completion". *SIAM Journal on Imaging Sciences*, 17(1),756-783, 2024.
- [13] J. Lu, J. Zhang, C. Wang, C. Deng. "Hyperspectral sparse fusion using adaptive total variation regularization and superpixel-based weighted nuclear norm". *Signal Processing*, 220, 109449, 2024.
- [14] C. Wang*, M. Yan, J. Yu. "Sorted L1/L2 Minimization for Sparse Signal Recovery". *Journal of Scientific Computing*, 99(32),2024.
- [15] T. Wang, J. Li, M. Ng, C. Wang*. "Nonnegative matrix functional factorization for hyperspectral unmixing with non-uniform spectral sampling". *IEEE Transactions on Geoscience and Remote Sensing* 62, 1-13, 2024.
- [16] T. Wang, X. Wu, J. Li*, **C. Wang***. "Robust retrieval of material chemical states in X-ray microspectroscopy". *Optics Express*, 31(25), 42524-42538, 2023.

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- [17] L. Dai, M. Lu, C. Wang*, S. Prasad, R. Chan*. "LocNet: Deep Learning-based Localization on Rotating Point Spread Function with Applications to Telescope Imaging". Optics Express, 31(24), 39341-39355, 2023.
- [18] J. Zhang, J. Lu, C. Wang, S. Li*. "Hyperspectral and multispectral image fusion via superpixel-based weighted nuclear norm minimization". *IEEE Transactions on Geoscience and Remote Sensing*. 5521612. 2023.
- [19] J. Yang, M. Ma, J. Zhang, **C. Wang***. "Noise removal using an adaptive Euler's elastica-based model." *the Visual Computing*. 1-12. 2022
- [20] Z. Lai#, C. Wang#, H. Gunawan, SC. Cheung, CN. Chuah. "Smoothed adaptive weighting for imbalanced semi-supervised learning: improve reliability against unknown distribution." The International Conference on Machine Learning (ICML). 2022.
- [21] D. Sprouts, Y. Gao, C. Wang, X. Jia, C. Shen, Y. Chi "The development of a deep reinforcement learning network for dose-volume-constrained treatment planning in prostate cancer intensity modulated radiotherapy" *Biomedical Physics & Engineering Express*. 8 (4), 045008, 2022. https://doi.org/10.1088/2057-1976/ac6d82
- [22] Z. Lai#, C. Wang#, SC. Cheung, CN. Chuah. "SaR: Self-adaptive refinement on pseudo labels for multiclass-imbalanced semi-supervised learning" *The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) workshop*, pp. 4091-4100, 2022.
- [23] **C. Wang**, M. Tao, CN. Chuah, J. Nagy, and Y. Lou^{*}. "Minimizing L₁ over L₂ norms on the gradient." *Inverse Problems.* 39 065011, 2022.
- [24] C. Wang, H. Jung, M. Yang, C. Shen, X. Jia*, "Simultaneous image reconstruction and element decomposition for iodine contrast agent visualization in multi-energy element-resolved cone beam CT", Frontiers in Oncology, 113, 2022.
- [25] Z. Lai*, C. Wang#, L. Oliveira, B. Dugger, SC. Cheung, CN. Chuah, "Joint semi-supervised and active learning for segmentation of gigapixel pathology images with cost-effective labeling," *Proceedings* of the IEEE/CVF International Conference on Computer Vision, 591-600, 2021.
- [26] Z. Lai, C. Wang, Z. Hu, B. Dugger, SC. Cheung, CN. Chuah*, "A semi-supervised learning for segmentation of gigapixel histopathology images from brain tissues", International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2021.
- [27] **C. Wang***, M. Tao, J. Nagy, and Y. Lou. "Limited-angle CT reconstruction via the L_1/L_2 minimization." *SIAM Journal on Imaging Sciences.* 14(2), 749–777, 2021.
- [28] C. Wang, Y. Gonzalez, C. Shen, B. Hrycushko, and X. Jia*. "Simultaneous needle catheter selection and dwell time optimization for Preplanning of HDR Brachytherapy of Prostate Cancer", *Physics in Medicine* & Biology, (66), 055028, 2021.
- [29] **C. Wang**, M. Yan, and Y. Lou^{*}. "Accelerated schemes for the L_1/L_2 minimization." *IEEE Transaction on Signal Processing*, 68, 2660 2669, 2020.
- [30] **C. Wang**, Y. Gonzalez, C. Shen, and X. Jia* "Simultaneous needle selection and dwell time optimization in prostate cancer high-dose-rate brachytherapy." *Medical Physics* 47 (6), E367-E367, 2020.
- [31] Y. Huang, Y. Zhong, C. Wang, Y. Gonzalez, C. Shen, and X. Jia*. "Comprehensive calibration and evaluation of a cone-beam CT on a pre-clinical small animal radiation research platform", *Medical Physics* 47 (6), E731-E731, 2020.
- [32] Y. Rahimi, **C. Wang***, H. Dong, and Y. Lou. "A scale invariant approach for sparse signal recovery." *SIAM Journal on Scientific Computing*, 41(6), A3649–A3672, 2019.
- [33] **C. Wang***, G. Ballad, R.J. Plemmons, and S. Prasad "Joint 3D localization and classification of space debris using a multispectral rotating point spread function." *Applied Optics*, 58, 8598-8611, 2019.

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- [34] C. Wang*, R.H. Chan, M. Nikolova, R.J. Plemmons, and S. Prasad. "Non-convex optimization for 3dimensional point source localization using a rotating point spread function." SIAM Journal on Imaging Sciences, 12(1):259–286, 2019.
- [35] C. Wang*, R.J. Plemmons, S. Prasad, R.H. Chan, and M. Nikolova. "Novel sparse recovery algorithms for 3D debris localization using rotating point spread function imagery." In Proc. 2018 AMOS Technical Conference, Maui, HI. 2018.
- [36] **C. Wang***, R.H. Chan, R.J. Plemmons, and S. Prasad, "Point spread function engineering for 3D imaging using a continuous exact *L*₀ penalty (CEL0) based algorithm." *International Workshop on Image Processing and Inverse Problems*. 1-12, 2018.
- [37] X. Fang, F. Lin, and **C. Wang***. "Estimation of a regularization parameter for a robin inverse problem." *East Asian Journal on Applied Mathematics*, 7(2) 325-342, 2017.

Honors & Awards

•	Best Paper Awards	2022
	IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) workshop	
•	SIAM Early Career Travel Grant Award	2020
	2020 SIAM Conference on Imaging Science (IS20)	
•	SIAM Student Travel Grant Award	2018
	2018 SIAM Conference on Imaging Science (IS18)	
•	SIAM Student Chapter Certificate of Recognition	2018
•	Best Poster Presentation Award	2017
	4th AoE Symposium on Organelle Biogenesis and Function	
•	Best Student Paper Award	2017
	Annual Meeting of China Society for Industrial and Applied Mathematics	
•	CUHK Postgraduate Studentship	2015 - 2018
•	Second Prize of the National Post-Graduate Mathematic Contest in Modeling	2013
•	Outstanding Graduate Student Award at Shantou University	2013
•	Second Prize of the National Mathematics Contest. Guangdong Division (Rank 16th)	2011
•	National Endeavor Scholarship	2009 - 2010
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IE	aching	
So	uthern University of Science and Technology	Shenzhen, China
•	Instructor, Department of Statistics and Data Science	2022 – Present
	 STA201 Operational Research and Optimization, 2022- Present 	
	 STA5013 Statistical & Mathematical Image Processing, 2023- Present 	
Th	e Chinese University of Hong Kong	Hong Kong
•	Teaching Assistant, Department of Mathematics	2015 - 2018
	 MATH4230 Optimization Theory, Spring 2018 	
	 MATH3215A Operations Research, Fall 2017 	
	MATH2221 Mathematical Laboratory, Spring 2017	
	MATH3215 Operations Research, Spring 2017	
	 IVIA I DZULU AQVANCEO CAICULUS I, SPING ZULU MATH3210 Linear Programming Fall 2015 	
Sh	antou University	Shantou, China

• MAT1002B Linear Algebra and Analytic Geometry, Fall 2013

Professional Activities

Co-Editor

Special Issue: Multiple Sensors Fusion for Image Recognition Journal: Sensors

Referee Service

- SIAM Journal on Imaging Sciences
- Mathematical Programming
- **IEEE Transactions on Signal Processing**
- IEEE Transactions on Geoscience and Remote Sensing (TGRS)
- **Optics Express**
- **IEEE Internet of Things Journal**
- Inverse Problems and Imaging (IPI)
- TEST, Springer
- Journal of Mathematical Imaging and Vision
- Journal of Scientific Computing (JSC)
- Journal of Microscopy
- Machine Learning
- Research in the Mathematical Sciences (RMSB)
- Calcolo

Conference Organization

- CVPR •
- Infrared Physics and Technology
- Advances in Computational Mathematics
- •
- **Computational and Applied Mathematics** •
- **Computational Optimization and Applications** •
- Signal Processing •
- Journal of Computational and Applied Mathematics
- **Royal Society Open Science**
- IET Image Processing •
- Journal of Nonlinear and Variational Analysis
- International Journal of Digital Earth •
- •
- International Workshop on Image Processing and Machine Learning, Shenzhen Oct. 2025 Advanced Methods and Theories in High-dimensional Image Processing, Kunming (Tianyuan), Mar. 2025
- Statistics & Data Science Symposium between SUSTech and UIC, Shenzhen
- Min-symposium in International Congress on Industrial and Applied Mathematics, Tokyo Aug. 2023

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- Min-symposium in SIAM Conference on Imaging Science (IS22), online
- AI & Biomedical Imaging Workshop at UC Davis, online
- Mentorship (Ph.D. /MPhil /RA student project advisor)

PhD students:

- Ting Wang (SUSTech, Sept. 2022 Present) •
- Huiwen Zheng (SUSTech, May 2022 Jun. 2024)
- Rongmei Liang (SUSTech, start from Sept. 2025)

MPhil students:

- Yicheng Wu (SUSTech, Sept. 2024 Present)
- Zitian Ao (SUSTech, Sept. 2023 Present)
- Junjie Yu (SUSTech, Sept. 2021 Jun. 2023) RAs or visiting students:
- Zhenlin Luo (NUS, Aug. 2024 Present) •
- Rongkun Zhu (Xidian U, Jun. 2024 Jul. 2024) •
- Ruiwan Wen (Hainan U, Jun. 2024 Jul. 2024)
- Wang Ma (RPI, Jun. 2024 Jul. 2024)
- Shengjie Niu (HK PolyU, Jun. 2023 Jul. 2023) •

Aug. - Sep. 2018 & Jun. - Jul. 2017

Member of Shenzhen Health Economy Academy Health Statistic Committee	2021 - 2026
Student Chapter Representative	Jul. 2017

SIAM Chapter Meeting with SIAM Leadership at SIAM Annual Meeting in Pittsburgh, PA, USA

Research Exchange & Visiting

- **Research Associate**
 - Department of Computer Science Wake Forest University, USA

2023 - 2024

2019 - Present

Frontiers

- Geocarto International
- Nov. 2024
- Mar. 2022 Jan. - Mar. 2021
- 2018 Present
- Xiaotong Wu (SUSTech, Sept. 2022 Jun. 2024)



• Student Chapter of SIAM, The Chinese University of Hong Kong

Presentations

•	International Symposium on Image Computing and Digital Medicine (ISICDM 2024). Shenzhen	Dec. 2024
•	Invited Talk. Sun Yat-Sen University. Shenzhen.	Nov 2024
•	School-Conference on Tensor Methods in Mathematics and Data Science. Shenzhen	Nov. 2024
•	CSIAM Annual Meeting, Naniing	Oct. 2024
•	SIAM Annual Meeting (AN24), Spokane, US	Jul. 2024
•	SIAM Conference on Image Science (IS24). Atlanta, US	May 2024
•	Invited Talk, City University of Hong Kong, HK,	, Apr. 2024
•	Invited Talk, The Hong Kong Polytechnic University, HK	, Apr. 2024
•	Workshop on Data Science and Scientific Computing, HKBU	Dec. 2023
•	CSIAM Annual Meeting, Kunming	Oct. 2023
•	International Congress on Industrial and Applied Mathematics (ICIAM2023), Tokyo, Japan	Aug. 2023
•	Invited Talk, Jiangxi Normal University, Nanchang,	May 2023
•	Invited Talk, Nanchang Institute of Technology, Nanchang	May 2023
•	Invited Talk, International Conference on Image Processing and Artificial Intelligence, Online,	Dec. 2022
•	Invited Talk, International Conference on Frontier of Statistics & Data Science, SUSTech	Dec. 2022
•	Invited Talk, CSIAM Annual Meeting, online	Nov. 2022
•	Invited Talk, Nanjing University, online	Jun. 2022
•	AI for Medical Imaging Workshop, Zhejiang Normal University, online	May 2022
•	SIAM Conference on Image Science (IS22), online	Mar. 2022
•	Invited Talk, Shenzhen Institute of Advanced Technology, Chinese Academy of Science	Sept. 2021
•	Invited Talk, Frontiers in Biomedical Imaging Seminar Series, UCD BME, online	Nov. 2020
•	Invited Talk, Machine Learning Working Group, UCD Health, online	Oct. 2020
•	Invited Talk, Mathematics of Data and Decisions at Davis, UCD Math, online	Oct. 2020
•	Joint AAPM & COMP Virtual Meeting, online	Jul. 2020
•	SIAM Conference on Image Science (IS20), online	Jul. 2020
•	SIAM Conference on Computational Science and Engineering (CSE19), WA, USA	Feb. 2019
•	2019 Georgia Scientific Computing Symposium, Georgia Institute of Technology, GA, USA	Feb. 2019
•	Scientific Computing Seminar, Emory University, GA, USA	Feb. 2019
•	Advanced Maui Optical and Space (AMOS) Surveillance Technologies Conference, HI, USA	Sep. 2018
•	Invited Talk, Wake Forest University, NC, USA	Aug. 2018
•	Invited Talk, Shantou University, Shantou, China	Jul. 2018

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•	SIAM Conference on Image Science (IS18), Bologna, Italy	Jun. 2018
•	SIAM Conference on Applied Linear Algebra (ALA18), HKBU, HK	May 2018
•	International Workshop on Image Processing and Inverse Problems, CSRC, Beijing, China	Apr. 2018
•	4 th AoE Symposium on Organelle Biogenesis and Function, CUHK, Hong Kong	Dec. 2017
•	International Conf. & AoE Symposium on Organelle Biogenesis and Function, CUHK, HK	Sep. 2017
•	15 th Annual Meeting of China SIAM, Qingdao, China	Oct. 2017
•	2017 Imaging Science Camp at SUST, Shenzhen, China	Mar. 2017
•	East Asian Section of SIAM Conference (EASIAM), Macau	Jun. 2016
•	2014 Imaging Science Camp at SYSU, Guangzhou, China	May 2014

Skills

Programming:

• MATLAB (Proficient), Python (Competent), Mathematica (Competent), C/C++ (Competent)

Software/API:

• TensorFlow, Keras, MS Office, LaTeX

Language:

• English (Fluent), Cantonese Chinese (Native), Mandarin Chinese (Fluent), Teochew Chinese (Native)

Last updated on 2025-5-27