

# Weilin Li

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## Contact Information

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## Research Interests

Applied analysis, data science, machine learning, and signal processing

## Employment

**City University of New York, City College**

*Assistant Professor (tenure-track)*

2022–

**New York University**

*Visiting Assistant Professor*

2021–22

*Courant Instructor*

2018–21

## Education

**University of Maryland, College Park**

2018

*Ph.D. Mathematics*

*Thesis:* Topics in Harmonic Analysis, Sparse Representations, and Data Analysis

*Advisors:* John J. Benedetto and Wojciech Czaja

**Cornell University**

2013

*B.A. Mathematics, Summa Cum Laude*

*Thesis:* Boundary value problems on a half-Sierpinski Gasket

*Advisor:* Robert S. Strichartz

## Awards, Fellowships, and Grants

- NSF-DMS Award #2309602, sole PI 2023–
- PSC-CUNY Traditional B Grant 2023
- Charles Chui Young Researcher Best Paper Award 2021
- AMS–Simons Travel Grant 2019–22
- Cohen Foundation research support, New York University 2018–19
- James C. Alexander Prize for Graduate Research, University of Maryland 2018
- Ann G. Wylie Dissertation Fellowship, University of Maryland 2017
- Program Associate, Mathematical Sciences Research Institute, Berkeley 2017
- Dean’s Fellowship, University of Maryland 2013–15

## Preprints

1. C. Sinan Güntürk and Weilin Li. Approximation of functions with one-bit neural networks. [\[arXiv\]](#)

## Publications

1. C. Sinan Güntürk and Weilin Li. Approximation with one-bit polynomials in Bernstein form. *Constructive Approximation (special issue for Ron DeVore's 80th birthday)*, to appear. [\[arXiv\]](#)
2. C. Sinan Güntürk and Weilin Li. Quantization for spectral super-resolution. *Constructive Approximation*, to appear. [\[journal\]](#)
3. Weilin Li, Kui Ren, and Donsub Rim. A range characterization of the single-quadrant ADRT. *Mathematics of Computation*, vol. 92, no. 339, pp. 283–306, 2023. [\[journal\]](#)
4. Weilin Li, Zengying Zhu, Weiguo Gao, and Wenjing Liao. Stability and super-resolution of MUSIC and ESPRIT for multi-snapshot spectral estimation. *IEEE Transactions on Signal Processing*, vol. 70, pp. 4555–4570, 2022. [\[journal\]](#)
5. Wojciech Czaja, Ilya Kavalero, and Weilin Li. Exploring the high dimensional geometry of HSI features. *11th Workshop on Hyperspectral Imaging and Signal Processing: Evolution in Remote Sensing (WHISPERS)*, pp. 1–5, 2021. [\[proceedings\]](#)
6. Wojciech Czaja, Weilin Li, Yiran Li, and Mike Pekala. Maximal function pooling with applications. *Excursions in Harmonic Analysis, Volume 6 (In honor of John Benedetto's 80th birthday)*, pp. 413–429, 2021. [\[book chapter\]](#).
7. Weilin Li. Generalization error of minimum weighted norm and kernel interpolation. *SIAM Journal on Mathematics of Data Science*, vol. 3, no. 1, pp. 414–438, 2021. [\[journal\]](#)
8. Weilin Li, Wenjing Liao, and Albert Fannjiang. Super-resolution limit of the ESPRIT algorithm. *IEEE Transactions on Information Theory*, vol. 66, no. 7, pp. 4593–4608, 2020. [\[journal\]](#)
9. Weilin Li and Wenjing Liao. Conditioning of restricted Fourier matrices and super-resolution of MUSIC. *13th International Conference on Sampling Theory and Applications (SampTA)*, 2019. [\[proceedings\]](#)
10. C. Sinan Güntürk and Weilin Li. High performance quantization for spectral super-resolution. *13th International Conference on Sampling Theory and Applications (SampTA)*, 2019. [\[proceedings\]](#)
11. Ilya Kavalero, Weilin Li, Wojciech Czaja, and Rama Chellappa. 3-D Fourier scattering transform and classification of hyperspectral images. *IEEE Transactions on Geoscience and Remote Sensing*, vol. 59, no. 12, pp. 10312–10327, 2021. [\[journal\]](#)
12. Wojciech Czaja, Ilya Kavalero and Weilin Li. Scattering transforms and classification of hyperspectral images. *SPIE, Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery*, XXIV, 2018. [\[proceedings\]](#)
13. John Peterson, Weilin Li, Brian Cesar-Tondreau, John Bird, Kevin Kochersberger, Wojciech Czaja, and Morgan McLean. Experiments in unmanned aerial vehicle/unmanned ground vehicle radiation search. *Journal of Field Robotics*, vol. 36, no. 4, pp. 818–845, 2019. [\[journal\]](#)
14. Kevin Kochersberger, John Peterson, Prashant Kumar, John Bird, Morgan McLean, Wojciech Czaja, Weilin Li, and Nathaniel Monson. Unmanned aircraft applications in radiological surveys. *IEEE International Symposium on Technologies for Homeland Security*, 2018. [\[proceedings\]](#)
15. Weilin Li and Wenjing Liao. Stable super-resolution limit and smallest singular value of restricted Fourier matrices. *Applied and Computational Harmonic Analysis*, vol. 51, no. 1, pp. 118–156, 2021. [\[journal\]](#)
16. Wojciech Czaja and Weilin Li. Rotationally invariant time-frequency scattering transforms. *Journal of Fourier Analysis and Applications*, vol. 26, no. 1, pp. 1–23, 2020. [\[journal\]](#)
17. Wojciech Czaja and Weilin Li. Analysis of time-frequency scattering transforms. *Applied and Computational Harmonic Analysis*, vol. 47, no. 1, pp. 149–171, 2019. [\[journal\]](#)

18. John J. Benedetto and Weilin Li. Super-resolution by means of Beurling minimal extrapolation. *Applied and Computational Harmonic Analysis*, vol. 48, no. 1, pp. 218–241, 2020. [\[journal\]](#)
19. Weilin Li and Robert S. Strichartz. Boundary value problems on a half Sierpinski gasket. *Journal of Fractal Geometry*, vol. 1, no. 1, pp. 1–43, 2014. [\[journal\]](#)

## Seminar and Conference Talks

- 11th Applied Inverse Problems Conference, Göttingen, Germany 2023
- 17th US National Congress on Computational Mechanics, Albuquerque, New Mexico 2023
- Workshop on Mathematical Signal and Image Analysis, Raitenhaslach, Germany 2023
- Machine Learning Seminar, University of Massachusetts at Amherst 2023
- Applied Math Colloquium, Columbia University 2022
- Fall Fourier Talks, University of Maryland, College Park 2022
- Focus Program on Data Science, Approximation Theory, and Harmonic Analysis, Toronto 2022
- Harmonic Analysis and PDE Seminar, Graduate Center of CUNY (online) 2022
- AMS Special Session, Joint Math Meetings, Seattle (online) 2022
- Minisymposium, SIAM Conference on Imaging Science, Berlin (online) 2022
- Faraway Fourier Talks (online) 2021
- Applied/PDE/Data Seminar, University of California, Santa Barbra (online) 2021
- 1W-MINDS: One World Mathematics of INformation, Data, and Signals (online) 2021
- Scientific Computing And Numerics, Cornell University (online) 2021
- Computational and Applied Math Seminar, Tufts University 2021
- 11th WHISPERS, Amsterdam (online) 2021
- Computational Analysis Seminar, Vanderbilt University (online) 2021
- Workshop on Mathematical Signal and Image Analysis, Raitenhaslach (canceled) 2020
- Randomness and Determinism in Compressive Data Acquisition, Texas A&M 2019
- Seminar in Mathematical Physics/PDE, University of California, San Diego 2019
- Applied and Computational Math Seminar, University of California, Irvine 2019
- Norbert Wiener Center Seminar, University of Maryland, College Park 2019
- Analysis Seminar, Courant Institute of Mathematical Sciences 2019
- AMS Fall Western Sectional Meeting, San Francisco State University 2018
- 7th International Conference on Computational Harmonic Analysis, Vanderbilt 2018
- Norbert Wiener Center Seminar, University of Maryland, College Park 2018
- Applied Math and Analysis Seminar, Duke University 2018
- Harmonic Analysis and Signal Processing Seminar, Courant Institute 2017
- Applied and Computational Mathematics Seminar, Georgia Institute of Technology 2017
- AMS Sectional Meeting, University of Florida, Orlando 2017
- Norbert Wiener Center Seminar, University of Maryland, College Park 2017
- Graduate Student Seminar, Mathematical Sciences Research Institute, Berkeley 2017
- Research Interaction Team on Deep Learning, University of Maryland, College Park 2016
- AMS Special Session, Joint Mathematics Meetings, Baltimore 2014
- AMS Session, Joint Mathematics Meetings, San Diego 2013