Howard W. Levinson

CONTACT INFORMATION

Address:	Department of Computer Science
	Oberlin College
	10 North Professor Street, Oberlin, OH 44074
Email:	hlevinso@oberlin.edu
Website:	`cs.oberlin.edu/~hlevinso`

RESEARCH INTERESTS

Inverse problems in imaging and its applications. Nonlinear scattering, compressive imaging, and computational methods.

ACADEMIC POSITIONS

Assistant Professor (tenure-track)
Department of Computer Science, Oberlin College
September 2023-present

Assistant Professor (tenure-track)
Department of Mathematics and Computer Science, Santa Clara University
September 2019-August 2023

James Van Loo Post-Doctoral Fellow and Assistant Professor
Department of Mathematics, University of Michigan
August 2016-August 2019.

EDUCATION

UNIVERSITY OF PENNSYLVANIA   MAY 2016

Ph.D. in Applied Mathematics and Computational Science

Thesis Title: *"A novel algorithm for solving nonlinear inverse scattering problems"*
Thesis Advisor: Vadim A. Markel

TUFTS UNIVERSITY   MAY 2011

B.A. in Mathematics, *summa cum laude with highest honors*

Senior Thesis Title: *"Reconstruction algorithms for bistatic radar and ultrasound imaging"*
Thesis Advisor: E. Todd Quinto

PUBLICATIONS

1. H. W. Levinson, V. A. Markel, N. Triantafillou, "Inversion of Band-Limited Discrete Fourier Transforms of Binary Images: Uniqueness and Algorithms", *SIAM J. on Imaging Sciences*, 16(3), 1338-1369, (2023).

2. J. S. Donato, H. W. Levinson, "Structured iterative hard thresholding with on- and off-grid applications", *Linear Algebra and its Applications* 638, 46-79, (2022).

3. H. W. Levinson, V.A. Markel, "Binary discrete Fourier transform and its inversion", *IEEE Transactions on Signal Processing*, 69, 3484-3499, (2021).

4. A. C. Gilbert, H. W. Levinson, J. C. Schotland, "Nonlinear iterative hard thresholding for inverse scattering", *SIAM J. on Imaging Sciences*, 13(1), 108-140, (2020).

5. V. A. Markel, H. W. Levinson, J. C. Schotland, "Fast linear inversion for highly overdetermined inverse scattering problems", *Inverse Problems*, 35(12), (2019).

6. A. C. Gilbert, H. W. Levinson, J. C. Schotland, "Imaging from the inside out: inverse scattering with photoactivated internal sources", *Optics Letters*, 43(12), 3005-3008, (2018).

7. H. W. Levinson, V. A. Markel, "Solution of the inverse scattering problem by T-matrix completion. II. Simulations", *Physical Review E* 94(4), 043318, (2016).

8. H. W. Levinson, V. A. Markel, "Solution of the inverse scattering problem by T-matrix completion. II. Theory", *Physical Review E* 94(4), 043317, (2016).

9. V. Krishnan, H. W. Levinson, E. T. Quinto, "Microlocal analysis of elliptical Radon transforms with foci on a line", *The Mathematical Legacy of Leon Ehrenpreis*, Springer Proceedings in Mathematics, 16(2012), 163-182

HONORS AND AWARDS

- Summer Research Stipend Award, Santa Clara University, 2021

- The B. Alan Taylor Award "for Excellence in Teaching, Mentoring, and Research", University of Michigan, 2018

- The Moez Alimohamed Graduate Student Award for Distinguished Teaching in Mathematics, University of Pennsylvania, 2016

- Dissertation Completion Fellowship, University of Pennsylvania, 2015-2016

- Benjamin Franklin Fellowship, University of Pennsylvania, 2012-2015

- Math Departmental Good Teaching Awards, University of Pennsylvania, Fall 2013 and Spring 2014

- Class of 1942 Prize Scholarship, Tufts University, 2011

TEACHING EXPERIENCE

<u>Santa Clara University</u>   (X.X/5.0: Student Evaluation)

Instructor

Fall 2022	Math 166 : Numerical Analysis	(4.76/5.0)
Fall 2022	Math 12H : Calculus II (Honors)	(4.80/5.0)
Spring 2022	Math 144 : Partial Differential Equations	(4.71/5.0)
Spring 2022	Math 31 : Calculus for Business II	(4.83/5.0)
Winter 2022	Math 36 : Calculus for Life Sciences II	(4.40/5.0)
Fall 2021	Math 12H : Calculus II (Honors)	(5.0/5.0)
Fall 2021	Math 11 : Calculus and Analytic Geometry I	(4.50/5.0)
Spring 2021	Math 155 : Ordinary Differential Equations	(4.85/5.0)
Spring 2021	Math 30 : Calculus for Business I	(4.65/5.0)
Winter 2021	Math 166 : Numerical Analysis	(4.92/5.0)
Winter 2021	Math 12 : Calculus and Analytic Geometry II	(4.45/5.0)
Spring 2020	Math 36 : Calculus for Life Sciences II	(5.0/5.0)
Spring 2020	Math 12 : Calculus and Analytic Geometry II	(4.52/5.0)
Winter 2020	Math 166 : Numerical Analysis	(4.88/5.0)
Winter 2020	Math 36 : Calculus for Life Sciences II	(4.22/5.0)
Fall 2019	Math 51 : Discrete Mathematics	(4.67/5.0)

<u>University of Michigan</u>   (X.X/5.0: Student Evaluation)

Instructor

Spring 2019	Math 214 : Applied Linear Algebra	(5.0/5.0)
Winter 2019	Math 450 : Advanced Math for Engineers	(4.96/5.0)
Winter 2018	Math 471 : Intro to Numerical Methods	(4.94/5.0)
Fall 2017	Math 214 : Applied Linear Algebra	(4.92/5.0)
Winter 2017	Math 217 : Linear Algebra	(4.90/5.0)
Fall 2016	Math 215 : Caluclus III	(4.69/5.0)

<u>University of Pennsylvania</u>   (X.X/4.0: Student Evaluation)

Instructor

Summer 2016	Math 104 : Calculus I	(3.66/4.0)
Summer 2014	Math 104 : Calculus I	(3.87/4.0)

UNDERGRADUATE RESEARCH MENTORING

- Emma Riley Fink, Summer 2021, Santa Clara University.

- Nikolaus Elsaesser, Summer 2021, Santa Clara University.

- Jun Hyun Lim, Summer 2021, Santa Clara University.

- Stephen Gibson, Summer 2021, Santa Clara University.

- Austin Rothschild, Summer 2020, Santa Clara University.

- Pranav Rao, Summer 2020, Santa Clara University.

- Joseph Donato, Summer 2019 and 2020, University of Michigan. Resulted in a publication.

INVITED TALKS

- SIAM Conference on Imaging Sciences, Virtual, March 2022

- Mathematics Seminar, Carnegie Mellon University, Pittsburgh, PA, February 2022

- Mathematics and Computer Science Colloquium, Duquesne University, Pittsburgh, PA, February 2022

- SIAM Conference on Imaging Sciences, Toronto, Canada, July 2020

- International Council for Industrial and Applied Mathematics Conference, Valencia, Spain, July 2019

- Applied Inverse Problems Conference, Grenoble, France, July 2019

- Applied and Interdisciplinary Mathematics Seminar, University of Michigan, Ann Arbor, MI, March 2019

- Mathematics Colloquium, University of South Florida, Tampa, FL, January 2019

- AMS Fall Central Sectional Meeting, Ann Arbor, MI, October 2018

- SIAM Annual Meeting, Portland, OR, July 2018

- Inverse Problems: Modeling and Simulation Conference, Mellieha, Malta, May 2018

- Mathematics Colloquium, Tufts University, Medford, MA, October 2017

- Computational Mathematics, Science and Engineering Seminar, Michigan State University, East Lansing, MI, October 2017

- Applied and Interdisciplinary Mathematics Seminar (student), University of Michigan, Ann Arbor, MI, September 2017

- Applied Inverse Problems Conference, Hangzhou, China, May 2017

- Imaging and Applied Optics Congress, Heidelberg, Germany, July 2016

- SIAM Student Conference, University of Pennsylvania, Philadelphia, PA, April 2015

- Biomedical Optics Topical Meeting, Miami, FL, April 2014

UNDERGRADUATE AND OUTREACH TALKS

- "Math and Microscopes", University of San Francisco, San Francisco, CA, February 2020

- "Seeing Clearly Through a Microscope", Scripps College, Claremont, CA, March 2019

- "Seeing the World Unfiltered", Gonzaga University, Spokane, WA, February 2019

SCIENTIFIC RESEARCH EXPERIENCE

University of Pittsburgh   MAY 2011- AUGUST 2012
Geriatric Psychiatry Neuroimaging Lab
Advisor: Howard Aizenstein

SERVICE AND PROFESSIONAL DEVELOPMENT

- OUTREACH
  - Served on San Jose Math Circle Committee, 2022-2023.
  - Administered exam and organized award ceremony for Bay Area Mathematical Olympiad for 4th-12th graders, 2021-2023.
  - Organizer of SCU High School Math Festival, 2021-2023.
  - Served as panelist at REU for underrepresented students at Tufts University, June 2021.
  - Served as judge at SCU Hack for Humanity hackathon, February 2020.

- DEPARTMENT AND UNIVERSITY SERVICE
  - SCU Mathematics and Computer Science Colloquium Chair, 2022-2023.
  - Served on college Undergraduate Research Opportunities (SAURO) Review Committee, 2022-2023.
  - Served on departmental Canessa Event Committee, 2022-2023.
  - Junior Faculty Advisor, 2021-2022.
  - Served on Search Committee to hire Professor of Practice for High Performance Computing, 2021.
  - Nominator for student memberships to the American Mathematical Society, 2020-2023.
  - Served as panelist at Computer Science and Math Major/Minor meeting at SCU, 2020-present.
  - Computer Science and Mathematics major advising.

- PROFESSIONAL SERVICE
  - Organizer of mini-symposium at the International Congress on Industrial and Applied Mathematics, July 2019
  - Organizer of mini-symposium at Applied Inverse Problems Conference, July 2019
  - Referee for IEEE Transactions on Signal Processing
  - Referee for Journal of Applied Mathematics and Computing
  - Referee for Journal of Mathematical Biosciences and Engineering
  - Referee for SIAM Journal of Scientific Computing

- Referee for SIAM Undergraduate Research Online Journal

- Organizer for Sparsity Seminar at University of Michigan, 2016-2017

- Member SIAM

- Secretary for University of Pennsylvania SIAM Student Chapter, 2014-2016