

Tadanaga Takahashi (He/Him)

CURRICULUM VITAE

Postdoctoral Fellow, University of New Mexico

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Academic Appointments

2024–Present	Postdoctoral Fellow , Dept. of Mathematics & Statistics, UNM
2023	Adjunct Professor , Dept. of Mathematical Sciences, NJIT
2019–2023	Graduate Research Assistant , Dept. of Mathematical Sciences, NJIT
2017–2019	Graduate Teaching Assistant , Dept. of Mathematical Sciences, NJIT
2016–2017	Undergraduate Research Assistant , Dept. of Mathematical Sciences, NJIT

Education

New Jersey Institute of Technology

PHD IN MATHEMATICAL SCIENCES

- Advisor: Dr. Yassine Boubendir
- Co-Advisor: Dr. Brittany Hamfeldt
- Dissertation Title: Domain Decomposition Methods for Linear and Nonlinear Elliptic Equations

Newark, NJ

Sept. 2017 - May 2023

New Jersey Institute of Technology

BS IN MATHEMATICAL SCIENCE

- Dual focus in Applied and Computational Mathematics

Newark, NJ

Sept. 2014 - May 2017

Teaching Experience

UNIVERSITY OF NEW MEXICO

Fall 2026	Applied Ordinary Differential Equations (MATH 316), Introduction to Numerical Computing (MATH 375) , Instructor	UNM
Spring 2026	Applied Ordinary Differential Equations (MATH 316), Introduction to Numerical Computing (MATH 375) , Instructor	UNM
Fall 2025	Applied Ordinary Differential Equations (MATH 316), Introduction to Numerical Computing (MATH 375) , Instructor	UNM
Spring 2025	Calculus III (MATH 2531), Introduction to Numerical Computing (MATH 375) , Instructor	UNM
Fall 2024	Calculus III (MATH 2531), Introduction to Numerical Computing (MATH 375) , Instructor	UNM
Spring 2024	Calculus III (MATH 2531), Introduction to Numerical Computing (MATH 375) , Instructor	UNM

NEW JERSEY INSTITUTE OF TECHNOLOGY

Fall 2023	Calculus I (MATH 111) , Instructor	NJIT
Spring 2020	Precalculus (MATH 110), Calculus (MATH 111) , Teaching Assistant	NJIT
Fall 2019	Numerical Methods (MATH 340) , Teaching Assistant	NJIT
Spring 2019	Calculus II (MATH 112), MATLAB Helpdesk , Teaching Assistant, Tutor	NJIT
Fall 2018	Teaching Mathematics (MATH 599) , Teaching Assistant	NJIT
Spring 2018	Calculus I (MATH 111), MATLAB Helpdesk , Teaching Assistant, Tutor	NJIT
Fall 2017	Calculus I (MATH 111), MATLAB Helpdesk , Teaching Assistant, Tutor	NJIT

Publications

PUBLISHED

2024. Yassine Boubendir, Jake Brusca, Brittany F. Hamfeldt, and Tadanaga Takahashi. Domain Decomposition Methods for the Monge–Ampère Equation. *SIAM Journal on Numerical Analysis*, 62(4), 1979–2003. doi:10.1137/23M1576839.
2022. (with Yassine Boubendir). Non-Overlapping Domain Decomposition Methods with Cross-Points and Padé Approximants for the Helmholtz Equation. In: *Domain Decomposition Methods in Science and Engineering XXVI*. Ed. by Susanne

2018. (with Abram Clark, Trush Majmudar, and Lou Kondic). Granular Response to Impact: Topology of the Force Networks. Physical Review E 97.1

IN PREPARATION

2026. (with Yassine Boubendir). Non-overlapping Domain Decomposition Method with Continuity Extension of Crosspoints

Presentations

CONTRIBUTED PRESENTATIONS 2023. (with Yassine Boubendir). Domain Decomposition Methods for Nonhomogeneous Scattering Simulations. Poster presentation at Frontiers in Applied & Computational Mathematics. NJIT, Newark, NJ.

2020. (with Yassine Boubendir). Non-overlapping Domain Decomposition Methods with Cross-Points and Padé Approximants for the Helmholtz Equation. Proceeding for 26th International Domain Decomposition Conference. Hong Kong, China.

2019. Non-overlapping Domain Decomposition Methods for Scattering Problems. Poster presentation at Dana Knox Student Showcase. NJIT, Newark, NJ.

2017. Analyzing Force Networks in Granular Systems using Persistent Homology. Poster presentation at Frontiers in Applied & Computational Mathematics. NJIT, Newark, NJ.

2016. (with Diego Rios, Alina Mohit-Tabatabai). Applications of the Kalman Filter for Modeling Eddy Currents. Poster presentation at IEEE URTC Conference at MIT, Cambridge, MA.

Awards, Fellowships, & Grants

2019-2020 **Ahluwalia Doctoral OAF Fellowship**, NJIT

2018-2019 **Provost Doctoral Award**, NJIT

2017-2018 **Provost Doctoral Award**, NJIT

2016-2017 **Ahluwalia Scholarship for Applied Mathematics**, NJIT

2016-2017 **Thomas Maniscalco Annual Scholarship**, NJIT

2015-2017 **Ahluwalia Scholarship for Applied Mathematics**, NJIT

2014-2017 **NJ STARS**, NJHESSA

Research Projects

Nonlinear Additive Schwarz for the Monge-Ampère Equation

CO-ADVISORS: DR. YASSINE BOUBENDIR, DR. BRITTANY HAMFELDT

*NJIT
2020 - 2023*

- Model: Monge-Ampère
- Methods: Wide stencil, Newton-Raphson, Domain Decomposition
- Goal: Study convergence of domain decomposition for a fully-nonlinear problem

Crosspoint Algorithm for Nodal Finite Elements DDM with DtN-based Transmission Operators

ADVISOR: DR. YASSINE BOUBENDIR

*NJIT
2019-2023*

- Model: Nonhomogeneous Helmholtz
- Methods: Finite Element, Boundary Element, Domain Decomposition
- Goal: Develop efficient algorithms for wave scattering simulations for mid to high frequencies

Analyzing Force Networks in Granular Systems using Persistent Homology

ADVISOR: DR. LOU KONDIC

*NJIT
2016-2018*

- Model: Network-based Granular model
- Methods: Persistent homology
- Goal: Analyze the force propagation during impact using computational topology tools

Applications of the Kalman Filter for Modeling Eddy Currents

NJIT
2015-2016

SUPERVISOR: DR. RICHARD MOORE

- Model: Linear stochastic differential equation
- Methods: Kalman Filter
- Goal: Simulate data assimilation problem to predict parameterized system using various observer configuration