JIAN ZHAI

Associate Professor (tenure track), School of Mathematical Sciences, Fudan University
2016 Guanghua East Tower, 220 Handan Road, Shanghai 200433, China
jianzhai@fudan.edu.cn http://jianzhai.github.io

EMPLOYMENT

Associate Professor (tenure track), School of Mathematical Sciences, **Fudan University**, Sep. 2021 - Now.

Postdoctoral Fellow, Institute for Advanced Study, **The Hong Kong University of Science and Technology**, Mar. 2019 - Sep. 2021.

Visiting Lecturer, Department of Mathematics, **University of Washington**, Sep. 2018 - Mar. 2019.

Postdoctoral Fellow, Department of Computational and Applied Mathematics, **Rice University**, July 2018 - Aug. 2018.

EDUCATION

Rice University May 2018
Ph.D. in Computational and Applied Mathematics
Advisor: Prof. Maarten V. de Hoop

Purdue University Aug. 2013 - Aug. 2015
Graduate program in Mathematics
Advisor: Prof. Maarten V. de Hoop

Fudan University Jun. 2013
M. S. in Mathematics
Advisors: Prof. Jin Cheng

Sichuan University Jun. 2010
B. S. in Mathematics

RESEARCH INTERESTS

- Inverse Problems, Ill-posed Problems
- Partial Differential Equations
- Microlocal Analysis
- Spectral theory
- Scientific Computing

PUBLICATIONS

- (with S. Acosta and G. Uhlmann) Nonlinear ultrasound imaging modeled by a Westervelt equation, *SIAM J. Appl. Math.*, to appear
- (with P. Hintz and G. Uhlmann) The Dirichlet-to-Neumann map for a semilinear wave equation on Lorentzian manifolds, *preprint*, arXiv:2103.08110.

- (with G. Bao and X. Xu) Inverse spectral problem for a damped wave operator, *SIAM J. Appl. Math.*, **81** (2021) 1799-1820.
- (with P. Li and Y. Zhao) Lipschitz stability for an inverse source scattering problem at a fixed frequency, preprint, *Inverse Problems*, **37** (2021) 025003.
- (with P. Hintz and G. Uhlmann) An inverse boundary value problem for a semilinear wave equation on Lorentzian manifolds, *Int. Math. Res. Not.*, to appear.
- (with G. Uhlmann) Inverse problems for nonlinear hyperbolic equations, *Discrete Contin. Dyn. Syst.*, **41** (2021) 455-469.
- (with P. Li and Y. Zhao) Stability for the acoustic inverse source problem in inhomogeneous media, *SIAM J. Appl. Math.*, **80** (2020) 2547-2559.
- (with G. Uhlmann) On an inverse boundary value problem for a nonlinear elastic wave equation, *J. Math. Pures Appl.*, **153** (2021) 114-136.
- (with M. V. de Hoop, T. Saksala and G. Uhlmann) Generic uniqueness and stability for the mixed ray transform, *Trans. Amer. Math. Soc.*, **374** (2021) 6085-6144.
- (with M. V. de Hoop, A. Iantchcenko and R. D. van der Hilst) Semiclassical inverse spectral problem for seismic surface waves in isotropic media II: Rayleigh waves, *Inverse Problems*, **36** (2020) 075016.
- (with M. V. de Hoop, A. Iantchcenko and R. D. van der Hilst) Semiclassical inverse spectral problem for seismic surface waves in isotropic media I: Love waves, *Inverse Problems*, **36** (2020) 075015.
- (with X. Xu) Inversion of trace formulas for a Sturm-Liouville operator, *J. Comput. Math.*, to appear.
- (with M. V. de Hoop and G. Nakamura) Unique recovery of piecewise analytic density and stiffness tensor from the elastic-wave Dirichlet-to-Neumann map, *SIAM J. Appl. Math.*, **79** (2019) 2359-2384.
- (with M. V. de Hoop and G. Uhlmann) Inverting the local geodesic ray transform of higher rank tensors, *Inverse Problems*, **35** (2019) 115009.
- (with Y. Yang) Unique determination of a transversely isotropic perturbation in a linearized inverse boundary value problem for elasticity, *Inverse Probl. Imaging*, **13** (2019) 1309-1325.
- (with M. V. de Hoop and T. Saksala) Mixed ray transform on simple 2-dimensional Riemannian manifolds, *Proc. Amer. Math. Soc.*, **147** (2019) 4901-4913.
- (with M. V. de Hoop, A. Iantchenko, G. Nakamura) Semiclassical analysis of elastic surface waves, *preprint*, arXiv:1709.06521.
- (with M. V. de Hoop and G. Nakamura) Reconstruction of Lamé moduli and density at the boundary enabling directional elastic wavefield decomposition, *SIAM J. Appl. Math.*, **77** (2017) 520-536.
- (with E. Beretta, M. V. de Hoop, E. Francini and S. Vessella) Uniqueness and Lipschitz stability of an inverse boundary value problem for time-harmonic elastic waves, *Inverse Problems*, **33** (2017) 035013.

TEACHING

- Calculus II (MATH 1014), Instructor, HKUST, Spring 2020.

- Introduction to Differential Equations (MATH 307), Instructor, University of Washington, Winter 2019.
- Numerical analysis I (CAAM 453), Teaching Assistant, Rice University, Fall 2017.

AWARDS

- **Alan Weiser Memorial Travel Awards**, Rice University, CAAM May 2017

PRESENTATIONS

- Joint Fudan-RICAM Seminar on Inverse Problems, online Dec. 2020
- Seminar, Northeast Normal University, online Oct. 2020
- Seminar, Southern University of Science and Technology, online Jun. 2020
- Minisymposium on Recent Advances in Geometric Inverse Problems, Applied Inverse Problems Conference, Grenoble, France July 2019
- Minisymposium on Inverse Problems in Elastic Medium, Applied Inverse Problems Conference, Grenoble, France July 2019
- Seminar, Zhejiang University, Hangzhou, China Jun. 2019
- The 11th Conference on Inverse Problems, Imaging and Applications, Lanzhou, China Jun. 2019
- The 5th East Asia Section of IPIA Young Scholars Symposium, Beijing, China Jun. 2019
- Seminar, Hong Kong University of Science and Technology, Hong Kong, China May. 2019
- Canadian Mathematical Society Winter Meeting, Vacouver, Canada Dec. 2018
- Differential Geometry and PDE Seminar, University of Washington, Seattle, WA, USA Oct. 2018
- International Workshop on Inverse Problems for PDEs, Nanjing, China Sep. 2018
- SIAM Annual Meeting, Portland, OR, USA July 2018
- Seminar, Zhejiang University, Hangzhou, China Jun. 2017
- Applied Inverse Problem Conference, Hangzhou, China Jun. 2017
- Graduate Seminar, Rice University, Houston, TX, USA Feb. 2017
- IAS Workshop on Inverse Problems, Imaging and PDEs, HKUST, Hong Kong, China Dec. 2016
- Seminar, Fudan University, Shanghai, China May 2016
- Graduate Seminar, Rice University, Houston, TX, USA Nov. 2015

PROGRAMMING SKILLS

C/C++, Matlab