January 21, 2025

RYOSUKE SHIMIZU

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Education

Ph.D. in Informatics, Kyoto University. (Supervisor: Jun Kigami) Apr. 2020—Sep. 2022
MInf, Kyoto University. (Supervisor: Jun Kigami) Apr. 2018—Mar. 2020
B.Sc., Faculty of Science, Kyoto University. Apr. 2014—Mar. 2018

Employment

Junior Researcher (Assistant Professor) · JSPS Research Fellow PD, Waseda University Oct. 2023—Present

Fellowship

JSPS Research Fellow (PD) for Young Scientists, Waseda University Apr. 2023—Present
JSPS Research Fellow (PD) for Young Scientists[*], Kyoto University Sep. 2022—Mar. 2023
JSPS Research Fellow (DC1) for Young Scientists, Kyoto University April 2020—Sep. 2022

Awards

MSJ Takebe Katahiro Prize for Encouragement of Young Researchers 2024

Publications and Preprints

• *Characterizations of Sobolev functions via Besov-type energy functionals in fractals*, preprint (2024); submitted.

• (with Takashi Kumagai and Nageswari Shanmugalingam) *Finite dimensionality of Besov spaces and potential-theoretic decomposition of metric spaces*, preprint (2024); submitted.

• (with Naotaka Kajino) *Korevaar–Schoen p-energy form and associated p-energy measures on fractals*, Springer Tohoku Series in Mathematics (to appear).

• (with Naotaka Kajino) *Contraction properties and differentiability of p-energy forms with applications to nonlinear potential theory on self-similar sets*, preprint (2024); submitted.

• (with Naotaka Kajino) *p-Energy forms on fractals: recent progress*, preprint (2023); submitted.

• (with Mathav Murugan) *First-order Sobolev spaces, self-similar energies and energy measures on the Sierpiński carpet*, Comm. Pure Appl. Math. (to appear).

• *Construction of p-energy and associated energy measures on Sierpiński carpets*, Trans. Amer. Math. Soc. **377** (2024), no.2, 951–1032.

• *Parabolic index of an infinite graph and Ahlfors regular conformal dimension of a self-similar set*, in **Analysis and Partial Differential Equations on Manifolds, Fractals and Graphs**, edited by Alexander Grigor'yan and Yuhua Sun, Berlin, Boston: De Gruyter, 2021, pp. 201–274.

[*]The category was changed from (DC1) because I obtained the doctral degree.

Selected Talks

• *On singularity of p-energy measures among distinct values of p for some p.-c.f. self-similar sets*, Geometric Analysis Seminar, University of Jyväskylä, Jyväskylä, Finland, September 30, 2024.
• *Construction of self-similar energy forms and self-similar energy measures on the Sierpinski carpet* (contributed talk), Fractal Geometry and Stochastics 7, Technical University of Chemnitz, Chemnitz (Saxony), Germany, September 23, 2024.
• *Construction of Korevaar–Schoen p-energy forms and associated p-energy measures* (short presentation), Recent Developments in Dirichlet Form Theory and Related Fields, Oberwolfach, Germany, September 17, 2024.
• *First-order Sobolev spaces and self-similar energies on the Sierpinski carpet*, Geometric Analysis Seminar, University of Jyväskylä, Jyväskylä, Finland, March 11, 2024.
• *Construction of first-order Sobolev spaces on the planar Sierpiński carpet* (short talk), Random Interacting Systems, Scaling Limits, and Universality (Week 1), National University of Singapore, Singapore, Singapore, December 6, 2023.
• *Construction of a canonical p-energy on the Sierpiński carpet for all* $p > 1$, Geometric and Stochastic analysis on metric spaces, Kyoto University, Kyoto, Japan, March 13, 2023.

• *Nonlinear potential theory on the Sierpiński carpet* (25 minutes talk), Analysis and geometry of fractals and metric spaces: Recent developments and future prospects, Bankoku Shinryokan, Okinawa, Japan, March 9, 2023.

• *Construction of a canonical p-energy on the Sierpiński carpet* (short talk), Smooth Functions on Rough Spaces and Fractals with Connections to Curvature Functional Inequalities, Banff International Research Station, Banff, Canada, November 24, 2022.

• *Construction of a canonical p-energy on the Sierpiński carpet* (contributed talk), PIMS-CRM Summer School in Probability 2022, University of British Columbia, Vancouver, Canada, June 9, 2022.

• *Construction of a canonical p-energy on the Sierpiński carpet* (short talk via Zoom), Analysis on Metric Spaces Workshop 2022, OIST & zoom, Okinawa, Japan, May 27, 2022.

• *Construction of a canonical p-energy on the Sierpiński carpet*, Quasiworld, UCLA (zoom), October 20, 2021.

• *Generalized resistance metrics on graphs* (30 minutes talk), Kobe Workshop on Probabilistic Potential Theory and Related Fields, Kobe, Japan, May 7, 2019.