Shuntaro Togo

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EDUCATION

B.S. Agricultural and Environmental Engineering — Apr. 2020 - Mar. 2024
Kyoto University, Kyoto

M.S. Environmental Science and Technology — Apr. 2024 - Present
Kyoto University, Kyoto

Coursework: Hydrology, Numerical analysis, Stochastic differential equations, etc.

Undergraduate thesis and abstract

(thesis: https://github.com/togoshun/Undergraduate/blob/master/grad_thesis.pdf)
(abstract: https://github.com/togoshun/Undergraduate/blob/master/grad_abstract.pdf)

RESEARCH EXPERIENCE

Modeling and analysis of subsurface water flows — Apr. 2023 - Present

Investigating the analytical solution of the Boussinesq groundwater equation, which governs the groundwater movement.

Stochastic processes for a porous media equation — Apr. 2023 - Present

Applying stochastic processes to soil water dynamics by numerically solving a stochastic Richards-Richardson equation.

Research Intern, Prof. Amir AghaKouchak's Lab, University of California, Irvine — Feb. 2025 - Mar. 2025

Worked on the development of a groundwater model integrating remote sensing data, and gained experience in statistical hydrology by applying ProNEVA (a process-informed nonstationary extreme value analysis tool).

PUBLICATIONS

- Shuntaro Togo, Koichi Unami: "Backward Similarity Solution of the Boussinesq Groundwater Equation," (Under review). [arXiv:2509.07478]
- Koichi Unami, Sahar Altaee, Rasha M. Fadhil, and Shuntaro Togo: "Innovation in Groundwater Hydraulics using Singular-Degenerate Differential Equations," *in Proceedings of the 9th International Arab Conference on Mathematics and Computations (IACMC 2025)*, Jordan, May 7-9, 2025. (Accepted for publication)

CONFERENCE PARTICIPATION

- Shuntaro Togo, Koichi Unami: "Porous media equations to visualize subsurface water flows" Fieldnet Lounge Symposium Visualizing Diverse Socio-Environmental Systems: Toward Robustness Beyond Resilience, Dec. 3, 2023.

(abstract: https://fieldnet-aa.jp/lounge/.assets/20231203_abstract.pdf)

- Shuntaro Togo, Koichi Unami, Masayuki Fujihara: "One-dimensional Boussinesq equations with time-locally unbounded boundary conditions"Japan Society of Agricultural and Rural Engineering, Applied Hydraulic Research Division, Nov. 30, 2024.

  (abstract (Japanese): https://www.jsidre.or.jp/wordpress/wp-content/uploads/2024/11/ouyouR6proceedings_241130.pdf)

- Shuntaro Togo, Koichi Unami, Masayuki Fujihara: "Time-Dependent Groundwater Flows with Similarity Properties" International Society of Paddy and Water Environment Engineering, Oct. 27, 2025.

  (abstract: https://pawees2025-morioka.com/common/files/extended_abstract.pdf).

- Shuntaro Togo, Koichi Unami, Masayuki Fujihara: "Monte-Carlo methods for porous medium equations"Japan Society of Agricultural and Rural Engineering, Applied Hydraulic Research Division, Nov. 30, 2025. (Scheduled for oral presentation).

- Shuntaro Togo, Koichi Unami, Masayuki Fujihara: "A Stochastic Partial Differential Equation Model for Soil Moisture Dynamics" American Geophysical Union Fall Meeting, Dec. 15-19, 2025. (Accepted for poster presentation).

  (abstract: https://agu.confex.com/agu/agu25/meetingapp.cgi/Paper/1906494)

GRANTS AND SCHOLARSHIPS

Akio Kiyokawa Scholarship Apr. 2024 - Mar. 2025

Awarded to students from a wide range of fields; recognized as a promising researcher contributing to the sustainable development of primary industries.

Grant for Overseas Research by the Division of Graduate Studies (DoGS), Kyoto University Sep. 2024 - Mar. 2025

Selected as one of 24 recipients out of 101 graduate students to support international research activities.

Research Funding under the Distinguished Doctoral Program of Platforms, Kyoto University Jun. 2025 - Present

Competitive research grant awarded through the Distinguished Doctoral Program of Platforms at Kyoto University to support graduate research activities.

ADDITIONAL EXPERIENCE

Teaching Assistant Apr. 2024 - Present

Supported undergraduate students in writing programs in the course, "Computational Hydraulics." Helped with discussions, experiments, and fieldwork in the class, "Laboratory Course in Hydraulics." Assisted in the course "Hydraulics". Assisted in grading assignments of the class, "Water-Use Systems Engineering".

Research Assistant Aug. 2024 - Present

Research assistance relating to 'Kyoto University School of Platforms' (KUSP) to make a platform analyzing information from the real world and sharing it with society.

(KUSP: https://www.platforms.ceppings.kyoto-u.ac.jp/en/)

TECHNOLOGIES

Programming languages
C++, Python, Julia, bash