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

Developed a groundwater model integrading remote sensing data and gained experience in statistical hydrology, 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, 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, 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, 2025. (Accepted for oral presentation).
- Shuntaro Togo, Koichi Unami, Masayuki Fujihara: "A Stochastic Partial Differential Equation Model for Soil Moisture Dynamics" American Geophysical Union Fall Meeting, 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

Helped with discussions, experiments, and fieldwork in the undergraduate 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
Python, Julia, C++, C, bash