Yusuke Izawa, Assistant Professor, PyPy Contributor

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Education

2020-2023 🔖 **Ph.D. Mathematical and Computing Science, Tokyo Institute of Technology**.
Thesis title: *Supporting multi-scope and multi-level compilation in a meta-tracing just-in-time compiler.* (GPA 3.49)

2018-2020 🔖 **M.Sc. Mathematical and Computing Science, Tokyo Institute of Technology**.
Thesis title: *Stack Hybridization: A Mechanism for Bridging Two Compilation Strategies in a Meta Compiler Framework.*

2014-2018 🔖 **B.Sc. Mathematical and Computing Science, Tokyo Institute of Technology**.
Thesis title: *BacCaml: A Meta-JIT Compiler Based on Both Tracing and Method JIT Compilations.*

Employment History

2025.06 – 2025.09 🔖 Heinrich-Heine-Universität Düsseldorf, Guest Researcher.
2023.04 – now 🔖 Tokyo Metropolitan University, Assistant Professor.
2023.04 – 2024.03 🔖 IBM Research – Tokyo, Research Scientist.
2023.04 – 2023.04 🔖 JSPS Research Fellow PD. (declined)
2021.08 – 2021.10 🔖 IBM Research – Tokyo, Research Internship (Paid).
2021.04 – 2023.03 🔖 JSPS Research Fellow DC2.
2020.11 – 2023.03 🔖 Tokyo Institute of Technology, Dept. of Math. and Comp., Research Assistant.

Selected Grants, Honours and Scholarships

2025 🔖 **Tokyo Metropolitan University, Dispatching of Young Researchers to Overseas to Strengthen Research Capabilities**. Living expenses are covered by Tokyo Metropolitan University Fund.

2024 🔖 **Graint-in-Aid for Research Activity Start-up**. Research expenses are convered by KAKENHI.

2023 🔖 **Research Fellowship for Young Scientists (JSPS PD).** Fellowship from the Japan Society for the Promotion of Science (JSPS), covering living expenses. Research expenses covered by KAKENHI. (declined)

2021 🔖 **Research Fellowship for Young Scientists (JSPS DC2)**. Fellowship from the Japan Society for the Promotion of Science (JSPS), covering living expenses. Research expenses covered by KAKENHI.

2020 🔖 **JST Strategic Basic Research Programs ACT-X**. Research expenses covered by Japan Science and Technology Agency (JST).

2019 🔖 **2nd Place, Graduate Category, ACM Student Research Competition,** *Association for Computing Machinery.* **[*]**

Selected Publications

Journal

1 Yusuke Izawa, Hidehiko Masuhara, Carl Friedrich Bolz-Tereick, and Youyou Cong. "Threaded Code Generation with a Meta-Tracing JIT Compiler." In: *Journal of Object Technology* (2022), 2:1–11. ISSN: 1660-1769. 🔗DOI: 10.5381/jot.2022.21.2.a1. arXiv: 2106.12496.

(2) Shusuke Takahashi, Yusuke Izawa, Hidehiko Masuhara, and Youyou Cong. "An approach to collect object graphs for data-structure live programming based on a language implementation framework." In: *Journal of Information Processing* 30 (2022), pp. 451–463. ⚭DOI: 10.2197/ipsjjip.30.451.

Conference Proceedings

(1) Yusuke Izawa, Hidehiko Masuhara, and Carl Friedrich Bolz-Tereick. "A Lightweight Method for Generating Multi-Tier JIT Compilation Virtual Machine with a Meta-Tracing Compiler Framework." In: *39th European Conference on Object-Oriented Programming (ECOOP 2025)*. Leibniz International Proceedings in Informatics (LIPIcs). Bergen, Norway: Schloss Dagstuhl – Leibniz-Zentrum für Informatik, 2025.

(2) Yusuke Izawa, Junichiro Kadomoto, Hidetsugu Irie, and Shuichi Sakai. "Designing a Reactive Programming Language for Shape-Adaptive Computers." In: 31st Asia-Pacific Software Engineering Conference (APSEC 2024). Chongquing, China: IEEE, 2024.

(3) Yusuke Izawa and Hidehiko Masuhara. "Amalgamating Different JIT Compilations in a Meta-Tracing JIT Compiler Framework." In: *Proceedings of the 16th ACM SIGPLAN International Symposium on Dynamic Languages*. DLS 2020. Virtual, USA: Association for Computing Machinery, Nov. 17, 2020, pp. 1–15. ISBN: 9781450381758. ⚭DOI: 10.1145/3426422.3426977.

Selected Projects

2021-	🔖	**Adaptive RPython.** This project lets the RPython framework do an adaptive compilation, which can select an appropriate compilation strategy depending on a runtime situation.
2020-	🔖	**Poly2Kanon.** Kanon is a live programming environment that can visualize data structures while editing code. Poly2Kanon aims to extend Kanon to support multi-language and multi-environment features.
2019-2020	🔖	**BacCaml.** It is a simple meta-tracing compiler framework, which can perform trace- and method-based compilations. It implements RPython-like tracing compilation by extending the MinCaml compiler.

Selected Academic Services

2025	🔖	Programming and Programming Language Workshop (PPL), Program Committee.
2024	🔖	External Reviewer, The Programming Journal, Volume 8. Issue 2.
	🔖	Reviewer, ACM Transactions on Software Engineering and Methodology.
	🔖	Program Committee, MPLR 2024, ICCQ 2024, MoreVMs 2024.
2023	🔖	Program Committee, ICSME 2023 (Industry Track), ICCQ 2023.
	🔖	Artifact Evaluation Committee, The Programming Journal, Volume 8.
2022	🔖	Artifact Evaluation Committee, The Programming Journal, Volume 7.
2021	🔖	Artifact Evaluation Committee, PACT 2021, ECOOP 2021.
2020	🔖	Co-reviewer of Onward! Essays, SPLASH 2020.

Teaching

2024	🔖	Research Seminar for Electric Engineering and Computer Science. Tokyo Metropolitan University.
	🔖	Scripting Language Exercise. Tokyo Metropolitan University.
	🔖	Information System Experiment I, II. Tokyo Metropolitan University.

Teaching (continued)

	Programming Exercise (EECS) II. Tokyo Metropolitan University.
2020	Programming II, Tokyo Institute of Technology, Math. and Comp. Science, TA.
2019	Programming II, Tokyo Institute of Technology, Math. and Comp. Science, TA.
	Introduction to Computer Science, Tokyo Institute of Technology, TA.
2018	Programming II, Tokyo Institute of Technology, Math. and Comp. Science, TA.
	Information Literacy I, Tokyo Institute of Technology, TA.

Skills

Languages	English (fluent), Japanese (native)
Coding	OCaml (S), Scala (S), Python (S), C (A), Java (A), Ruby (A), Shell (A), R (B), SQL (C), LaTeX(SS)
Misc.	Academic research, teaching, training, consultation, LaTeX typesetting and publishing.