Yusuke Izawa, Ph.D. student, PyPy Contributor

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Education

2020-now **Ph.D., Tokyo Institute of Technology**.

2018-2020 **M.Sc. Mathematical and Computing, 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, Tokyo Institute of Technology**.
Thesis title: *BacCaml: A Meta-JIT Compiler Based on Both Tracing and Method JIT Compilations*

Employment History

2021.08 – 2021.10 IBM Research – Tokyo, Research Internship (Paid).

2021.04 – 2023.3 JSPS Research Fellow (DC2).

2020.11 – 2023.3 Tokyo Institute of Technology, Dept. of Math. and Comp., Research Assistant.

2018.6 – 2019.2 Recruit Marketing Partners, Inc., Software Engineer, Self-employment.

2018.8 Cookpad, Inc., Software Engineer, Internship (**Won 2nd Place**, Paid).

2017.4 – 2018.3 FOLIO, Inc., Software Engineer, Internship (Paid).

2016.8 – 2017.3 DOWANGO, Inc., Software Engineer, Internship (Paid).

2016.1 – 2016.6 Summaly, Inc., Software Engineer, Internship (Paid).

Grants, Honours and Scholarships

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).

Tokyo Tech Tsubame Scholarship for Doctoral Students. Covering living expenses.

2019 **Travel Grants by Information Science Incentive Fund**. By dept. of mathematical and computing science, Tokyo Tech.

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

2014 **Scholarship by the Showa Scholarship Foundation**. Covering living expensed by Showa Scholarship Foundation.

Journal

Refereed

1. 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* (Jan. 2022). Presented at the IPSJ PRO 2021-3-(5) in November 2021. 13 pages. In press.

2. Yusuke Izawa, Hidehiko Masuhara, Carl Friedrich Bolz-Tereick, and Youyou Cong. "Threaded Code Generation with a Meta-Tracing JIT Compiler." In: *The Journal of Object Technology Special Issue for ICOOOLPS 2021* (Dec. 2021). Presented at the ICOOOLPS 2021 workshop in July 2021. 11 pages. In press. arXiv: 2106.12496.

Conference Publications

Refereed

1. Yusuke Izawa, Hidehiko Masuhara, and Carl Friedrich Bolz-Tereick. "Two-level Just-in-Time Compilation with One Interpreter and One Engine." In: *The ACM SIGPLAN Workshop on Partial Evaluation and Program Manipulation*. PEPM 2022. **Refereed**. Short paper. 7 pages. Virtual, Jan. 17, 2022. arXiv: 2201.09268. URL: https://popl22.sigplan.org/details/pepm-2022-papers/3/Two-level-Just-in-Time-Compilation-with-One-Interpreter-and-One-Engine.
2. 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. **Refereed**. 15 pages. Virtual, USA: Association for Computing Machinery, Nov. 17, 2020, pp. 1–15. ISBN: 9781450381758. DOI: 10.1145/3426422.3426977.
3. Hidehiko Masuhara, Shusuke Takahashi, Yusuke Izawa, and Youyou Cong. "Toward a Multi-Language and Multi-Environment Framework for Live Programming." In: *Proceedings of the 6th Workshop on Live Programming*. Live 2020. **Refereed**. 5 pages. Virtual, 2020, pp. 1–5. URL: http://liveprog.org/live-2020/Toward-a-Multi-Language-and-Multi-Environment-Framework-for-Live-Programming/.
4. Yusuke Izawa. "BacCaml: The Meta-Hybrid Just-in-Time Compiler." In: *Proceedings of the Conference Companion of the 3rd International Conference on Art, Science, and Engineering of Programming*. Programming 2019. **Refereed**. **Awarded [*]**. 3 pages. Genova, Italy: Association for Computing Machinery, Apr. 2, 2019, pp. 1–3. ISBN: 9781450362573. DOI: 10.1145/3328433.3328466.
5. Yusuke Izawa, Hidehiko Masuhara, and Tomoyuki Aotani. "Extending a Meta-Tracing Compiler to Mix Method and Tracing Compilation." In: *Proceedings of the Conference Companion of the 3rd International Conference on Art, Science, and Engineering of Programming*. Programming 2019. **Refereed**. 3 pages. Genova, Italy: Association for Computing Machinery, Apr. 2, 2019, pp. 1–3. ISBN: 9781450362573. DOI: 10.1145/3328433.3328439.

Nonrefereed

1. Yusuke Izawa, Hidehiko Masuhara, Tomoyuki Aotani, and Youyou Cong. "A Stack Hybridization for Meta-hybrid Just-in-time Compilation." In: *Proceedings of the 36th JSSST Annual Conference*. Ed. by Kei Ito. Nonrefereed. Japan Society for Software Science and Technology (JSSST). Shibaura Institute of Technology, Tokyo, Japan, Aug. 27, 2019, pp. 1–9. URL: http://jssst.or.jp/files/user/taikai/2019/proceedings.html.

Talks

Refereed

1. Yusuke Izawa, Hidehiko Masuhara, Carl Friedrich Bolz-Tereick, and Youyou Cong. *Threaded Code Generation with a Meta-tracing JIT Compiler*. The 16th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems (ICOOOLPS 2021). **Refereed**. Virtual, July 13, 2021. arXiv: 2106.12496v4. URL: https://conf.researchr.org/track/ecoop-issta-2021/ecoop-issta-2021-icooolps.

Nonrefereed

1. Yusuke Izawa, Hidehiko Masuhara, and Carl Friedrich Bolz-Tereick. *A wild (meta-)tracing baroque*. SIGPX9. Mar. 23, 2022. URL: https://sigpx.org/9/.
2. 伊澤 侑祐. *A Meta-JIT Commpiler That Rules Them All*. 通研共同プロジェクト「型主導コンパイルによる高性能高信頼ソフトウェ ア構成」研究発表会. Mar. 18, 2022.
3. 伊澤 侑祐, 堀江 倫大, 緒方 一則, and 千葉 立寛. *Java* **静的コンパイラを用いた** *Quarkus* **フレームワークの性能評価**. 情報処理学会第 136 回プログラミング研究会 PRO 2021-3-(6). Nov. 1, 2021. URL: https://sigpro.ipsj.or.jp/pro2021-3/program/.
4. 高橋 修祐, 伊澤 侑祐, 増原 英彦, and 叢 悠悠. **データ構造ライブプログラミングのための言語実現フレームワークに基づくオブジェクトグラフ収集手法**. 情報処理学会第 136 回プログラミング研究会 PRO 2021-3-(5). Nov. 1, 2021. URL: https://sigpro.ipsj.or.jp/pro2021-3/program/.
5. 伊澤 侑祐. **汎用性と高性能を両立するハイブリッド型実行時コンパイラ**. JST ACT-X 第 5 回領域会議. Poster Presentation. Nov. 2021.
6. 高橋 修祐, 伊澤 侑祐, 増原 英彦, and 叢 悠悠. **言語実現フレームワークに基づく汎言語的オブジェクトグラフ収集手法**. 情報処理学会第 135 回プログラミング研究会 PRO 2021-2-(7). July 21, 2021. URL: https://sigpro.ipsj.or.jp/pro2021-2/program/.
7. 伊澤 侑祐. **汎用性と高性能を両立するハイブリッド型実行時コンパイラ**. JST ACT-X 第 4 回領域会議. June 2021.
8. Yusuke Izawa and Hidehiko Masuhara. *Amalgamating Different JIT Compilations in a Meta-tracing JIT Compiler Framework*. The 23nd JSSST Workshop on Programming and Programming Languages. Reproduction of the DLS'20 talk at JSSST PPL. Mar. 2021. URL: https://jssst-ppl.org/workshop/2021/.
9. Yusuke Izawa, Hidehiko Masuhara, and Youyou Cong. *An Interpreter Design for Supporting Different JIT Compilations in RPython Framework*. The 23nd JSSST Workshop on Programming and Programming Languages. Poster Presentation. Mar. 2021. URL: https://easychair.org/smart-program/PPL2021/.
10. Shusuke Takahashi, Yusuke Izawa, Hidehiko Masuhara, and Youyou Cong. **汎言語的ライブプログラミング環境のためのデータ構造解析手法**. The 23nd JSSST Workshop on Programming and Programming Languages. Poster Presentation. Mar. 2021. URL: https://easychair.org/smart-program/PPL2021/.
11. 伊澤 侑祐. **汎用性と高性能を両立するハイブリッド型実行時コンパイラ**. JST ACT-X 第 3 回領域会議. Dec. 2020.
12. Shusuke Takahashi, Yusuke Izawa, Hidehiko Masuhara, and Youyou Cong. **ライブプログラミング環境は多言語化/多開発環境化の夢を見るか**. The 37th JSSST Anual Conference. Japan Society for Software Science and Technology. Poster Presentation. Sept. 2020. URL: https://jssst2020.wordpress.com/program/.
13. Yusuke Izawa and Hidehiko Masuhara. *Making different JIT Compilations Dancing to the Same Tune, Acting in the Meta-level*. The 22nd JSSST Workshop on Programming and Programming Languages. Poster Presentation. Mar. 2020. URL: https://easychair.org/smart-program/PPL2020/.
14. Yusuke Izawa, Hidehiko Masuhara, and Tomoyuki Aotani. *Meta-hybrid JIT Compilation Approach for the Path-divergence Problem*. The Kumiki 6.0 Meeting. Dec. 2019.
15. Yusuke Izawa, Hidehiko Masuhara, and Tomoyuki Aotani. **メタ混合** *JIT* **コンパイラの提案**. The 20nd JSSST Workshop on Programming and Programming Languages. Poster Presentation. Mar. 2018. URL: https://jssst-ppl.org/workshop/2018/program.html.

Academic Services

- 2022 Artifact Evaluation Committee, The Programming Journal, Volume 7.
- 2021 Organizing Committee, the 2nd ACT-X Meeting for Researchers 2021.
- Artifact Evaluation Committee, PACT 2021.
- Artifact Evaluation Committee, ECOOP 2021.
- Panelist, Reception of PPL 2021.
- 2020 Member of Student Volunteer, SPLASH 2020.
- Co-reviewer of Onward! Essays, SPLASH 2020.
- External reviewer of Scala Symposium, ECOOP 2020.
- Candidate of Programming Language Mentoring Workshop, PLDI 2020.
- 2019 Member of Student Volunteer, Programming 2019.

Teaching

- 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.