

# 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 ICPOOLPS 2021* (Dec. 2021). Presented at the ICPOOLPS 2021 workshop in July 2021. 11 pages. In press. arXiv: 2106.12496.


## Conference Publications

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### 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

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### 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 (ICPOOLPS 2021). **Refereed**. Virtual, July 13, 2021. arXiv: 2106.12496v4.  URL: <https://conf.researchr.org/track/ecoop-issta-2021/ecoop-issta-2021-icoolps>.

### 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/](https://sigpx.org/9/).
- 2 伊澤侑祐. *A Meta-JIT Compiler 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/](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/](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/](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 23rd 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/](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 23rd JSSST Workshop on Programming and Programming Languages. Poster Presentation. Mar. 2021. [URL: https://easychair.org/smart-program/PPL2021/](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 23rd JSSST Workshop on Programming and Programming Languages. Poster Presentation. Mar. 2021. [URL: https://easychair.org/smart-program/PPL2021/](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 Annual Conference. Japan Society for Software Science and Technology. Poster Presentation. Sept. 2020. [URL: https://jssst2020.wordpress.com/program/](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/](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](https://jssst-ppl.org/workshop/2018/program.html).

## Academic Services

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- 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

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- 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

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