

# 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).
- 2020    📖 **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.
- 2019    📖 **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    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). Presented at the ICOOLPS 2021 workshop in July 2021., 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). Presented at the IPSJ PRO 2021-3-(5) in November 2021., pp. 451–463.  DOI: 10.2197/ipsjip.30.451.


## 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 and Hidehiko Masuhara. *Taming an Interpreter for Threaded Code Generation with a Tracing JIT Compiler*. The 17th Workshop on Implementation, Compilation, Optimization of Object-Oriented Languages, Programs and Systems (ICOOOLPS 2022). **Refereed**. Berlin, Germany, June 7, 2022.  URL: <https://2022.ecoop.org/home/ICOOOLPS-2022>.
- 2 Shusuke Takahashi, Yusuke Izawa, Hidehiko Masuhara, and Youyou Cong. *Efficient Object Graph Recording with Truffle for Live Data-Structure Programming*. Truffle/GraalVM Languages Workshop (Truffle 2022). **Refereed**. Berlin, Germany, June 7, 2022.  URL: <https://2022.ecoop.org/home/truffle-2022>.











- 3 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-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/>.
- 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/>.
- 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 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/>.
- 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/>.
- 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/>.
- 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/>.
- 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),  $\text{\LaTeX}$ (SS)
- Misc.  Academic research, teaching, training, consultation,  $\text{\LaTeX}$  typesetting and publishing.