Yusuke Izawa

2 Chome-12-1 Ookayama
Meguro City, Tokyo 152-8550, Japan

Phone: +8190-4027-6104
Email: izawa@prg.is.titech.ac.jp
URL: https://3ttyon.github.io

Current position

PhD Candidate, Department of Mathematical and Computing Science, Tokyo Institute of Technology

Areas of specialisation

Computer Science; Programming Language

Work experience

2018-2019	Recruit Marketing Partners, Inc., Software Engineer, Self-employment.
2018	Cookpad, Inc., Software Engineer, Internship. (Won **2nd Place**)
2016-2017	FOLIO, Inc., Software Engineer, Internship.
2016-2017	KADOKAWA, Inc., Software Engineer, Internship.
2015-2016	Summaly, Inc., Software Engineer, Internship.

Education

2020	MSc in Mathematical and Computing Science, Tokyo Institute of Technology.
2018	BSc in Mathematical and Computing Science, Tokyo Institute of Technology.

Grants, honours & awards

2021.4-2023.3 **Research Fellowship for Young Scientists (JSPS DC2)【日本学術振興会特別研究員 DC2】.**
Fellowship from the Japan Society for the Promotion of Science (JSPS), covering living expenses. Research expenses covered by KAKENHI (科研費).

2020.4-2021.3 **Tokyo Tech Tsubame Scholarship for Doctoral Students【東京工業大学 つばめ博士学生奨学金】.**
Tokyo Tech's scholarship for doctoral students, covering living expenses.

2019.4 **2nd Place**, Graduate Category, ACM Student Research Competition, *Association for Computing Machinerty.* [★]

2019.4	**Information Science Incentive Fund【情報科学奨励基金】.**
	Travel grants by dept. of mathematical and computing science, Tokyo Tech.
2014.4-2018.3	**Scholarship by the Showa Scholarship Foundation 【昭和奨学会奨学金】.**
	Japanese scholarship by Showa Scholarship Foundation (昭和奨学会), covering living expenses.

Publications & talks

2020	Yusuke Izawa, and Hidehiko Masuhara. Amalgamating Different JIT Compilations in a Meta-tracing JIT Compiler Framework. DLS 2020: Proceedings of the 16th ACM SIGPLAN International Symposium on Dynamic Languages. November 2020. 14 pages. (accepted)
2020	高橋修祐, 伊澤侑祐, 増原英彦. 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 (JSSST'20). No. 69. September 2020. Poster Presentation (in Japanese).
2020	Yusuke Izawa. Toward Hybrid Compilation in a Practical Meta-tracing JIT Compiler. Programming Language Mentoring Workshop, 41st ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI '20). June 2020. Oral Presentation.
2020	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 (PPL '20), March 2020. Poster Presentation.
2019	Yusuke Izawa, Hidehiko Masuhara, Tomoyuki Aotani, and Youyou Cong. A stack hybridization for meta-hybrid just-in-time compilation. In Kei Ito, editor, Proceedings of the 36th JSSST Annual Conference, pages No. 2 – L. Japan Society for Software Science and Technology (JSSST'19), August 2019.
2019	Yusuke Izawa, Hidehiko Masuhara, and Tomoyuki Aotani. 2019. 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 '19). ACM, New York, NY, USA, Article 5, 1 – 3. DOI: https://doi.org/10.1145/3328433.3328439
2019	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 '19). ACM, New York, NY, USA, Article 32, 1 – 3. DOI:https://doi.org/10.1145/3328433.3328466 (**Awarded** [⋆])
2018	Yusuke Izawa, Hidehiko Masuhara, and Tomoyuki Aotani. Meta-hybrid JIT Compilation Approach to the Path Divergence Problem. Kumiki 6.0. November 2018. Oral Presentation.
2018	伊澤侑祐, 増原英彦, 青谷知幸. メタ混合 JIT コンパイラの提案. The 20nd JSSST Workshop on Programming and Programming Languages (PPL '18), March 2018. Poster Presentation (in Japanese).

Teaching

2020 (4Q)	Programming II, Tokyo Institute of Technology, Teaching Assistant
2019 (1Q)	Programming II, Tokyo Institute of Technology, Teaching Assistant

2019 (1Q)	Introduction to Computer Science, Tokyo Institute of Technology, Teaching Assistant
2018 (3Q)	Programming I, Tokyo Institute of Technology, Teaching Assistant
2018 (1Q)	Information Literacy 1, Tokyo Institute of Technology, Teaching Assistant

Academic services

2020	Co-reviewer of Onward! Essays, SPLASH 2020, November 2020.
2020	Candidate of Programming Language Mentoring Workshop, PLDI 2020, June 2020.
2019	Member of Student Volunterr, Programming 2019, April 2019.

Projects

BacCaml (source code at GitHub)

Trace-based compilation and method-based compilation are two major compilation strategies in JIT compilers. In general, the former excels in compiling programs with deeper method calls and more dynamic branches, while the latter is suitable wide range of programs.

This project aims at developing fundamental mechanism for compiling with both trace-based and method-based strategies. Instead of developing a compiler for one particular language, we provide such a mechanism in a meta-compilation framework, which generates a virtual machine with a JIT compiler from an interpreter definition of a programming language.

We are developing the BacCamel meta-compiler framework as a proof-of-concept, which is based on the MinCaml compiler.

Polyglot Kanon (source code at GitHub)

Kanon is a live programming environment that automatically and instantly visualizes runtime data-structures while the programmer is editing a program. Our goal is to have all languages running on top of Kanon and to make the program run fast.