



# Yudai Tanabe

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## PERSONAL STATEMENT

Yudai Tanabe, Ph.D., is an Assistant Professor at the Department of Mathematical and Computing Science, School of Computing, Institute of Science Tokyo. He received B.S., M.S., and D.S. degrees from Tokyo Institute of Technology in 2018, 2020, and 2023 respectively. Formerly, he was a JSPS Research Fellow at Tokyo Institute of Technology until 2023, a program-specific researcher at Kyoto University until 2024, and an assistant professor at the Department of Mathematical and Computing Science, School of Computing, Tokyo Institute of Technology until September 2024. His research interest is programming language and software engineering, especially in programming language theory, type systems, and software maintenance.

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## RESEARCH INTEREST

My research interests focus on programming language design and programming language theory. I am currently engaged in the following research projects:

- Programming Language with Versions. APLAS'23, SLE'22, Programming'22
- Space-efficient Gradual Typing. PLDI'24
- Safe Language Interoperability. WIP.

I am also working with students on projects regarding language design, type systems, GPGPU, and live programming.

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## EDUCATION

<b>Doctor of Science</b>	2023
<i>Department of Mathematical and Computing Science, School of Computing, Tokyo Institute of Technology.</i>	
<b>Master of Science</b>	2020
<i>Department of Mathematical and Computing Science, School of Computing, Tokyo Institute of Technology.</i>	
<b>Bachelor of Science</b>	2018
<i>Department of Information Science, School of Science, Tokyo Institute of Technology.</i>	

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## GRANTS

<b>Programming Supports for Incremental and Interactive Updates through Compatibility-Oriented Program Analysis</b>	2025 – 2028
<i>Japan Society For the Promotion of Science (JSPS), Grant in Aid for Early-Career Scientists</i> 25K21178	
<b>Research on Updating Support Techniques by Introducing Semantic Versioning into Programming Languages</b>	2023 – 2025
<i>Japan Society For the Promotion of Science (JSPS), Grant-in-Aid for Research Activity Start-up</i> 23K19961	
<b>Programming Language with Versions</b>	2022 – 2024
<i>Japan Society For the Promotion of Science (JSPS), Grant-in-Aid for JSPS Research Fellows</i> 22KJ1313 / 22J14382	

## GRANTS (CO-INVESTIGATOR)

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<b>Programming Language Foundations for Highly Reliable Software Code Generation</b>	2026 – 2029
<i>Japan Society For the Promotion of Science (JSPS), Grant in Aid for Scientific Research (A)</i>	26H02493
<b>High-Performance and Highly-Productive Language Infrastructures Based on Language Implementation Frameworks</b>	2023 – 2028
<i>Japan Society For the Promotion of Science (JSPS), Grant in Aid for Scientific Research (B)</i>	23K28058 / 23H03368
<b>Research on software contracts for highly interoperable software modules</b>	2020 – 2025
<i>Japan Society For the Promotion of Science (JSPS), Grant in Aid for Scientific Research (A)</i>	20H00582

## FELLOWSHIPS

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<b>JSPS Research Fellowship for Young Scientists (DC2)</b>	2022 – 2024
<i>Japan Society For the Promotion of Science (JSPS)</i>	
<ul style="list-style-type: none"><li>Withdrawn in 2023 due to my transfer to Kyoto University.</li></ul>	
<b>Tokyo Tech Tsubame Scholarship</b>	2020 – 2022
<i>Tokyo Institute of Technology</i>	

## JOB EXPERIENCE

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<b>Assistant Professor</b>	2024 Spr – 2029 Mar.
<i>Department of Mathematical and Computing Science, School of Computing, Institute of Science Tokyo (renamed due to University merger)</i>	
<b>Assistant Professor</b>	2024 Apr. – 2024 Sep.
<i>Department of Mathematical and Computing Science, School of Computing, Tokyo Institute of Technology</i>	
<b>Program-specific Researcher</b>	2023 – 2024
<i>Computer Software Group, Kyoto University</i>	
<b>JSPS Research Fellow</b>	2022 – 2023
<i>Japan Society for the Promotion of Science</i>	
<b>Research Tokyo Student Intern (paid, part-time)</b>	2021 – 2021
<i>IBM Research Tokyo</i>	
<b>Research Assistant</b>	2021 – 2021
<i>Programming Group, Tokyo Institute of Technology</i>	
<b>Research Tokyo Student Intern (paid, part-time)</b>	2018 – 2018
<i>IBM Research Tokyo</i>	
<b>Editorial / Technical Assistant</b>	2014 – 2022
<i>MYU Research</i>	

## TEACHING EXPERIENCE AS AN EDUCATOR

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<b>Forum on Computing</b>	2024 – 2026
<i>Institute of Science Tokyo</i>	Lecturer
<b>Programming II</b>	2025 – 2026
<i>Institute of Science Tokyo</i>	Lecturer
<b>Research opportunity in Laboratories (MCS)</b>	2024 – 2026
<i>Institute of Science Tokyo</i>	Lecturer
<b>Forum on Computing</b>	2024
<i>Tokyo Institute of Technology</i>	Lecturer
<b>Programming II</b>	2024
<i>Tokyo Institute of Technology</i>	Lecturer

<b>Information Literacy 2</b> <i>Tokyo Institute of Technology</i>	2018 – 2020 <i>Teaching Assistant</i>
<b>Introduction to Computer Science</b> <i>Tokyo Institute of Technology</i>	2018 – 2020 <i>Teaching Assistant</i>
<b>Programming I</b> <i>Tokyo Institute of Technology</i>	2019 – 2020 <i>Teaching Assistant</i>
<b>Information Literacy 1</b> <i>Tokyo Institute of Technology</i>	2018 <i>Teaching Assistant</i>

## PUBLICATIONS

<b>A Lightweight Implementation for Efficient Multi-Stage Computation Using a Tracing JIT Compiler</b> <i>Yusei Yoshimura, Yudai Tanabe, Hidehiko Masuhara</i> In Proceedings of the the 28th Workshop on Programming and Programming Languages (PPL2026)	2026 <i>PPL</i>
<b>Multi-Version Objects: Mediating Object Access in Mixed-Version Programs for Python</b> <i>Satsuki Kasuya, Yudai Tanabe, Hidehiko Masuhara</i> In Proceedings of the the 28th Workshop on Programming and Programming Languages (PPL2026)	2026 <i>PPL</i>
<b>Towards Borrowable Ownership Types with Algebraic Effect Handlers</b> <i>Peien Chen, Yudai Tanabe, Taro Sekiyama</i> In Proceedings of the the 28th Workshop on Programming and Programming Languages (PPL2026)	2026 <i>PPL</i>
<b>An Efficient Execution Mechanism on a GPU for Fine-Grained Parallel Programs With the Fork-Join Model</b> <i>Kosuke Kiuchi, Yudai Tanabe, Hidehiko Masuhara</i> In Journal of Information Processing, Vol. 33, pp. 840-851, DOI: 10.2197/ipsjjip.33.840	2025 <i>JIP</i>
<b>Dynamic Version Checking for Gradual Updating</b> <i>Satsuki Kasuya, Yudai Tanabe, Hidehiko Masuhara</i> In Journal of Information Processing, Vol. 33, pp. 471-486, DOI: 10.2197/ipsjjip.33.471	2025 <i>JIP</i>
<b>Space-Efficient Polymorphic Gradual Typing, Mostly Parametric</b> <i>Atsushi Igarashi, Shota Ozaki, Taro Sekiyama, Yudai Tanabe</i> In Proceedings of the ACM on Programming Languages (PACMPL), Vol. 8, No. PLDI, DOI: 10.1145/3656441	2024 <i>PLDI</i>
<b>Compilation Semantics for a Programming Language with Versions</b> <i>Yudai Tanabe, Luthfan Anshar Lubis, Tomoyuki Aotani, Hidehiko Masuhara</i> In Programming Languages and Systems. APLAS 2023, pp. 3–23, DOI: 10.1007/978-981-99-8311-7_1	2023 <i>APLAS</i>
<b>A Step toward Programming with Versions in Real-World Functional Languages</b> <i>Yudai Tanabe, Luthfan Anshar Lubis, Tomoyuki Aotani, Hidehiko Masuhara</i> In Proceedings of the 14th ACM International Workshop on Context-Oriented Programming and Advanced Modularity, pp. 44–51, DOI: 10.1145/3570353.3570359	2022 <i>COP</i>
<b>BatakJava: An Object-Oriented Programming Language with Versions</b> <i>Luthfan Anshar Lubis, Yudai Tanabe, Tomoyuki Aotani, Hidehiko Masuhara</i> In Proceedings of the 15th ACM SIGPLAN International Conference on Software Language Engineering, pp. 222–234, DOI: 10.1145/3567512.3567531	2022 <i>SLE</i>
<b>A Functional Programming Language with Versions</b> <i>Yudai Tanabe, Luthfan Anshar Lubis, Tomoyuki Aotani, Hidehiko Masuhara</i> In The Art, Science, and Engineering of Programming, Vol. 6, No. 1, pp. 5:1–5:30, DOI: 10.22152/programming-journal.org/2022/6/5	2021 <i>Programming</i>

**A Context-Oriented Programming Approach to Dependency Hell** 2018  
*Yudai Tanabe, Tomoyuki Aotani, Hidehiko Masuhara* COP  
In Proceedings of the 10th ACM International Workshop on Context-Oriented Programming: Advanced Modularity for Run-time Composition, pp. 8–14, DOI: 10.1145/3242921.3242923

## EDITED PROCEEDINGS

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**COP 2023: Proceedings of the 15th ACM International Workshop on Context-Oriented Programming and Advanced Modularity** 2023  
*Yudai Tanabe, Lars Schütze, Robert Hirschfeld, Atsushi Igarashi, Hidehiko Masuhara* Proceedings  
In Association for Computing Machinery, DOI: 10.1145/3605154

**COP '22: Proceedings of the 14th ACM International Workshop on Context-Oriented Programming and Advanced Modularity** 2022  
*Yudai Tanabe, Jens Lincke, Robert Hirschfeld, Atsushi Igarashi, Hidehiko Masuhara* Proceedings  
In Association for Computing Machinery, DOI: 10.1145/3570353

## INVITED TALKS

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**Language-Level Support for Multiple Versions for Software Evolution** Nov. 2025  
*The 24th Belgium-Netherlands Software Evolution Workshop (BENEVOL2025), Keynote Talk & Summary of Highlights and Outstanding Work (SHOW) Track*

**Chasing Efficiency in Sound Gradual Typing** Nov. 2025  
第 156 回プログラミング研究会若手研究者招待講演

**Chasing Sound and Practical Gradual Typing, in Action** Sep. 2025  
*NII Karuizawa Seminar*

**Bringing Fine-Grained Task Parallelism to GPUs** Jun. 2025  
*MIT-Toyohashi ASPIRE workshop 2025*

**トレーシング JIT コンパイラは多段階計算を救えるか？** Jun. 2025  
*The 2nd Workshop on Metaprogramming and Related Topics 2025*

**Space-Efficient Polymorphic Gradual Typing, Mostly Parametric** Sep. 2024  
*The 41st JSSST Annual Conference, Top-tier Conference Special Lecture*

**Programming Language with Versions** May 2024  
*The 7th STAIR Lab ST Seminar*

**A Language to Safely Exploit Multi-Version Modules at the Expression-level** Jul. 2021  
*The 13th ACM SIGPLAN International Workshop on Context-Oriented Programming and Advanced Modularity (COP 2021)*

## ACADEMIC SERVICE

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### Program Committee

**2026:** APLAS & ATVA, SRC & Posters • ICCQ • SLE  
**2025:** PPL  
**2024:** ECOOP • APLAS SRC & Posters • TyDe • ICCQ  
**2023:** APSEC SRC • APLAS SRC & Posters • ICSME Industry Track • COP • ICCQ  
**2022:** COP

### External Reviewer

**2024:** APSEC  
**2022:** PeerJ Computer Science  
**2021:** Scheme  
**2020:** Onward! Essays

### Artifact Evaluation Committee

**2025:** PLDI Research Artifacts • OOPSLA Artifacts • POPL Artifact Evaluation • Programming  
**2024:** PLDI Research Artifacts • ECOOP Artifact Evaluation • ICFP Artifact Evaluation

## **Organizing Committee**

2024~: PL Joint Seminar

2027: PPL

2026: PPL

2025: PPL

2024: APLAS SRC & Posters • ATVA

2023: COP

2022: COP • PEPM History Project

## **Other Conference Support**

2021: PPL

2020: SPLASH