Oct 26, 2025

Satoshi Takimoto

Contact Information

- Email: takimoto.s.163c@m.isct.ac.jp
- ORCID: 0009-0000-1963-1855
- Webpage: https://wasabi315.github.io/en/
- GitHub: https://github.com/wasabi315
- Address: W8-75, 2-12-1 Oookayama, Meguro-ku, Tokyo 152-8552, Japan
- Phone: +81-3-5734-2772

Research Interests

Functional programming, theorem provers, type theory, reactive programming

Education and Other Experiences

- **Institute of Science Tokyo**, Tokyo, Japan   Oct 2024 – Present
  Doctor of Engineering, expected Sep 2027
  Topic: Library API Search for Theorem Provers
  Supervisor: Takuo Watanabe, Sosuke Moriguchi

- **Tokyo Institute of Technology**, Tokyo, Japan   Apr 2022 – Sep 2024
  Master of Engineering, Sep 2024

- **Chalmers University of Technology**, Göteborg, Sweden   Aug 2022 – Jun 2023
  Academic exchange

- **Tokyo Institute of Technology**, Tokyo, Japan   Apr 2018 – Mar 2022
  Bachelor of Engineering, Mar 2022

Publications

Formalization of Coverage Checking in Agda
Satoshi Takimoto, Sosuke Moriguchi, and Takuo Watanabe
To appear in Proceedings of the Workshop on Computation: Theory and Practice (WCTP 2025).
✎ https://wasabi315.github.io/files/wctp2025a.pdf

Unification Modulo Isomorphism between Dependent Types for Type-Based Library Search
Satoshi Takimoto, Sosuke Moriguchi, and Takuo Watanabe
Proceedings of the 10th ACM SIGPLAN International Workshop on Type-Driven Development
(TyDe2025), Singapore, Singapore, Oct 2025. ✎ 10.1145/3759538.3759651

Formalizing Reversible Computations for Synchronous Dataflow Languages with Infinite Lists
Sosuke Moriguchi, Satoshi Takimoto, Mizuki Shirai, and Takuo Watanabe
Proceedings of the Workshop on Computation: Theory and Practice (WCTP 2024), Manila,
Philippines, Apr 2025. ✎ 10.2991/978-94-6463-684-0_2

Publications (in Japanese)

Mode Management of Peripherals Based on State Transition Model in FRP Language for Embedded Systems
Satoshi Takimoto, Sosuke Moriguchi, and Takuo Watanabe
Computer Software, Issue 1, Volume 42, pp. 40-53, Jan 2025. 🔗 [10.11309/jssst.42.1_40](#)

Projects

Library API Search for Theorem Provers
- Building a semantic library search system for theorem provers to accelerate theorem discovery and reuse.
- Developed a type-based search algorithm for dependent types based on unification modulo type isomorphisms, enabling structure-aware matching including search modulo parameter reordering, definition unfolding, and extra premises.
  ○ [wasabi315/dependent-type-search](#)
- Designing a hybrid method combines type-based and natural-language search for improved relevance.

Formalized Coverage Checker
- Formalized a simple coverage checking algorithm in Agda, which compiles to readable Haskell program. ○ [wasabi315/coverage-checking](#)

Power-mode-aware Functional Reactive Programming
- Designed a domain-specific FRP language for low-power IoT systems with type-level guarantees that prevent access to powered-off peripherals and enable automatic power control.
- Implemented a compiler in OCaml targeting C, generating zero-overhead code compared to manual power control. ○ [wasabi315/XCios](#)

Reversible Synchronous Dataflow Languages
- Building a theory for reversible computation in the context of streaming processing.
- Mechanizing the theory in Rocq/Agda. ○ [psg-titech/IIST_proof](#)

Technical Skills
- Haskell: Fluent
- Agda, OCaml, Rust, TypeScript, JavaScript: Proficient