

<https://yoichihirai.com>  
i@yoichihirai.com

# Yoichi Hirai

A convenience logician.

## Professional Experience

- 2016-2018* Formal verification engineer at Ethereum DEV UG, involving specification of Ethereum Virtual Machine in Isabelle/HOL and an OCaml development of a compiler.
- 2014-2016* Formal verification engineer at FireEye, Inc., involving verification of an operating system kernel.
- 2013-2014* Researcher at National Institute of Advanced Industrial Science and Technology (Japan).
- 2010-2011* Research assistant at Internet Initiative Japan Innovation Institute.
- 2008-2010 (summer)* Teaching assistant for mathematical logic, the University of Tokyo.
- 2006-2009* Part-time programmer for Kokolink, Co., involving analysis and modification of PostgreSQL.

## Awards/Distinctions/Research Funding

- 2011-2013* JSPS Research Fellowships for Young Scientists.
- 2010* Dean's Award.
- 2002* Classified among the 20 best candidates in Japanese Mathematical Olympiad.

## Programming Languages

- proficient* Coq (ssreflect), C, EVM.
- used* Scheme, OCaml, Isabelle/HOL, Haskell, Ruby, Python, C++, VBA, Solidity.

## Natural Languages

Japanese (native), English (advanced: TOEFL iBT 101).

## Education

2010–2013 PhD course in computer science, the University of Tokyo.

2011–2012 Visiting student at ILPS, the University of Amsterdam.

2008–2010 MSc in computer science, the University of Tokyo.

2004–2008 BSc in information science, the University of Tokyo.

## Papers, Presentations and Other Publications

### Refereed Papers

- [1] Alessandro Facchini, Yoichi Hirai, Maarten Marx, Evgeny Sherkhonov: Containment for Conditional Tree Patterns. In *Logical Methods in Computer Science* **11**(2). 2015.
- [2] Yoichi Hirai: A Lambda Calculus for Gödel–Dummett Logic Capturing Waitfreedom, In *FLOPS 2012*, LNCS 7294, pp. 151–165. 2012.
- [3] Kosuke Ono, Yoichi Hirai, Masami Hagiya, Natsuko Noda and Yoshinori Tanabe: Using Coq in Specification and Program Extraction of Hadoop MapReduce Applications, In *SEFM’11*, LNCS 7041, pp. 350–365. 2011.
- [4] Yoichi Hirai and Kazuhiko Yamamoto: Balancing Weight-Balanced Trees. *Journal of Functional Programming*, **21**(03), pp. 287–307. 2011.
- [5] Yoichi Hirai: An Intuitionistic Epistemic Logic for Sequential Consistency on Shared Memory. In *LPAR-16*, LNAI 6355, pp. 272–289. Springer. 2010.

### Theses

- [6] Yoichi Hirai: Hyper-Lambda Calculi, Doctoral Thesis, 2013.
- [7] Yoichi Hirai: An Intuitionistic Epistemic Logic for Asynchronous Communication, Master’s Thesis, 2010. Work supervised by Prof. Masami Hagiya.