

Contact Information

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Personal

Nationality: Japanese

Education

- 03/2011 **PhD. in Mathematics**
Mathematical Institute, Tohoku University, JAPAN
(Advisors: *Kazuyuki Tanaka*, and *Takeshi Yamazaki*)
- 03/2009 **MSc. in Mathematics**
Mathematical Institute, Tohoku University, JAPAN
(Advisor: *Takeshi Yamazaki*)
- 03/2007 **BSc. in Mathematics**
Mathematical Institute, Tohoku University, JAPAN

Career

- 04/2017 – Today **Lecturer**
Graduate School of Informatics, Nagoya University, JAPAN
- 05/2015 – 03/2017 **JSPS Postdoctoral Fellow**
Department of Mathematics, University of California, Berkeley, USA
(Mentor: *Antonio Montalbán*)
- 04/2012 – 03/2015 **JSPS Postdoctoral Fellow**
Japan Advanced Institute of Science and Technology, JAPAN
(Mentor: *Hajime Ishihara*)
- 04/2011 – 03/2012 **JSPS Postdoctoral Fellow**
Mathematical Institute, Tohoku University, JAPAN
(Mentor: *Takeshi Yamazaki*)

Awards

- 01/2013 **The 11th LA/EATCS Best Presentation Award**
European Association for Theoretical Computer Science, Japan Chapter
- 03/2011 **Kawai Prize for PhD thesis**
Kawai Mathematical Sciences Foundation
- 03/2009 **Yūsyū-sōsetsu-Ronbun-Syō (Prize for Master's thesis)**
Kawai Mathematical Sciences Foundation

Publications and Preprints

Journal Articles

1. Vassilios Gregoriades, Takayuki Kihara and Keng Meng Ng, Turing degrees in Polish spaces and decomposability of Borel functions, to appear in *Journal of Mathematical Logic*.
2. Takayuki Kihara, Alberto Marcone and Arno Pauly, Searching for an analogue of ATR_0 in the Weihrauch lattice, to appear in *Journal of Symbolic Logic*.

3. Takayuki Kihara, On a metric generalization of the tt-degrees and effective dimension theory, *Journal of Symbolic Logic* **84** (2) (2019), pp. 726–749.
4. Takayuki Kihara and Antonio Montalbán, On the structure of the Wadge degrees of BQO-valued Borel functions, *Transactions of the American Mathematical Society* **371** (11) (2019), pp. 7885–7923.
5. Josef Berger, Hajime Ishihara, Takayuki Kihara and Takako Nemoto, The binary expansion and the intermediate value theorem in constructive reverse mathematics, *Archive for Mathematical Logic* **58** (1-2) (2019), pp. 203–217.
6. Takayuki Kihara and Antonio Montalbán, The uniform Martin’s conjecture for many-one degrees, *Transactions of the American Mathematical Society* **370** (12) (2018), pp. 9025–9044.
7. Takayuki Kihara, Borel-piecewise continuous reducibility for uniformization problems, *Logical Methods in Computer Science* **12** (4) (2016), pp. 1–35.
8. Takayuki Kihara, Decomposing Borel functions using the Shore-Slaman join theorem, *Fundamenta Mathematicae* **230** (2015), pp. 1–13.
9. Takayuki Kihara and Kenshi Miyabe, Unified characterizations of lowness properties via Kolmogorov complexity, *Archive for Mathematical Logic* **54** (2015), pp. 329–358.
10. Takayuki Kihara, Comparing the Medvedev and Turing degrees of Π_1^0 classes, *Mathematical Structures in Computer Science* **25** (8) (2015), pp. 1649–1668.
11. Kojiro Higuchi and Takayuki Kihara, Inside the Muchnik degrees I: Discontinuity, learnability, and constructivism, *Annals of Pure and Applied Logic* **165** (2014), pp. 1058–1114.
12. Kojiro Higuchi and Takayuki Kihara, Inside the Muchnik degrees II: The degree structures induced by the arithmetical hierarchy of countably continuous functions, *Annals of Pure and Applied Logic* **165** (2014), pp. 1201–1241.
13. Kojiro Higuchi and Takayuki Kihara, On effectively closed sets of effective strong measure zero, *Annals of Pure and Applied Logic* **165** (2014), pp. 1445–1469.
14. Takayuki Kihara and Kenshi Miyabe, Uniform Kurtz randomness, *Journal of Logic and Computation* **24** (2014), pp. 863–882.
15. Makoto Fujiwara, Kojiro Higuchi and Takayuki Kihara, On the strength of marriage theorems and uniformity, *Mathematical Logic Quarterly* **60** (2014), pp. 136–153.
16. Takayuki Kihara, Incomputability of simply connected planar continua, *Computability* **1** (2012), pp. 131–152.
17. Joshua A. Cole and Takayuki Kihara, The *AE*-theory of the effectively closed Medvedev degrees is decidable, *Archive for Mathematical Logic*, **49** (2010), pp. 1–16.
18. Douglas Cenzer, Takayuki Kihara, Rebecca Weber and Guohua Wu, Immunity and non-cupping for closed sets, *Tbilisi Mathematical Journal*, **2** (2009), pp. 77–94.

Proceedings

1. Takayuki Kihara, and Arno Pauly, Finite choice, convex choice and sorting, to appear in proceedings of the 15th Annual Conference on Theory and Applications of Models of Computation (TAMC 2019), *Lecture Notes in Computer Science* **11436** (2019), pp. 378–393.
2. Takayuki Kihara, Higher randomness and lim-sup forcing within and beyond hyperarithmetic, Sets and Computations, *Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore* **33** (2017), pp. 117–155.
3. Takayuki Kihara and Arno Pauly, Dividing by zero – how bad is it, really? In Proceedings of MFCS 2016, *Leibniz International Proceedings in Informatics* **58** (2016), pp. 58:1–58:14.
4. Kojiro Higuchi and Takayuki Kihara, Effective strong nullness and effectively closed sets, How the World Computes (CiE 2012), *Lecture Notes in Computer Science*, **7318** (2012), pp. 304–313.
5. Takayuki Kihara, A hierarchy of immunity and density for sets of reals, How the World Computes (CiE 2012), *Lecture Notes in Computer Science*, **7318** (2012), pp. 385–395.

Book Chapters

1. Zvonko Iljazović and Takayuki Kihara, Computability of subsets of metric spaces, to appear.

Unpublished Articles

1. Mathieu Hoyrup, Takayuki Kihara, and Victor Selivanov, On degree spectra of Polish spaces, in preparation.
2. Takayuki Kihara, and Victor Selivanov, Wadge-like degrees of Borel bco-valued functions, submitted.
3. Takayuki Kihara, The Brouwer invariance theorems in reverse mathematics, submitted.
4. Takayuki Kihara, Topological reducibilities for discontinuous functions and their structures, submitted.
5. Takayuki Kihara, Keng Meng Ng, and Arno Pauly, Enumeration degrees and non-metrizable topology, in preparation.
6. Paul-Elliot Anglès D'Auriac, and Takayuki Kihara, A comparison of various analytic choice principles, submitted.
7. Longyun Ding, Takayuki Kihara, Brian Semmes and Jiafei Zhao, Decomposing functions of Baire class 2 on Polish spaces, submitted.
8. Takayuki Kihara and Arno Pauly, Point degree spectra of represented spaces, submitted.

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