

# Leonardo Kawakami Pacheco

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Born: October 19, 1994

## Current Position

11/2024– Institute of Science Tokyo, Japan  
Post-doctoral Researcher

## Previous Position

05/2023– TU Wien, Austria  
10/2024 Project Assistant under supervision of Juan P. Aguilera

## Education

2020–2023 PhD in Mathematics at Tohoku University  
Thesis: Exploring the difference hierarchies on  $\mu$ -calculus and arithmetic — from the point of view of Gale–Stewart games  
Advisor: Keita Yokoyama

2018–2020 Master in Mathematics at Tohoku University  
Thesis: On the weak hierarchy of  $\mu$ -calculus  
Advisor: Kazuyuki Tanaka

2014–2017 Undergraduate in Mathematics at Universidade Federal de Goiás, Brazil

2012–2013 Undergraduate in Computer Science (incomplete) at Universidade Federal de Goiás, Brazil

## Complementary Education

2019 IMS Graduate Summer School in Logic at NUS, Singapore  
2016 IMS Graduate Summer School in Logic at NUS, Singapore

## Awards

2023 [Kawai Doctoral Thesis Award](#) from Tohoku University

## Teaching

2021 Teaching Assistant — 数学基礎論特論 (Mathematical Logic — Graduate)  
2021 Teaching Assistant — 計算機数学 A (Computability A)  
2022 Teaching Assistant — 計算機数学 B (Computability B)

## Publications

L. Pacheco, W. Li, K. Tanaka, *On one-variable fragments of modal  $\mu$ -calculus*, Proceedings of CTFM 2019, World Scientific Publications (2022), 17–45.

L. Pacheco, K. Tanaka, *The alternation hierarchy of the  $\mu$ -calculus over weakly transitive frames*, Proceedings of WoLLIC 2022 –28th Workshop on Logic, Language, Information and Computation, Lecture Notes in Computer Science, vol 12468, 207–220.

L. Pacheco, *Recent Results on Reflection Principles in Second-Order Arithmetic*, RIMS Kôkyûroku No.2228, 73–77.

L. Pacheco, K. Yokoyama, *Determinacy and reflection principles in second-order arithmetic*, preprint, [arXiv:2209.04082](#).

L. Pacheco, *The  $\mu$ -calculus' Alternation Hierarchy is Strict over Non-Trivial Fusion Logics*, to appear on the Proceedings of FICS 2024.

L. Pacheco, *Game semantics for the constructive  $\mu$ -calculus*, preprint, [arXiv:2308.16697](#).

J. Aguilera, R. Lubarsky, L. Pacheco, *Higher-Order Feedback Computation*, Proceedings of CiE 2024, Lecture Notes in Computer Science, 14773, 2024.

L. Pacheco, *Epistemic possibility in Artemov and Protopopescu's intuitionistic epistemic logic*, RIMS Kôkyûroku No.2293, 66–71, 2024.

L. Pacheco, *Collapsing Constructive and Intuitionistic Modal Logics*, preprint, [arXiv:2408.16428](#).

J. Aguilera, L. Pacheco, *IGL without sharps*, to appear on ACM Transactions on Computational Logic.

## Talks

- 2025 IGL *via*  $\omega$ -rules at [Logic Colloquium 2025](#).
- 2025 *On diamonds in constructive modal logic* at Conference on Non-Classical Modal Logics, National Taiwan University.
- 2025 *Collapsing Constructive and Intuitionistic Modal Logics* at [MSJ Spring Meeting 2025](#).
- 2025 *Topological Semantics for IS4* at [LLAL@GSIS \(VI\)](#).
- 2025 *The  $\mu$ -calculus' Alternation Hierarchy is Strict over Non-Trivial Fusion Logics* at [第 59 回 MLG 数理論理学研究集会](#).
- 2024 IGL *without sharps* at [E明論シンポジウム 2024](#).
- 2024 *Collapsing Constructive and Intuitionistic Modal Logics* at [Australasian Association for Logic 2024 Conference](#).
- 2024 IGL *without sharps* at [Wormshop 2024](#).
- 2024 *Higher-order feedback computation* at [Computability in Europe 2024](#).
- 2024 *Higher-order feedback computation* at [Logic Colloquium 2024](#).
- 2024 *Higher-order feedback computation* at [CCR2024: 17th International Conference on Computability, Complexity and Randomness](#).
- 2024 *Higher-order feedback computation* at [MSJ Spring Meeting 2024](#).
- 2024 *A constructive variation of GL* at [MSJ Spring Meeting 2024](#).
- 2024 *The  $\mu$ -calculus' Alternation Hierarchy is Strict over Non-Trivial Fusion Logics* at [Fixed Points in Computer Science 2024](#).
- 2024 *Higher-order feedback computation* at [Trends in Proof Theory 2024](#).
- 2023 *Epistemic possibility in intuitionistic epistemic logic* at [RIMS Workshop: New Frontiers of Proof and Computation](#).
- 2023 *Connecting reflection and beta-models in second-order arithmetic* at [Conference on Techniques from Logic in Mathematics](#).
- 2023 *Game Semantics for the Constructive  $\mu$ -calculus* at [15th Latin American Workshop on New Methods of Reasoning](#).



- 2023 *Towards a characterization of the  $\mu$ -calculus' collapse to modal logic* at [Australasian Association for Logic 2023 Conference](#).
- 2023 *The reverse mathematics of  $\omega$ -automata* at [若手による数理論理学研究集会](#).
- 2023 *The  $\mu$ -calculus' collapse on variations of S5* at [Logic Colloquium 2023](#).
- 2023 *Fixed-points in epistemic logic* at [MSJ Spring Meeting 2023](#).
- 2022 *The  $\mu$ -calculus collapses to modal logic over frames of IS5* at [Proof Theory Symposium 2022](#).
- 2022 *The alternation hierarchy of the  $\mu$ -calculus over weakly transitive frames* at [28th Workshop on Logic, Language, Information and Computation](#).
- 2022 *Determinacy and reflection principles in second-order arithmetic* at [Workshop on Reverse Mathematics and its Philosophy](#), joint presentation with Keita Yokoyama.
- 2022 *Determinacy and reflection principles in second-order arithmetic* at [The second Japan-Russia workshop on effective descriptive set theory, computable analysis and automata](#).
- 2022 *On the degrees of ignorance: via epistemic logic and  $\mu$ -Calculus* at [SOCREAL 2022](#).
- 2021 *Sequences of  $\beta_k$ -models and reflection in second-order arithmetic* at [Theory and Applications of Proof and Computation — RIMS 共同研究（公開系）](#).
- 2021 *On the  $\mu$ -calculus between S4 and S5* at [1º Enc\(ue-o\)ntro de Logica Brasil-Col\(o-ô\)mbia](#).
- 2021 *Modal semantics for epistemic logic* at [数学基礎論若手の会 2021](#).
- 2020  *$\mu$ -calculus and Wadge Degrees* at [Proof Theory Workshop 2020](#).

Last updated: July 15, 2025

Access at <https://www.leonardopacheco.xyz/cv.pdf>