

Aswedige Janitha Malith Fernando

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LinkedIn
Personal Website

RESEARCH INTERESTS

Foundations of Mathematics, Mathematical Logic, Model Theory, Modal Logic, Computability Theory, Probability Theory, Markov Chains, Computer Science, Semantics of Programming Languages, Abstract Model Theory, Order Theory, Set Theory.

EDUCATION

University of Hawai'i at Mānoa, Honolulu, Hawai'i, United States. 2024

Master of Arts, Mathematics

Thesis Title: A Monadic Logic for Capacity Quantifiers

Advisor: Prof. David Ross

Committee: Prof. David Ross and Prof. Bjørn Kjos-Hanssen

University of Colombo, Colombo, Sri Lanka. 2017

Bachelor of Science (Hons) Mathematics

Chemistry (Minor)

ACADEMIC EXPERIENCE

Project Numina

Contributor

2025-Present

- I work as a contributor to the Project Numina, where I use the Lean Theorem Prover to formalize mathematics.

University of Hawai'i at Mānoa

Graduate Assistant

2019-2023

- Conducted recitation classes for MATH 242 (Calculus 2), MATH 241 (Calculus 1), MATH 140 (Pre-Calculus), and MATH 100 (Survey of Mathematics).
- Instructor of record for MATH 241 (Summer Course).
- Prepared worksheets for MATH 241 and MATH 242.
- Proctored end of semester examinations and in-class quizzes.
- Graded homework assignments and end of semester exams.
- Held office hours.
- Proctored placement exams for various mathematics courses.

University of Colombo

Assistant Lecturer

2018-2019

- Conducted tutorial classes for Level I undergraduates in Differential Equations I and Graph Theory.
- Conducted tutorial classes for Level II undergraduates in Calculus II, Logic & Introduction to Analysis, and Linear Algebra.
- Worked as the Coordinator for Financial Mathematics courses FM 1002 and FM 2004 on differential equations and related topics.
- Worked as the Assistant Coordinator for Pure Mathematics.
- Acted as an invigilator for the end of semester examinations and in-class tests in the Faculty of Science.
- Participated in grading assignments, quizzes, examination papers of the department.

PROJECTS

University of Hawai'i

- *Abelian Squares - Class Project MATH 657 (Recursive Functions and Complexity)* 2020
I did a literature survey on a research problem on Abelian Squares found in Jeffrey Shallit's "A Second Course in Formal Languages."
- *Modal Invariance - Class Project MATH 654 (Introduction to Logic)* 2020
I gave a talk on Modal Invariance based on Johan van Benthem's "Modal Logic for Open Minds."

- *Formalizing some results related to ordered and unordered pairs in LEAN - Class Project MATH 654*
This was done as a group project for the final examination.

2020
- *The Natural Number Game in LEAN - Class Project MATH 654*
I completed all levels of the Natural Number Game and wrote a summary of it.

2020
- *Alpha Theory - Class project MATH 649B (Nonstandard Analysis)*
I discussed the paper “Alpha-theory: An elementary axiomatics for nonstandard analysis” by Vieri Benci and Mauro Di Nasso as the final presentation for the Nonstandard Analysis course. Here, I compared the super-structure approach with Benci and Di Nasso’s approach.

2021
- *Parking Functions and Labeled Trees - Class project Math 649J (Representation Theory)*
I did a literature survey on parking functions and wrote a report on it.

2021
- *Relevance and Detachment - MATH 699 (Modal Logic Reading Course)*
We dissected several notions of relevance in connection with holistic detachment in deontic logic studied in “How to Take Heroin (if at all). Holistic Detachment in Deontic Logic” by Van De Putte, Fritjers, and Meheus. This was done as a reading course in deontic logic with Prof. Bjørn Kjos-Hanssen and R.J. Reiff.

2021
- *Arithmetical Hierarchy - Class Project MATH 649B (Computability Theory)*
I gave a talk on the arithmetical hierarchy as a component of the final exam.

2022

University of Colombo

The following topics were covered for the independent reading module.

- Well-ordering Theorem.
- Polish Spaces.
- Diophantine Equations and $x^3 + y^3 = z^3$.
- Dorroh Extension Theorem.

TALKS

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| <ul style="list-style-type: none"> • <i>Filtrations and Finite Model Property of S5</i> • <i>Inference Rules for Probability Logic by Marija Borcic</i> • <i>A Monadic Logic for Capacity Quantifiers</i> | <p>University of Hawai’i Logic Seminar, Fall 2021</p> <p>University of Hawai’i Logic Seminar, Fall 2021</p> <p>University of Hawai’i, Master’s Thesis Defense</p> |
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SELECTED COURSES

Master's Courses

- MATH 654 Introduction to Logic
- MATH 657 Recursive Functions and Complexity
- MATH 699 Model Theory
- MATH 649B Nonstandard Analysis
- MATH 649B Computability Theory
- MATH 699 Modal Logic
- MATH 454 Set Theory
- MATH 455 Logic
- MATH 621 Algebra 1
- MATH 622 Algebra 2
- MATH 649J Representation Theory
- MATH 631 Theory of Functions of a Real Variable

Bachelor's Courses¹

- Calculus 1 & 2
- Vectors
- Linear Algebra
- Group Theory
- Ring Theory
- Fields and Galois Theory
- Commutative Algebra 1 & Category Theory
- Real Analysis 1 & 2
- Complex Analysis
- Measure Theory
- Functional Analysis
- Topology 1 & 2
- Topological Spaces
- Sets and Combinatorics
- Differential Equations 1, 2, & 3
- Graph Theory
- Geometry with Applications

Additional Courses

- MATH 699 Reading Course on Skolem's Problem of Exponential Functions
- MATH 699 Reading Course on Surreal Numbers
- MATH 699 Reading Course on Deontic Logic
- MATH 699 Reading Course on Model Theory
- MATH 699 Reading Course on Nonstandard Methods in Ramsey Theory and Combinatorial Number Theory

AWARDS AND HONOURS

Achievement Scholarship of \$800 for 2019-2020

Achievement Scholarship of \$800 for 2020-2021

Achievement Scholarship of \$250 for 2021-2022

Research Scholarship - Math Department \$4000 2023

Student Affiliate

Prize for the outstanding performance at the GCE A/L examination

Mrs. Iris and Mr. Chitty Scholarship for Mathematics in GCE A/L 2012

Prize for English Literature GCE O/L

Several pieces of poetry published in the Young Writers' Corner

University of Hawai'i at Mānoa
 University of Hawai'i at Mānoa
 University of Hawai'i at Mānoa
 University of Hawai'i at Mānoa
 East-West Center, Honolulu, Hawai'i
 St. Sebastian's College Moratuwa
 St. Sebastian's College Moratuwa
 St. Sebastian's College Moratuwa
 Ceylon Today

OTHER EXPERIENCES

- Organized an orientation session in math for incoming students University of Colombo, Sri Lanka
- Organized a problem-solving session for elementary school students University of Colombo, Sri Lanka
- Regularly contributed articles to the FOS Blog University of Colombo, Sri Lanka
- Conducted Training Sessions for Sri Lanka Mathematics Competition Sri Lanka Olympiad Mathematics Foundation
- Volunteer Sri Lanka Olympiad Mathematics Foundation
- Translated solution manuals to the English language Sri Lanka Olympiad Mathematics Foundation

¹Mentioned here are only the pure math courses.

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| • Performed at the East-West Fest | East-West Center, Honolulu, Hawai'i |
| • Volunteered at the Community Building Institute | East-West Center, Honolulu, Hawai'i |
| • Volunteered at The Exchange | East-West Center, Honolulu, Hawai'i |
| • Volunteered at the community garden project | East-West Center, Honolulu, Hawai'i |
| • Volunteered at the international potluck | East-West Center, Honolulu, Hawai'i |
| • Worked as a Freelance Teacher for the subjects of GCE O/L and GCE A/L Mathematics. | St. Sebastian's College,
Moratuwa, Sri Lanka |

ENGLISH TESTS

TOEFL (105)

Listening: 28 — Reading: 27

Speaking: 23 — Writing: 27

Test date: December 2018

SKILLS

- **Programming:** Knowledge in Python fundamentals, Numpy fundamentals and fundamentals of λ -functions in Python, basic knowledge in Java, and experience in working with the proof assistant LEAN.
- **Software:** Well-versed in Microsoft Office and L^AT_EX. Excellent skills in hosting online tutorials on Zoom.
- **Other Skills:** Excellent problem-solving and research skills, Adaptability, and Communication. Independent and Fast Learning ability.

REFERENCES

Professor David Ross

Professor, Department of Mathematics, University of Hawai'i at Mānoa, HI, USA

E-mail: ross@math.hawaii.edu

Professor Bjørn Kjos-Hanssen

Professor, Department of Mathematics, University of Hawai'i at Mānoa, HI, USA

E-mail: bjoernkh@hawaii.edu

Dr. Julia Kameryn Williams

Science, Mathematics, and Computing Faculty, Bard College at Simon's Rock, Great Barrington, MA, USA

E-mail: kwilliams@simons-rock.edu