

# Aswedige Janitha Malith Fernando

janitha@hawaii.edu.

## RESEARCH INTERESTS

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Foundations of Mathematics, Mathematical Logic, Model Theory, Abstract Model Theory, Descriptive Set Theory, Modal Logic, Computability Theory, Set Theory, Probability Theory.

## EDUCATION

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**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

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**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

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**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* 2020  
This was done as a group project for the final examination.
- *The Natural Number Game in LEAN - Class Project MATH 654* 2020  
I completed all levels of the Natural Number Game and wrote a summary of it.

- *Alpha Theory - Class project MATH 649B (Nonstandard Analysis)* 2021  
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.
- *Parking Functions and Labeled Trees - Class project Math 649J (Representation Theory)* 2021  
I did a literature survey on parking functions and wrote a report on it.
- *Relevance and Detachment - MATH 699 (Modal Logic Reading Course)* 2021  
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.
- *Arithmetical Hierarchy - Class Project MATH 649B (Computability Theory)* 2022  
I gave a talk on the arithmetical hierarchy as a component of the final exam.

## 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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| • <i>Filtrations and Finite Model Property of <math>S5</math></i> | University of Hawai’i Logic Seminar, Fall 2021 |
| • <i>Inference Rules for Probability Logic by Marija Boricic</i>  | University of Hawai’i Logic Seminar, Fall 2021 |
| • <i>A Monadic Logic for Capacity Quantifiers</i>                 | University of Hawai’i, Master’s Thesis Defense |

## SELECTED COURSES

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### 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 Courses<sup>1</sup>

- 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

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**Achievement Scholarship of \$800 for 2019-2020**

**Achievement Scholarship of \$800 for 2020-2021**

**Achievement Scholarship of \$250 for 2021-2022**

**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  
 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

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| • 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 |
| • Performed at the East-West Fest                                    | East-West Center, Honolulu, Hawai'i       |

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<sup>1</sup>Mentioned here are only the pure math courses.

- 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

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### TOEFL (105)

Listening: 28 — Reading: 27

Speaking: 23 — Writing: 27

Test date: December 2018

## SKILLS

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- **Programming:** Knowledge in Python fundamentals, Numpy fundamentals and fundamentals of  $\lambda$ -functions in Python, basic knowledge in Java, and experience in working with the proof assistant LEAN.
- **Software:** Well-versed in Microsoft Office and  $\text{\LaTeX}$ . 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

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### 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