T. KALPA MADHAWA

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QR code to open my teaching website

Education and Research

Southern Illinois University Carbondale IL USA (SIUC)

PhD in Pure Mathematics   July 2021

Interested in Algebra, Geometry and Topology. Mainly study, Clifford algebras and applications of Quaternions and Octonions in the field of Engineering, Computer Science and Quantum Physics.
Dissertation Title: Classification of Left Eigenvalues of Octonionic Hermitian Matrices.

Research works
- o Octonions and Rotations
- o Octonionic Eigenvalue Problem
- o Classification of Left eigenvalues of Octonionic Hermitian Matrices
- o Topics in Quaternion linear algebra
- o Quaternionic differential equation
- o Quaternionic Quantum mechanics
- o Equations in Quaternions and Octonions
- o Octonionic Mobius Transformation
- o Cayley-Hamilton Theorem for Octonionic Hermitian Matrices
- o Python Code for solving Quaternionic Quadratic Equations
- o Python Code for solving Octonionic Quadratic Equations
- o Introduced new python library(package) for Octonions (More information in my web page)

M.S. Mathematics   August 2017

- o Received my M.Sc. in Mathematics from the Department of Mathematics at SIU, under the supervision of Professor Jerzy Kocik.
  Master Thesis Title: Octonions and Rotations (Published)

University of Peradeniya, Sri Lanka (UOP)
B.S. Special Degree in Mathematics   January 2013
Minor: Computer Science and Physics
- o **Final Project:** Optimality Condition for approximate minima in minmax problems.

Summary of Teaching Qualification

Department of Mathematics, Southern Illinois University Carbondale

Graduate Teaching Assistant   Aug 2015 – Current

Teaching classes including preparing and grading tests, quizzes and assignments.

Grading assignments for 300 and 400 Level classes.

Meeting with students individually for tutoring, teaching intervention and maintain online grade book and course materials using D2L, Pearson's MyLab and Banner (Demonstrated excellent teaching instructions at SIU).

Classes Taught

- ❖ MATH 125, Technical Mathematics with Applications **Fall 2016**
- ❖ MATH 111, Precalculus **Fall 2017 and Summer 2019**
- ❖ MATH 108, College Algebra **Spring 2017**
- ❖ MATH 282, Introduction to Statistic **Spring & Summer 2018, Summer 2020**
- ❖ MATH 139, Finite Mathematics **Fall 2018, Spring 2020**
- ❖ MATH 140, Short Course in Calculus **Fall 2019**
- ❖ MATH 101, Introduction to Contemporary Mathematics **Summer 2017, Fall 2020**

Grading

- ❖ MATH 150 Calculus I
- ❖ MATH 483 Mathematical Statistics in Engineering and Sciences
- ❖ MATH 305 Introduction to Differential Equations
- ❖ MATH 250 Calculus II
- ❖ MATH 251 Calculus III
- ❖ MATH 221 Introduction to Linear Algebra
- ❖ MATH 282 Introduction to Statistic

Department of Mathematics, University of Peradeniya (UOP), Sri Lanka

Temporary Instructor **Aug 2014-July 2015**
Responsible for direct classroom teaching, conducting seminar, preparing, and grading quizzes and tests.

Temporary Lecturer **Feb 2014- Aug 2014**
Responsible for direct classroom teaching, preparing and grading assignments, quizzes, and tests.

Demonstrator/Tutor **Feb 2013 –Feb 2014**
Responsible for conducting tutorial classes and grading assignments.

Technical Skills

- Platform: Unix, Linux and windows
- Python, R, C++/C, SQL, MATLAB, Mathematica, Minitab, Octave, Maple, and Java
- Introduced new Python Package to do algebra in Octonions
- Proficiency in D2L, Pearson's MyLab, WebAssign, WeBWork, MyOpenMath and Banner

Awards and Conferences Talk

Outstanding PhD Teaching Assistant Award at Southern Illinois University Carbondale, **Apr 2019**
which is the most prestigious Ph.D. graduate teaching assistant award administrated
by Department of Mathematics at SIUC.

Conference speech at the Annual Meeting of the Illinois Section of the MAA,
Southern Illinois University, Carbondale. **Mar 29-30, 2019**

Associations and Memberships

- American Mathematical Society — **August 2015 - Current**
- Mathematical Association of America — **August 2015 - Current**
- Graduate Assistant United Southern Illinois University — **August 2015 - Current**
- Sri Lankan Students' Association Southern Illinois University – Secretary — **2018-2019**
- Captain of University Cricket Team — **2009-2012**
- Member of University Debate Team — **2008-2012**

Workshops and Voluntary Services

- "Expand your horizons" Conference for girls in 5th to 9th grades to choose their career choices — **2016- Current**
- Judge for the annual IJAS Region Science Fair at Southern Illinois University Carbondale — **2016- Current**
- "Math Field Day", for regional high school students. Schools from the southern part of Illinois, ranging from Edwardsville to Massac Country participate. — **2016- Current**
- American Mathematical Society (AMS), we organize AMS chapter meetings every Fridays and present seminar/talks to undergraduate and graduate students. At the end of each semester we arrange a workshop called "integration bees", which is a competition for undergraduate students to check their ability of Integration
- Completed a graduate portfolio at the Center for Teaching and Learning Excellence at SIU — **August 2018**
- Active member of weekly math tools, Algebraic and Potpourri seminars at SIU — **2016 - Current**
- Organizing committee member "International Festival" at Southern Illinois University — **2016 - Current**
- Worked as a resource person at Science resource center, University of Peradeniya
  We organized workshops for high school students and motivate them towards science and technology — **2012-2013**

References

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