Chanaka D. Mapa

PhD in Applied Mathematics
Rensselaer Polytechnic Institute, Troy, NY

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🌐 Chanaka Mapa
 Github/Chanaka

OVERVIEW

I develop scalable algorithms for quantum many-body problems. My PhD focuses on coupled-cluster methods, efficient tensor operations, and convergence techniques for solving the electronic Schrödinger equation.

EDUCATION

Rensselaer Polytechnic Institute   Troy, NY, USA
 PhD in Applied Mathematics   2023 - 2028 (expected)
Advisor: Prof. Fabian M. Faulstich

Rensselaer Polytechnic Institute   Troy, NY, USA
MS in Applied Mathematics   2025
Advisor: Prof. Yangyang Xu

University of Peradeniya   Peradeniya, Sri Lanka
 BS in Mathematics   2022
Advisor: Prof. Athula A.I. Perera

PROFESSIONAL EXPERIENCE

Rensselaer Polytechnic Institute - Troy, NY   2023 - Present
Research assistant under Prof. Fabian M. Faulstich:

- Coupled-cluster doubles implementation in Julia.
- Linear scaling coupled cluster and perturbation theories in the atomic orbital basis.

Rensselaer Polytechnic Institute - Troy, NY   2023 - 2024
Teaching assistant for the following courses:

- MATH 1020: Calculus II
- MATH 2010: Multivariable Calculus and Matrix Algebra
- MATH 6800: Computational Linear Algebra (Graduate level)

Bank of Ceylon (BOC) - Minuwangoda, Sri Lanka   2017 – 2018
Trainee, Job Skills Development Program for School Leavers

- Gained practical experience in administrative and banking operations as part of a national employment initiative.

PUBLICATIONS

- Dilshan, M. M. C., and Perera, A. A. I. *Radio Mean Number of Pendant Graphs.* North American Academic Research (NAAR 2023).
- Dilshan, M. M. C., and Perera, A. A. I. *Chromatic Number Based on Incidence Colouring for Ladder Graph Family.* International Conference on Business Innovation – Mathematics Section (ICOBI 2023).
- Dilshan, M. M. C., and Perera, A. A. I. *Radio Mean Number of Pendant Graphs for Even Cycles with Odd Diameter.* Faculty Annual Research Session (FARS 2022).

- Dilshan, M. M. C., and Perera, A. A. I. *Radio Mean Number for Pendant Graphs.* Science Undergraduate Research Symposium (SURS 2022).
- Dilshan, M. M. C., and Perera, A. A. I. *Radio Mean Number of Pendant Graphs for Odd Diameter.* International Conference on Applied Sciences (ICAPS).
- Dilshan, M. M. C., Kapuhennayaka, S., and Perera, A. A. I. *Odd Harmonies Labelling for Ladder Graphs.* International Conference on Mathematics and Mathematics Education (ICMME 2023).
- Dilshan, M. M. C., and Perera, A. A. I. *Incidence Coloring of Star Graphs.* International Conference on Mathematics and Mathematics Education (ICMME 2023).
- Dilshan, M. M. C., and Perera, A. A. I. *Graph Labeling and Harmonies: Odd and Even Labeling of Star Graphs.* Peradeniya University International Research Sessions (iPURSE 2023).
- Dilshan, M. M. C., and Perera, A. A. I. *Chromatic Number Based on Incidence Coloring for Cycles.* Annual Research Session (ARS 2023).
- Dilshan, M. M. C., and Perera, A. A. I. *Parity Constraints in Graph Labelings: Investigating the Incompatibility of Odd Harmonies in Graphs with Odd Loops.* Faculty Annual Research Session (FARS 2023).

Skills and Languages

- **Programming:** Proficient in Julia, Python, MATLAB, HTML, CSS, JavaScript, Bash scripting; experienced with Git and Linux-based HPC environments.
- **Software/Tools:** Familiar with scientific computing packages such as PySCF, PwSCF, and Psi4; experienced in job scheduling and submission using SLURM.
- **Languages:** Sinhala (native), English (fluent), Tamil (intermediate).

Relevant Coursework

Rensselaer Polytechnic Institute, Department of Mathematical Sciences, Physics, and Computer Science.

- Math 6800: Computational Linear Algebra
- Math 6890: Mathematical Foundations of Modern Quantum Many-body Theory
- Math 6820: Numerical Solution of ODEs
- Math 6620: Perturbation Methods
- Matp 6610: Computational Optimization
- Matp 6600: Introduction to Optimization
- Phys 6510: Quantum Mechanics I
- CSCI 1200: Data Structures

Leadership and Service Activities

Rensselaer Polytechnic Institute - Troy, NY   2025 - Present
Founding Chair - Math Frontier Seminar:

- This seminar focuses on numerical methods with an emphasis on applications.