

# Chanaka D. Mapa

PhD in Applied Mathematics  
Rensselaer Polytechnic Institute, Troy, NY

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🌐 Chanaka Mapa  
🐙 Github/Chanaka

## OVERVIEW

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I develop scalable algorithms for quantum many-body problems. My PhD focuses on coupled-cluster methods, efficient tensor operations, and convergence techniques for achieving linear coupled-cluster.

## EDUCATION

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### Rensselaer Polytechnic Institute

PhD in Applied Mathematics

*Advisor:* Prof. Fabian M. Faulstich

Troy, NY, USA

2023 - 2028 (expected)

### Rensselaer Polytechnic Institute

MS in Applied Mathematics

*Advisor:* Prof. Yangyang Xu

Troy, NY, USA

2025

### University of Peradeniya

BS in Mathematics

*Advisor:* Prof. Athula A.I. Perera

Peradeniya, Sri Lanka

2022

## PROFESSIONAL EXPERIENCE

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Rensselaer Polytechnic Institute - Troy, NY

2023 - Present

### Research assistant under Prof. Fabian M. Faulstich:

- Collaborated with IBM on “Benchmarking Quantum Chemistry”.
- Derived and implemented coupled cluster theory in an arbitrary gauge.
- Re-derived and implemented coupled cluster theory in Julia.

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

## AWARDS

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- Founders Award of Excellence, RPI

Fall 2025

## PUBLICATIONS

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- 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

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- **Programming:** Proficient in C++, Julia, Python, MATLAB, HTML, CSS, JS; experienced with Git , Linux-based HPC environments, and Quantum computing.
- **Software/Tools:** PySCF, PwSCF, and Psi4
- **Languages:** Sinhala (native), English (fluent), Tamil (intermediate).

## RELEVANT COURSEWORK

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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

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Department of mathematical sciences, RPI

- Founding Chair - Math Frontier Seminar 2025 - Present

Society of Industrial & Applied Mathematics (SIAM), RPI

- Graduate Representative Fall 2025