Iman Ebrahimi

+46 76 079 5521 — iman.ebrahimi.4250@student.lu.se — imanebrahimi99.github.io/

Summary — Motivated undergraduate mathematics student at Lund University with a strong foundation in theoretical and applied mathematics. Passionate about partial differential equations, dynamical systems, and their applications in physics and engineering. Proficient in mathematical modeling, programming, and academic writing. Dedicated to advancing knowledge in mathematical physics and stability theory through innovative research and interdisciplinary collaboration.

Skills

Technical: Proficient in MATLAB, Python, C/C++, Java and LaTeX for mathematical modeling and documentation. Experienced in working with differential equation solvers and stability analysis tools.

Languages: Persian (Native), English (Native/Bilingual), German (Fluent, CEFR Level C2), Swedish (Basic)

Education

Lund University **2021 - Present**
Bachelor of Science in Mathematics (Language of Instruction: English) *Ongoing since September 2024*
Minors: 30 ECTS in Theoretical Physics

Certifications

- TESOL - 120-Hour TESOL/TEFL Certificate
- IELTS - Latest Overall Score 8.5 (Speaking 9.0, Reading 7.5, Listening 9.0, Writing 7.5)

Research Interests

- Partial Differential Equations and their applications in Fluid Mechanics
- Dynamical Systems and Stability Theory
- Mathematical Physics and The Schrödinger Equation
- Mathematical Biology

University Assignment Projects

Here are a few selected projects from among the many that I have completed

Research Projects

- **An Exposition about Vectors, Bases, and Coordinates in Three-Dimensional Space**: A popular science writing project explaining fundamental concepts in vector spaces and coordinates in 3D space.
- **ElGamal Cryptosystem: A Study of Public-Key Encryption and Digital Signatures**: Conducted an in-depth report and implemented the ElGamal cryptosystem in Python, exploring public-key encryption and digital signature algorithms.
- **Algorithm Development in the Study of Stirling Numbers**: Investigated Stirling numbers related to discrete mathematics, developing efficient algorithms for their computation.
- **Wrote Lecture Notes on Boundary Value Problems and ODEs**: Compiled comprehensive lecture notes on boundary value problems (BVPs) and ordinary differential equations (ODEs) for educational purposes.

Coding Projects

- **Newton Fractals Visualization Using Python**: Created visual representations of Newton fractals, exploring the intricate dynamics of Newton's method for complex roots.
- **Computation of Integration, Curves, Surface Integrals, Directional Derivatives, Optimization, Gradients, and Implicit Functions Using Python**: Implemented various mathematical algorithms in Python to compute integrals, gradients, and other key concepts in calculus and optimization.
- **Computation of Least Squares, Normal Equations, and Minimization Using Python**: Developed Python code to solve least squares problems, focusing on normal equations and optimization techniques.

- **Simulation of Eigenvalues, Eigenvectors, and Recurrence Relations in Linear Algebra Using Python**: Implemented simulations of eigenvalue/eigenvector problems and recurrence relations, applying linear algebra concepts computationally.
- **Visualizing Quadratic Curves and Surfaces Using Python**: Developed visualizations for quadratic curves and surfaces, providing insight into their geometric properties.
- **Automating Problems in Probability Theory and Statistical Inference Using R**: Automated key concepts in probability and statistical inference using R, facilitating efficient analysis of data and probabilistic models.

Volunteer Work

- **Note-taker, Disability Support Services, Lund University:** Provided high-quality notes for the following courses and supported students with accessibility needs by ensuring clarity and precision in notes.
  - MATC12 Ordinary Differential Equations (Autumn Semester 2023)
  - MATP33 Group and Ring Theory (Spring Semester 2024)

Extracurricular Activities

- **Journalism:** Published articles focusing on cultural and historical topics in Rahavard Journal of Iranian Studies (Los Angeles, California).
- **Music:** Playing violin since the age of 4; performed in multiple orchestras and solo recitals.
- **Creative Writing:** Authored and published short stories in Persian.