Joel Sleeba

sleeba21@iisertvm.ac.in
joelsleeba.github.io
JoelSleeba
joelsleeba

About Me

I am a 2^{nd} year masters student in mathematics at the Indian Institute of Science Education and Research, Thiruvananthapuram and I am doing my master's project on **Fourier analysis** under the guidance of Dr. P Devaraj. I am broadly interested in **Harmonic Analysis and Operator Theory**. I am also passionate about open source software and a proud Linux user.

Education

2021–2023 **M.Sc Mathematics**, *IISER Thiruvananthapuram*, GPA: 8.38
Relevant courses: Functional Analysis, Measure Theory, Topology, Abstract Algebra, Analysis on Manifolds, Finite Frames, Represenatation Theory, Machine Learning

2018–2021 **B.Sc Mathematics**, *Madras Christian College*, Chennai, GPA: 8.03
Relevant courses: Real Analysis, Algebra, Linear Algebra, Number Theory, Discrete Mathematics

Research Experience

Research Intern

Supervisor Dr. P Shankar
Institute Cochin University of Science and Technology

Master's Thesis

Title A Study in Fourier Analysis: From Circle, Through the Line, to the Complex
Supervisor Dr. P Devaraj
Institute IISER Thiruvananthapuram
Description Learned about Fourier series, convergence of Fourier series, Fourier transforms in $L^1(\mathbb{R})$ and $L^2(\mathbb{R})$. I also understood classical Paley Wiener theorems and surveyed problem no. 4 from *Some Problems in Harmonic Analysis*. Readings:

- *Early Fourier Analysis*, Hugh L. Montgomery
- *Real and Complex Analysis*, Walter Rudin
- *Some Problems in Harmonic Analysis*, 2017, Grafokos et al.

Summer Schools

2021 April – 2021 May **Mathematics Training and Talent Search**, *Online*
Participated in level 1 of the national annual summer camp hosted by MTTS trust.

2020 May – 2020 June **Mathematics Training and Talent Search**, *Online*
Participated in level 0 of the national annual summer camp hosted by MTTS trust.

Achievements

2021 **Rank 1**, *M.Sc mathematics entrance examination*, Pondicherry University

2021 **Rank 3**, *M.Sc mathematics entrance examination*, Hyderabad Central University

Skills

Scripting **Python, Bash**
Python Libraries: Matplotlib, Scikit, Numpy
Bash: Task automation in Linux

Programming **C, C++, Java**
C: Algorithms involving pointers and structures
C++, Java: Object Oriented Programming paradigm

CAS **MATLAB, GNU Octave, Maxima, SageMath**
MATLAB,Maxima: Basics as part of Coursework.
GNU Octave, SageMath: Introductory knowledge

Markup *LaTeX*, **Markdown, HTML**

Languages **English, Malayalam, Tamil, Hindi**
Native proficiency in English and Malayalam. Elementary proficiencty in Tamil and Hindi.

Additional Courses

2020 July – 2020 Dec **CS101.2x: Object-Oriented Programming**, *IITBombayX*, MOOC, A+
Instructors: Prof. Deepak B Phatak, Prof. Supratik Chakraborty
Topics: Object Oriented Paradigm, Algorithms in OOP

2020 July – 2020 Dec **CS101.1x: Programming Basics**, *IITBombayX*, MOOC, A+
Instructors: Prof. Deepak B Phatak, Prof. Supratik Chakraborty
Topics: Syntax and basic algorithms in C++

Teaching

2021 Sep – 2021 Oct **Mentor**, *Online Foundation Course in Mathematics*, MTTS Trust
Cleared doubts and guided discussions for first and second year undergraduates.

Projects

2022 Sep – 2022 Nov **Math Modelling**, *The International Genetically Engineered Machine competition (iGEM)*, IISER Thiruvananthapuram
Modelled vesicle internalization for a breast cancer drug delivery system. The model can be accessed here.

2022 Sep – 2022 Nov **Web Developement**, *The International Genetically Engineered Machine competition (iGEM)*, IISER Thiruvananthapuram
Developed the team webpage. The website can be accessed here.

2021 January **XOR encryptor**
Developed a python script that can encrpyt any file or text using a key or password. The repository can be accessed from here.

2020 May **CSSart**
Developed a series of websites using CSS and HTML. The website can be accessed here.