

Joel Sleeba

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Education

Master of Science in Mathematics

Indian Institute of Science Education and Research — GPA: 8.38/10

October 2021 – May 2023

Thiruvananthapuram, Kerala

- Relevant coursework: linear algebra, functional analysis, topology, measure theory, probability theory, machine learning

Bachelor of Science in Mathematics

Madras Christian College — GPA: 8.04/10.0

June 2018 – May 2021

Chennai, Tamil Nadu

- Relevant coursework: linear algebra, real analysis, complex analysis, abstract algebra

Research Experience

Extendibility of Positive Maps

October 2023 – Present

Research Project

Dr. P Shankar, Prof. M N N Namboodiri, CUSAT

- Exploring the attempts to generalize Arveson's extension theorem to positive maps on operator systems.
- Currently reading *Counterexamples to the Extendibility of Positive Unital Norm-One Maps*, Chiribella et al. and .
- Learned about completely positive maps, Choi's theorem, and Steinspring dilation theorem.
- References: *Completely Bounded Maps and Operator Algebras*, Vern Paulsen and *Completely Positive Maps on Complex Matrices*, Man-Duen Choi

Introduction to C* Algebras

June 2023 – Sept. 2023

Summer Reading Project

Dr. P Shankar, Cochin University of Science and Technology (CUSAT)

- Learned the basics of Banach and C* algebras, Gelfand transforms, functional calculus, sesquilinear forms, GNS constructions.
- References: *C* Algebras and Operator Theory* by Gerard Murphy and *An Invitation to C* Algebras* by William Arveson.

A Study in Fourier Analysis

January 2023 – May 2023

Masters Thesis

Dr. P Devaraj, IISER Thiruvananthapuram

- Learned about Fourier transforms in the circle and line, ℓ^p convergence of Fourier series, Fourier Inversion, and classical Paley Wiener theorems
- References: *Early Fourier Analysis* by Hugh L Montgomery and *Real and Complex Analysis* by Walter Rudin.
- [Read my report on GitHub](#)

Workshops

Mathematics Training and Talent Search (MTTS) | Level 1 Summer Camp

April 2021 – May 2021

- Participated in the online summer camp hosted by MTTS trust, funded by the National Board of Higher Mathematics.
- Helped revise concepts in group theory, real analysis and linear algebra.

Mathematics Training and Talent Search (MTTS) | Level 0 Summer Camp

May 2020 – June 2020

- Gained a deeper understanding of topics including logic, sequence and series, vector spaces.
- The programme promoted active discussions in mathematics and gave a platform to connect with people passionate about mathematics.

Additional Courses

CS101.2x: Object-Oriented Programming

July 2020 – Dec. 2020

Grade: A+

MOOCs Course, IITBombayX

- Learned about the object oriented programming paradigm
- Implemented OOP in C++

CS101.1x: Programming Basics

July 2020 – Dec. 2020

Grade: A+

MOOCs Course, IITBombayX

- Learned the basics of programming in C

Projects

T_EX- Click

Dec. 2023 – Present

Firefox Addon

- Currently developing a Firefox addon to easily extract T_EX from the equations on websites including arXiv, Wikipedia, and StackExchange.
- [Get the addon](#)

Math Modelling

Sept. 2022 – Nov. 2022

Volunteer

The International Genetically Engineered Machine competition (iGEM), IISER Thiruvananthapuram

- Modelled the partial differential equations for the internalization of vesicles through cell membrane.
- [Access the model here](#)

Web Development

Sept. 2022 – Nov. 2022

Volunteer

The International Genetically Engineered Machine competition (iGEM), IISER Thiruvananthapuram

- Helped develop the team website which used python's static site builder, frozen-flask
- [Access the webpage](#)

XOR Encryptor

Jan. 2022

Developer

- Developed an encryption program capable of encrypting text and binary files with a keyfile or password.
- [Access the repository](#)

CSSart

May. 2020

Developer

[Website](#)

- Created a handful of webpages as a part of learning CSS.

Technical Skills

Programming

Python, C, C++, Julia

- Proficiency in working with Python, C, and C++.
- Basic working knowledge of Julia.

System Administration

Linux

- Over five years of experience using Linux.
- Proficient in network configuration, driver configuration, package management, and troubleshooting.

Database Management

SQL

- Have worked with mySQL as part of course curriculum.
- Currently manages an SQLite database for history in Zathura document viewer.

Markup

T_EX, Markdown, HTML, CSS

- Basic working knowledge in HTML, Markdown, and CSS.
- Developed a thesis template for IISER Thiruvananthapuram.
- [Access the template here from overleaf](#)