# Paarth Iyer

**Curriculum Vitae**

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paarth314.github.io

## EDUCATION

**Master of Science (Computer Science)** Aug 2022 - June 24*
Chennai Mathematical Institute CGPA : 9.5
*Proposed Master's thesis* : Image generative models
*Advisor* : Asst. Prof. Pranabendu Mishra

**Bachelor of Mathematics (Hons.)** July 2019 - May 22
Indian statistical Institute, Bangalore 87.2%

## RELEVANT COURSES

**Computer Science**
Advanced ML, Foundations of ML, Data Mining and ML, Natural Language Processing, Information Retrieval
*Other courses :* Algorithms, Haskell, Programming Language Concepts, Theory of Computation, Concurrent Programming

**Mathematics**
Statistics, Probability Theory, Linear Algebra, Multivariate Calculus
*Other courses :* Mathematical Logic, Analysis, Differential Geometry

## PROJECTS and RESEARCH EXPERIENCE

**Diffusion Models** Summer 2023 - Ongoing
Read and implemented papers relating to the diffusion generative process in order to understand the topic and the advancements in the methods and the model architecture used. This included the paper by Sohl-Dickstein, the DDPM paper, improvements in sampling and training, latent-diffusion models and methods to control the output of such models like ControlNet. This also acted as a part of the literature reading for the pre-thesis preparations.

**StyleGAN3 and DragGAN** Summer 2023
Went through the StyleGAN3 architecture and the techniques used in order to understand the improvements it introduces over StyleGAN2. This also involved discussing some possibilities of how the structure and the details of the generated image are affected when the input vector is changed. DragGAN allowed us to do structural manipulation and look at how each layer of the generator may change the structure of the entire image. The results were also compared against DragGAN on StyleGAN2.
*Instructor* : Asst. Prof. Pranabendu Mishra

**Testing Robustness of NNs against adversarial attacks** Sept 2023
Used the FGSM adversarial attack on pretrained classification networks to alter the correctly classified images to try and make them be classified incorrectly by the model by making changes barely noticeable to the human eye. Different models trained on different datasets were tested to determine how much an image is to be altered to give the desired result.
*As a part of the Advanced Machine Learning course*

**Word game on the blockchain** Nov-Dec 2022
Created a word game and deployed it on a local blockchain as a proof of concept. This included a functioning front end on the browser connected to the blockchain using MetaMask.
*As a part of the Intro to Blockchain course*

**Retrieval system using NER tagging** Fall 2022
Created a retrieval system that tagged entries with a pretrained NER tagger during indexing. These tags were subsequently utilized during retrieval to enhance results when entities are mentioned. Solr was employed as the backend for indexing and retrieval, while Python was utilized for tagging and automating the indexing process.
*As a part of the Information Retrieval course*

## ACHIEVEMENTS

- Recipient of Sriram Scholarship Aug 2022 - ongoing
- IIT-JAM 2022 Mathematics All India Rank 45
- IIT-JAM 2022 Statistics All India Rank 66

## TECHNICAL SKILLS

**Programming Languages**
Python (ML framework : Pytorch), C++, R, Julia, Haskell

*Web framework :* SvelteKit, Tailwind

## EXTRA-CURRICULAR ACTIVITIES

**Tessellate 2024 website and design** Sept 2023 - Jan 24
Created the Tessellate 2024 website and the backend to handle registrations for Tessellate events and STEMS 2024.

**Tessellate 2023 design** Oct 2022 - Jan 23
Was a part of the design team for Tessellate 2023 and STEMS 2023. Tessellate is an annual college fest conducted by students of CMI. STEMS is an online Olympiad conducted as a part of the fest.

**LIMIT 2021 design** Early 2021
Was a part of the design team for LIMIT 2021. LIMIT is an annual online Olympiad conducted by the students and research scholars of ISI Bangalore.