

# Sai Mitheran J

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## EDUCATION

### NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

B.Tech in Electronics and Communication Engineering (GPA: 9.76/10) w/ minor in Computer Applications

Tiruchirappalli, India

Jul 2018 - May 2022

### YUVABHARATHI PUBLIC SCHOOL (YBPS)

Engineering Stream

Coimbatore, India

March 2018

## EXPERIENCE

### AI MONK LABS PVT.LTD

Deep Learning Engineer (Intern)

Bengaluru, India

September 2020 -

• Building **neuralmarker.ai**, implementing SOTA models, using Pose Estimation, Segmentation, Object Detection and OCR, where the public can access pre-trained models, to annotate their own data.

• Implemented **FAIR's Detectron2**, **Open-MMLab's mmdetection**, **Retinaface**, **Mask-RCNN**, **YOLO-Series**, **TextBoxes++**, **EasyOCR**, **ViT**, and **DensePose**.

• Incorporating models with Video Annotation Support on **neuralmarker.ai**.

• Wrote a PyTorch Pipeline for **Superpoint** and **Alphapose**, for single image detection, and submitted on **paperswithcode.com**

• Gained experience of using cloud services such as **MongoDB Cloud** and **AWS**.

### ADVANCED GEOMETRIC COMPUTING LAB (IIT - MADRAS)

Undergraduate Research Intern

Chennai, India

December 2020 - February 2021

• Developed a retrieval system for **3D CAD models** using deep learning. Collected 3D CAD models from the available CAD databases, and prepared a dataset of sketches called '**CADSketchNet**', which will be made available online.

• Built a novel **Search engine** for CAD models using our proposed algorithm. Performance of the proposed system is shown to be better than other approaches, using **CADSketchNet**.

• Submitted a paper to the **CCF CAD/Graphics '21** conference, currently under review.

### PATTERN RECOGNITION LAB (NIT - TRICHY)

Undergraduate Research Intern

Tiruchirappalli, India

August 2020 - December 2020

• Developed an **Optimized Wireless Communication System**, using an ensemble **Conditional GAN** in efficient channel transmission.

• Designed an **Encoder-Decoder System**, to design a communication system and experimented models with **Multi-Headed Attention** to optimize channel modelling.

• Modelled **Lossless** channel transmission in non-terrestrial fields to reduce signal losses.

### IMAGE PROCESSING LAB (NIT - TRICHY)

Undergraduate Research Intern

Tiruchirappalli, India

February 2020 - April 2020 (On-hold)

• Worked on **Enhanced Fundus Imaging**, to improve the **Local Contrast and Luminance** in Images of the Eye

• Implemented the **Discrete Wavelet Transform**, and implementing the **Curvelet Transform** as a part of the algorithmic approach to aid ophthalmologists, in easier **detection of Exudates**

• To design and demonstrate a **Deep Learning** Approach, incorporating a **U-Net** Like Structure to perform the same task with higher accuracy.

### IGNITUS - LMS

ML and CV Freelancer

June 2020 - August 2020

• **Machine Learning** contributor (part of the **NLP and Computer Vision** Stream) to creating a **Learning Management System**, collaborating with engineers and researchers all over the world.

• Developed a **Pipelined Pandas architecture** to ensure the avoidance of Learning Disengagement, with a functionality for **Interactive Chatbots** and an engaging UI.

• Incorporated **Eye Gaze Tracking**, using responsive **JavaScript**, along with various other CV functionalities to ensure active learning.

### RISE LAB (IIT - MADRAS)

Cryptography and VLSI Intern - Shakti Microprocessor - India's First RISC-V Processor

Chennai, India

April 2020 - June 2020

• Gained experience in **Cryptography** and algorithms. Worked on implementing the different modes of the **AES Algorithm** for encryption, to be implemented in a **Hardware Accelerator**, for the **Shakti Microprocessor**.

• Designed an optimized algorithm using **BlueSpec System Verilog** for reducing the LUT overhead using an efficient implementation of the **Sub-Byte stage** by sharing modules.

• Implemented the parallel computation of **Key Generation** and the **AddRoundKey** stage according to Key Length.

## RSMIPL (DIVISION OF FOXCONN TECHNOLOGIES)

### Research and Development Intern

Chennai, India  
December 2019

- Gained work experience in **Chip set design** and manufacturing (Until **Level - 10** of Xiaomi and Nokia Phones)
- Intensive study of **equipment** used in the process, and **analysis** for improvement in productivity
- Practical work experience with **IoT engineers**, and **Chip Design specialists**

## APPIN TECH LABS

### Machine Learning IPT

Coimbatore, India  
Jun 2019 - Jul 2019

- Worked on **Optimisation** of several basic **classification and regression** techniques, along with tree-based boosting.
- **Chatbot deployment** with well-tuned hyperparameters.

## PROJECTS

- **Optimization of a Search-And-Rescue bot**, called Jet-PR, using **Object Detection Algorithms**, and **SLAM mapping**. (On-Site, on hold due to COVID)
- **Modified A3C Algorithm** with LSTM to beat **Atari's Breakout**. [Code]
- AI to beat Zoom Corridor game using **Deep Convolutional Q Learning**. [Code]
- Implementation of **Attention is all you need** - Google Transformer. [Code]
- Self Driving Car using **Deep Q Learning**. [Code]
- AI Stock Market Trader - Bot. [Code]
- Generative Modelling Tasks, using GAN's, Conditional-GANs, and Cycle-GANs.
- Flask and Streamlit Web application Deployment of Deep Learning Classification Tasks.
- A novel interactive **Waveguide Visualizer** using Python, depicting the complex Electric and Magnetic Vector fields in **TE, TM, TEM modes**, for **Rectangular and Cylindrical waveguides**. Also supporting **Quasi-TEM** modes in Microstrip and Coupled Microstrip Lines. Presented to 100+ faculty of IITs and NITs in the **SPARC-2021 workshop on Metamaterial Antennas for Wireless Applications and Deep Learning Techniques**. Submitted to be published on **Microwaves101**. [GUI] [Documentation]

## SKILLS

- **Programming Languages:** Python, C++, C, SQL, HTML, CSS, JavaScript, R Programming
- **Deep Learning Frameworks:** PyTorch, TensorFlow, Keras, OpenCV
- **Engineering Software:** Vivado (Xilinx), Matlab, Keil Vision

## CERTIFICATIONS

- Machine Learning and Deep Learning Specialisation (NPTEL, Coursera – Deeplearning.ai)
- Web Development Bootcamp (Full stack development)

## POSITIONS OF RESPONSIBILITY

### FESTEMBER, NIT TRICHY:

#### Marketing Manager - Annual Cultural Fest

Tiruchirappalli, India  
Feb 2019 -

- Connected personally with over 50 with Professionals in the fields of **Marketing, Management, Corporate Social Responsibility and Education** and discussed the terms for potential sponsorship, having extensive soft-skill training.
- Made over **50 Sponsorship Proposals** for companies of different portfolios, including **FMCG, Chemicals, Realty, Education and Stock Brokerage**.

### PRAGYAN, NIT TRICHY:

#### Manager - Annual Techno-Managerial Fest

Tiruchirappalli, India  
May 2019 -

- Pragyan is an ISO 9001 20121 certified International Techno-management Organization of the National Institute of Technology, Trichy, India. As a manager in the Crossfire and Guest lectures team, my role included liaising with Guest speakers and Crossfire panelists to organize guest lectures and crossfire at every edition of Pragyan.

## SPORTS

- **National Sports Organization** - Committee Member
- Tennis Contingent of NIT Trichy
- Secured Second place in Tennis Men in Sportsfete'18 and Sportsfete'19- the inter department sports fest organized by NIT Trichy

## SOCIAL ACTIVITIES

### GAIA ORGANISATION :

#### Founding Committee

Coimbatore, India  
May 2015 - August 2017

- Planted a new forest called the 'Miyawaki Forest' in the unused barren land of a school campus and maintained it regularly as the saplings came to life, to promote greenery and reduce pollution.
- Visited 'Snehalaya for Animals' and donated the funds raised to help provide shelter to homeless stray animals, associating with 'Snehalaya Dog Shelter' to carry out the needful.