

# EMIL BIJU

Indian Institute of Technology Madras | EE17B071

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## EDUCATION

Program	Institution	%/CGPA	Year of completion
B.Tech- Electrical Engineering	Indian Institute of Technology Madras	9.66/10	2021
Class XII (CBSE Board)	Sri Chaitanya Techno School	96%	2017
Class X (CBSE Board)	Sri Chaitanya Techno School	10/10	2015

## PROFESSIONAL EXPERIENCE

### Microsoft

#### Data and Applied Scientist Intern

Hyderabad

May - July, 2020

- Was part of the Azure Global Engineering team working towards the development of FarmBeats, a cloud-based platform aimed at revolutionising data-driven agriculture.
- Worked on sequence modelling and image processing based Deep Learning solutions for Agriculture and Energy using multi-spectral geo-spatial data.
- Received a Full-time offer as a Data and Applied Scientist.

### General Electric

#### Data Scientist Intern

Bangalore

May - July, 2019

- Was part of the Digital Services Technology Team at the GE R&D Centre and worked on a cross team collaboration project aimed at optimising the product design improvement process by using Machine Learning and NLP to analyse service records.
- Applied for a U.S. patent on the novel method that was designed. The project was appreciated by multiple global leaders in GE.

## PUBLICATIONS

### Joint Transformer/RNN Architecture for Gesture Typing in Indic Languages

[Paper] [Webpage]

Guides: Prof. Mitesh Khapra, Prof. Pratyush Kumar

Jan-July, 2020

*International Conference on Computational Linguistics (COLING), 2020*

- Conceptualised and built a novel RNN based Deep Learning framework for decoding swipe-based text input for Indic language smartphone keyboards.
- Developed architectures for sequence-to-word conversion and transliteration to achieve state-of-the-art performance.
- Used the brain motor control principle of jerk minimisation to simulate swipe gesture inputs and curate datasets across 7 Indic languages for training the models.

### Vocabulary-constrained Question Generation using Rare Word Masking and Dual Attention

[Paper] [Slides]

✂ Awarded the Best Paper Honorable Mention | Self-guided

Nov '19-Apr '20

*ACM India Joint International Conference on Data Science & Management of Data (CODS-COMAD), 2021*

- Proposed a neural question generation framework that generates semantically accurate and context-specific questions using a small-size vocabulary.
- Formulated a novel approach to question generation that reduces memory and computational needs by separating the tasks of generating the skeletal question structure and identifying rare words for context-specific substitution.

## SCHOLASTIC ACHIEVEMENTS

- **NTSE Scholar:** Featured among the top 750 students of the country to be awarded the NTSE Scholarship by the Government of India.
- **KVPY Fellow:** Featured among the top 1500 students of the country to be awarded the KVPY fellowship by the Indian Institute of Science (IISc).
- **Branch Upgrade at IIT Madras:** Featured among the top 6 students of my batch who received a branch upgrade to B.Tech, Electrical Engineering at IIT Madras.
- **Joint Entrance Examination:** Secured an All India Rank of 2355 in IIT-JEE Advanced-2017 and 2474 in JEE Mains-2017.

## SKILLS AND INTERESTS

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- **Programming Languages:** Python, C, C++
- **Assembly Languages:** ARM, Verilog
- **Libraries:** Keras, TensorFlow, Numpy, NLTK, Matplotlib, scikit-learn
- Machine Learning, Deep Learning
- Natural Language Processing, Computer Vision
- Competitive Coding

## RELEVANT COURSEWORK

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- Introduction to Programming
  - Introduction to Machine Learning
  - Deep Learning
  - Internet of Things
  - Modern Computer Vision
  - Probability Foundations
  - Linear Algebra
  - Digital Signal Processing
  - Digital Systems
  - Computer Organization
  - Analog Systems
  - Electric circuits and networks
  - Microprocessors
- Online Courses:**
- Machine Learning (Coursera - Stanford University)
  - Deep Learning: Advanced NLP and RNNs (Udemy)

## OTHER KEY PROJECTS

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### **Multi-spectral Satellite Image Analysis for Biomass and Oil Prediction** Internship Project, Microsoft

*May-July, 2020*

- Developed a joint LSTM-Transformer Neural Network architecture to process satellite imagery and weather data for remote prediction of crop biomass on large-scale farms.
- Developed CNN-based Neural Network models for identifying prospective areas for oil exploration and curated a large-scale dataset to support my work and further research at Microsoft in this space.
- Conceptualised and developed a novel tree-based hierarchical data structure for xarray, an open-source Python package for processing high-dimensional arrays.

### **Reliability Process Optimization using Natural Language Processing** Internship Project, General Electric

*May-July, 2019*

- Developed an NLP algorithm to process large-scale service records of predicate products and identify areas for design improvements to enhance machine reliability.
- The algorithm efficiently identifies machine failure patterns, extracts key failure modes and predicts future failures with a 11x improvement in the amount of processable data as opposed to previously used methods.

### **Automated Signature Forgery Detection using Computer Vision** Computer Vision and Intelligence Club, IIT Madras

*May-July, 2018*  
[GitHub]

- Developed an algorithm to distinguish original and forged signatures using Deep Learning for automating bank verification processes through offline signature verification.
- Employed Computer Vision techniques based on a Siamese Convolutional Neural Network for enhancing accuracy.

### **Optimised RISC-V CPU Implementation** Computer Organization Course, IIT Madras

*July-Nov, 2019*  
[GitHub]

- Developed a RISC-V CPU with 5-stage pipeline in Verilog, optimised performance using branch prediction and exception handling and performed exhaustive verification of the functionality on an FPGA board.

## POSITIONS OF RESPONSIBILITY

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- **School Head Boy** *2014-15*  
Popularly elected by the school community, was responsible for heading the students' council and managing events
- **School Deputy Head Boy** *2012-14*  
Was popularly elected for 2 consecutive years and held responsibility for co-ordinating school activities.
- **Coordinator and Strategist - Extra Mural Lectures, IIT Madras** *2018-20*  
Hosted prominent personalities and collaborated with the team to organise IITM's flagship lecture series.
- **Project Team member - Computer Vision and Intelligence Club, IIT Madras** *2017-18*  
Was part of the SBI Stockroom project that was aimed at automating tasks in banks using Deep Learning.

## EXTRA-CURRICULAR ACTIVITIES

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- **Public Speaking:** Was the lead emcee for numerous events in school and college.
- **Blogging:** Created a blog to guide JEE aspirants based on my experiences [Visit [Passion JEE](#)].
- **National Cadet Corps:** Was part of the National Cadet Corps team of IIT Madras.