

SAMA SAI KARTHIK

International Institute of Information Technology, Bangalore

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Education

International Institute of Information Technology, Bangalore

August 2018 - Present

Integrated Masters degree in Computer Science

CGPA - 3.89/4.00

Work Experience

Media.net

May 2022 - July 2022

Data-Science Intern

Python, Flask

- Was part of a research group at media.net. Built a hierarchical locations corpus from Wikipedia dump. Wrote algorithm to detect locations from page URL.
- Goal : serve better keywords for ad publishers whenever location based information is found in URL content.

Heidelberg University & CIMH Mannheim

June 2021 - August 2021

Research Intern

PyTorch, Tensorboard

- Was part of theoretical Neuroscience group at CIMH Mannheim. Worked on improving the performance of a State Space model of brain constructed using Piece-wise Linear Recurrent Neural Networks(PLRNN).
- Studied use of Sequential Variational Autoencoders(SVAEs), in reconstruction of dynamical systems.

Indian Institute of Science, Bangalore

May 2021 - June 2021

Research Intern

Opensim, Javascript, Docker

- Was part of Visuomotor lab at IISc. Configured Opensim software and created a docker instance for it for reusability.
- Studied APIs of Opensim and implemented python scripts for controlling elements in a stimulation of motor control.
- Created animations to represent changing weights of neural network, during training using Javascript.

International Institute of Information Technology, Bangalore

May 2020 - July 2020

Research Intern

PyTorch, MOSES, MUSE, FastText

- Studied and experimented unsupervised techniques for Machine Translation for Indian Sign Language(ISL) project.
- Studied adversarial models, to explore their use when data is translation data is sparse.

Kharagpur Winter of Code

December 2019 - January 2020

Open-source Contributor

Django, Github, SQLite

- Open-source Blog Project : Developed forums for asking questions and blog sharing. Added option to tag blogs.

Academic Participation

Trustworthy AI workshop

January 5-6, 2023

- Participated in the Trustworthy AI workshop co-organized by Microsoft Research India, Wadhvani AI, and Penn.
- Selected among 50 students to attend the workshop in person. Co-presented a poster on Computational Transcendence.

Poster presentation at IConS of SCARF

August 25 - August 27, 2022

- Poster on Psych Care tool was accepted and presented at the International Conference of Schizophrenia, 2022.

CAMP (Computational Approaches to Memory and Plasticity)

July 23 - August 7, 2022

- Selected among 35 students to attend the summer school CAMP, organized by Prof. Arvind Kumar, Prof. Rishikesh Narayan, Prof. Upinder Bhalla. Was introduced to the breath and depth of computational neuroscience.

Projects

Computational Ethical agency modelling | *NetworkX, Matplotlib, Python*

- Co-developed the framework SPECTRA(Strategic Protocol Evaluation and Configuration Testbed for Responsible Autonomy), where in a given context different computational models of ethics can be simulated.
- Developed models for Utilitarian, Deontic, Virtue, Transcendence ethics. Work submitted for review at JAIR.

Coupling diverse Exponential Integrate and Fire Models | *Matlab, Java, Brian, Python*

- Studied different single neuron models like EIF, aEIF, CaDEx, FHN.
- Coupled neuron models using different methods, two contrast how they could influence qualitative behavior.

Modelling intrinsic motivation | *NetworkX, Matplotlib, Python*

- Modelled agents with different intrinsic motivations(power, achievement, affiliation) in a network of agents who play iterated Prisoners' Dilemma with their neighbours.
- Investigated what factors influence the stabilization of network(all agents receive payoffs as they intrinsically expect).

Psych Care | *Flask, D3.js, Scikit Learn*

- Built a web-based Visualization tool, *Psych Care*. Data for this work had been provided by Division of Digital Psychiatry at Beth Israel Deaconess Medical Center(Harvard Medical School affiliate) under the project *Digital Psych*.
- Applied multiple unsupervised learning methods on different data modalities to contrast & correlate patient behaviors.
- Visualized the results on a dashboard with two panels. Each panel with visualization, made comparative analysis easier.

Santander Product Recommendation | *scikit-learn, pandas, numpy*

- As part of Machine Learning course(AI-511), we predicted which bank products will be picked up or dropped off by the customers in the upcoming months based on their historical data.
- Explored data using visualizations, handled null values, tried out various traditional machine learning methods like Decision Trees, Support Vector Machines, Logistic regression. Used voting algorithms across best performing models.

Lyrics Inn | *Python, Genius lyrics API*

- Used Genius Lyrics API to retrieve lyrics(JSON objects) of song query. Used web scrapping methods to retrieve data.
- When multiple results are found, presented user with top choices to decide appropriate lyrics.

Teaching Assistance and Volunteering

Teaching Assistant

Fall semester 2022-23

Discrete Mathematics(CS-201)

IIT Bangalore

Led class discussions on tutorial problems. Developed questions for the examinations and evaluated them.

Teaching Assistant

Fall semester 2021-22

Mathematics for Machine Learning(AI-512)

IIT Bangalore

Led discussions and evaluated scripts for topics like Singular Value Decomposition, Power iteration methods.

Teaching Assistant

Fall semester 2019-20

Programming in C(ES-101)

IIT Bangalore

Taught tutorials for hands on experience of C programming language. Curated questions for exams and evaluated them.

Volunteer

October 2019

Ramanujan Math & IT Conference(RMIT)

IIT Bangalore

Organised the annual Math conference of the institute.

Technical Skills

Programming Languages: C, C++, Python, Matlab, Java, SQLite, MiniZinc, Bash, Javascript, Verilog, HTML, CSS
Technologies/Frameworks: GitHub, Flask, Django, Bootstrap, GDB

Relevant Coursework

- Programming in Python, C, Java, C++
- Fundamentals of Theoretical Neuroscience
- ML and Math for ML
- Reinforcement Learning
- Multi Agent Systems
- Data Visualization
- Probabilistic Graphical Models
- DBMS
- Network Science for the Web
- Non-Linear Dynamics
- Graph theory
- Technology Ethics and AI
- Causal Inference and Learning(current)

Massive Open Online Courses(MOOCs)

- Computational Neuroscience
- Machine Learning
- Neural Networks and Deep Learning
- Structuring ML Projects
- Improving Deep Neural Networks

Achievements Awards

Deans Merit List

2018-22

Mitacs Globalink Research Internship

2021-22

Selected, couldn't accept it due to other commitments

ACM-ICPC regionalist, Asia Amritapuri Site

2021-22

Team Rank - 492

EthOdyssey blockchain hackathon - Winners

2021

Team Depocalypse

Built a NFT marketplace

DAAD-WISE Virtuall Ackademy scholarship

2021

Indian Academy of Sciences summer fellowship

2021

EY Techathon National Finalist

2020

Team Chaos

Top 6 of 1000+ teams Nationwide

👉 All Olympiad achievements, Extra curricular activity achievements