Sama Sai Karthik

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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*

Experience

Media.net **May 2022 - July 2022**
Data-Science Intern *Python, Flask*

- As part of a industrial research group at media.net, building a location based corpus from Wikipedia dump and extracting locations from page URLs and its content
- End goal of this attempt would be to 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*

- As 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 Sequential Variational Autoencoders(SVAEs), Dynamical Systems reconstruction to understand and improve the existing model.

Indian Institute of Science, Bangalore **May 2021 - June 2021**
Research Intern *Opensim, Javascript, Docker*

- As part of Visuomotor lab at IISc, installed dependencies of Opensim software on a Linux system and exported it to a docker for ease of usage of software in future.
- Using APIs of Opensim produced scripts for controlling elements in 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.
- Learn adversarial models, which become handy when translation data between languages is sparsely available.

Kharagpur Winter of Code **December 2019 - January 2020**
Open-source Contributor *Django, Github, SQLite*

Added forums for asking questions, blog sharing functionality and option to tag blogs, in a open-source Blog Project.

Mentorship and Volunteering

Teaching Assistant **Fall semester 2022-23**
Discrete Mathematics(CS-201) *IIIT 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) *IIIT 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) *IIIT 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) *IIIT Bangalore*

Organised the annual Math conference of the institute.

Projects

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

- Studied different ethical schools of thought : Utilitarianism, Deontology, Virtue ethics.
- In a message passing network, developed agents based on each of this ethical principles which direct agents towards responsible behaviour.
- Developed an agent model of computational transcendence in the same setup.

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

- Studied different single neuron models like EIF, aEIF, CaDEx.
- Coupled these neuron models using gap junction, to explore qualitative changes in the system.

Modelling intrinsic motivation | *NetworkX, Matplotlib, Python*

- Autonomous agent value the same external rewards differently based on their intrinsic motivations.
- Modelled agents with different intrinsic motivations(power, achievement, affiliation) in a network of agents who play iterated Prisoners' Dillemma with their neighbours.
- Investigated what type of demographics lead to a stable network where every agent is satisfied.

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

- Built a web-based Visualization tool, *Psych Care*. The data for the project 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 make inferences on patient behavior.
- Visualized the results on a dashboard with two panels. Each panel can with a visualization, makes comparison easier.

Off to Mars | *Django, SQLite*

- Built a Django quiz interface from scratch, questions and their respective answers were managed through a database.
- The amount taken to give the quiz was timed, to break the tie in the leader board.

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.
- Data exploration through visual feedback, handling null values, tried various traditional machine learning methods like Decision Trees, Support Vector Machines, Logistic regression.

Lyrics Inn | *Python, Genius lyrics API*

- Used python web scrapping from JSON objects retrieved by querying Genius lyrics API to get lyrics of desired songs on the fly.
- The top 10 songs and their artists are displayed for user to pick if multiple query results found.

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
- Machine Learning(ML)
- Math for ML
- Reinforcement Learning
- Multi Agent Systems
- Data Visualization
- Database Management
- Probabilistic Graphical Models
- Network Science for the Web
- Non-Linear Dynamics
- Graph theory
- Technology Ethics and AI

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 Virtuell 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