Prishita Ray

Email | Github | LinkedIn | Google Scholar

PERSONAL STATEMENT

An avid programmer, researcher and deep learning enthusiast wanting to contribute towards research and development that addresses challenging real-world problems.

EDUCATION

01/2022 – 12/2022

Cornell University | Ithaca, NY, USA

Master of Engineering, Computer Science (spec. ML/AI)

Grade: 3.9/4.0 (Spring 2022)

Relevant Coursework: Mathematical Foundations of ML*, Introduction to Computer Vision, Autonomous Mobile Robots

MEng Project Title: ShadowSense** (advised by Prof. Guy Hoffman)

Labs: Human-Robot Collaboration and Companionship Lab

07/2017 – 06/2021

Vellore Institute of Technology | Vellore, India

Bachelor of Technology, Computer Science and Engineering

Merit Scholarship Awardee 2017-18 (9.6/10.0, Branch Rank 4)

Grade: 9.1/10.0

Relevant Coursework: Data Structures and Algorithms**, Natural Language Processing**, Compilers*, Databases**, Machine Learning*, Data Mining**, Networks*, Operating Systems*, Statistics*, Computer Architecture, Digital Logic and Design*, Theory of Computation*, Microprocessors*, Neural Networks

Thesis Title: Efficient renewable energy powered automatic water dam control system

Activities and Societies: IEEE Computer Society VIT Student Chapter, ACM VIT, VIT Music Club

* Received A Grade

** Received A+/S Grade for Exceptional Performance

SKILLS

- **Programming Languages:** Python, C, C++, Java, Matlab, R
- **Deep Learning:**
  Frameworks: TensorFlow, Keras, PyTorch, NLTK, IBM Watson
  Domains: Reinforcement Learning, Natural Language Processing, Computer Vision
- **Microcontrollers and Microprocessors:** Raspberry Pi, Arduino Uno, Intel 8086, Keil MicroVision, PIL, Assembly Language
- **Operating Systems:** Windows, Linux, Mac OSX
- **Web Development:** React Native, PHP, MongoDB, Flask, Android XML
- **Databases:** MySQL, SQLPlus, MongoDB
- **Languages:** English, French, Hindi, Bengali
- **Other Skills:** Management, Teamwork, Writing Skills, Teaching, Dance, Keyboard

RESEARCH EXPERIENCE

01/2022- Present

Master of Engineering Project | HRC2 lab, Cornell University, Ithaca, NY, USA

Advisor: Prof. Guy Hoffman

Working on a project called ShadowSense to track and classify motion of subjects and obtain inference about their behavior from highly distorted or fuzzy live captures, which adds a privacy-preserving element to home environments.

12/2020 – Present

Researcher | Carboncopies Foundation, California, USA

Currently working on developing the BrainGenix Project as an active researcher and NES division Lead to achieve whole brain emulation.

02/2021 – 06/2021

Undergraduate Capstone Project | Vellore Institute of Technology, Vellore, India

Advisor: Prof. Geraldine Bessie Amali D.

Created the prototype of a Real Time System that makes use of an intelligent scheduler SEPS to manage flooding in a water dam based on sensor readings. Ensured maximum usage of available renewable resources with lesser pollution.

12/2020 – 02/2021

Research Intern | Indian Space Research Organization, Bangalore, India

Advisor: Dr. Santhi V

Removed speckle (multiplicative) noise in Synthetic Aperture Radar (SAR) sentinel images using Neuro-fuzzy and Wavelet Transform techniques and evaluated the proposed model using the four metrics: Speckle Suppression Index (SSI), Equivalent Number of Looks (ENL), Speckle Mean Preservation Index (SMPI), and Peak Signal to Noise Ratio (PSNR).

12/2019 – 02/2021

Academic Research Project | Vellore Institute of Technology, Vellore, India

Advisor: Dr. Kakelli Anil Kumar

Performed multiclass classification of network intrusion malwares by extracting relevant features from log files of running processes in the web server system using variants of autoencoders and the FSFC Clustering algorithm. Used those features to classify each malware using limited labeled examples for training through Ladder Networks.

05/2019 – 07/2019

Summer Research Fellow | Stochastic Systems Lab, Indian Institude of Science, Bangalore, India

Advisor: Dr. Shalabh Bhatnagar

Proposed a Multi-Agent Reinforcement Learning solution for demand and supply management in Microgrids, using two DQN networks for scheduling of jobs (ADL Network) and trading energy (ET network) through a Dynamic Pricing scheme.

***NES Division Lead: BrainGenix, Carboncopies Foundation (2022)**

Serving as the lead of the Neuron Emulation System division at BrainGenix.

***Peer Reviewer: Journal of Network and Systems Management (2020)**

Served as a reviewer in their special issue for Cybersecurity management in the era of AI.

INDUSTRY EXPERIENCE

09/2021 – 01/2022

Associate ML Engineer | Harman X, Bangalore, India

Worked on the General Behaviour Model of their Hybrid Inference Engine, to analyze user behaviour from connected car data, which is then processed to provide app recommendations to the user.

05/2020 – 07/2020

Software Engineering Intern | VISA Inc. , Bangalore, India

Provided a contactless payment solution using VISA APIs for customers to avail services, and buy essential items from small merchants and service providers, using a multi-platform mobile app built with React, MongoDB, and Redux.

02/2020 – 06/2020

HPE CTY Program | Hewlett Packard Enterprise, Bangalore, India

Worked on a project to secure open-source components on containers such as Docker, Kubernetes, etc. by identifying CVE vulnerabilities, exploiting them and attempting to secure them based on various Operating Systems such as Debian, Ubuntu, etc.

10/2019 – 07/2020

Samsung PRISM Project | Samsung R&D Institute, Bangalore, India

Worked on an On-Device AI application of voice recognition, to segment and cluster different voice samples through experiments performed with an audio fingerprinting approach and a deep learning pipeline of autoencoders, RNNs and self organizing maps implemented in tensorflow.js.

NOTABLE OPEN-SOURCE PROJECTS

05/2020 – 08/2020

Student Developer, Google Summer of Code | FrameNet Brasil, UFJF, Brasil

Mentor: Prof. Tiago Timponi Torrent, Prof. Ely Edison Matos

Code: https://github.com/FrameNetBrasil/charon_gsoc2020

Worked as a student developer for the FrameNet Brasil Organization on my project- New Frame-Based Image and Video Annotation Pipeline for the FNBr Web Annotation Tool. The aim of the project was to design an automated annotation framework using identified objects and textual data from videos, with the core and non-core frame elements present in the FrameNet database.

PUBLICATIONS

CONFERENCE PROCEEDINGS:

A New Combined Model with Reduced Label Dependency for Malware Classification [code] [paper]
Published: 3rd International Conference on Integrated Intelligent Computing Communication & Security (ICIIC), Sep 2021

Stochastic Game Frameworks for Efficient Energy Management in Microgrid Networks [code] [paper]
Published: Innovative Smart Grids Technology (ISGT Europe), IEEE PES, Netherlands, Nov 2020

JOURNAL CHAPTERS:

Contemporary Developments and Technologies in Deep Learning based IoT [paper]
Published: Deep Learning for IoT Infrastructure, CRC Press, Taylor and Francis, Sep 2021

HONORS AND AWARDS

- **MEng CS- Top 5 performers (2022):** Among top 5 performers in the Master of Engineering CS Spring 2022 batch at Cornell University.
- **Best Paper Award (2021):** Best Paper Award awarded for the publication 'A New Combined Model with Reduced Label Dependency for Malware Classification' at the 3rd International Conference on Integrated Intelligent Computing Communication & Security (ICIIC) 2021.
- **Google Summer of Code (2020):** Selected to work with the FrameNet Brasil Organization on a project to design a New Frame-Based Video and Image Annotation Pipeline for the FrameNet Web Annotation Tool.
- **SRFP (2019):** Was granted the Summer Research Fellowship by the Indian Academy of Sciences (INSA), to work at IISc Bangalore, in the CSA department in the field of Reinforcement Learning, as one of the selected 350 students among ~30000 applicants.
- **Google India Challenge Scholarship (2018):** Was chosen among 10000 applicants for the Android Development Track on Udacity
- **VIT Merit Academic Scholarship (2018)**: Recipient of the VIT Academic Scholarship for exceptional academic performance 2017- 18
- **NTSE Scholarship (2015):** Secured 19th rank in Karnataka, for the National Talent Search Examination 2014 and received scholarship from the Government of Karnataka, India

PERSONAL AND ACADEMIC PROJECTS

Why Deep Learning Succeeds: Review on whether the number of parameters or backward feature correction can explain the superior performance of Deep Learning, completed for the Mathematical Foundations of ML course at Cornell University. [code]

Audio Classifier for Asthma Detection: This project classifies audio samples collected from patients in real time, including their cough, fluid levels and wheezing frequencies in real time to detect asthma and hypothorax conditions by using Tensor Stacked CNN architecture. [code]

Improving Linux Process Scheduling using ML: 2 Machine Learning (ML) techniques can learn the CPU time-slice utilization behaviour of known programs namely the Decision Tree algorithm and finding the

IB K-nearest neighbours that improves Turnaround Time of the Linux OS. This project was done as a part of the OS course by feeding dynamic and static process attributes to the WEKA tool. [report]

OCR via CNNs: A React web application with Flask Server to return the top 5 predicted characters similar to a character drawn in a selected language. (Used to decipher emergency messages) . The model implementation is done using Python. [code]

Dialog Segmentation and Emotion Recognition of Movie Subtitles: In order to aid blind and autistic patients who are not able to read movie subtitles and face a lot of ambiguity when trying to understand which actor is currently speaking in a scene as well as his or her associated emotions, an automatic speaker turn-based dialog segmentation system along with recognition of emotions has been implemented in this project. [code]

Motion Tracker using Colour Recognition: A Python Program using OpenCV that invokes the video camera and allows the user to select a color by controlling the levels of RGB from 0 to 255, using three trackbars. Once the color is selected , any motion with that colour can be tracked using the pixel positions. [code]

Analysis on Web crawling algorithms: Analyzing the time complexity and memory usage of 5 different web crawling algorithms , DFS, BFS , Page Rank Algorithm (used by Google), A Star Search and Adaptive A Star Search to crawl a network of websites based on the search query issued by the user. This project was done for the Data Structures and Algorithms course in C. [code]

Sentiment Analysis and Sentiment Polarity Categorization of Amazon Kindle Reviews Dataset: A sentiment analysis on the Amazon kindle reviews in Python using Naive Bayes Classification, Random Forest, and SVMs. [code]

Preventing double-spending attacks in cryptocurrency blockchains using network observers and peer-alert systems: This project prevents double-spending attacks in cryptocurrency blockchain transactions using network observers and peer alert systems [code]