

## EDUCATION

Program	Institution	%/CGPA	Year of Completion
M.Tech. CSE	Indian Institute of Technology Madras, Chennai	7.34	2019
B.Tech. CSE	Uttar Pradesh Technical University, Lucknow	63.04 %	2014
XII (AISSCE)	BBL Public School, Bareilly (CBSE)	88.40 %	2009
X (AISSE)	BBL Public School, Bareilly (CBSE)	86.40 %	2007

## PROJECTS

### • Retrieving Nutritional Information of Indian Cuisines

*Master's Thesis and Project*

- **Database Generation:** Multiple images of 400+ Indian Dishes, each considered as a separate class; Nutritional Information of each Indian Dish
- **Object Localization:** Recognition of Indian dish within an arbitrary input image
- **Quantity Estimation:** Finding quantity of an item from a given image

### • Ontologies

*Academic Projects*

- **Creating Custom APIs:** Custom APIs for fetching NEWS from various websites
- **Article Similarity:** Using Google NLP API to fetch keywords from an article and comparing the set of those keywords with that of others to compute the similarity between any two NEWS articles
- **APIs Vs SparQL Endpoints:** Fetching ingredients of any cuisine along with images of its ingredients, using SparQL endpoints, here Wikidata was used
- **Utilizing multiple SparQL Endpoints:** Amalgamating information retrieved from multiple SparQL endpoints to produce meaningful results

### • Wireless Communication

*Implemented two 5G protocols for beam communication*

### • Deep Learning

*Academic Projects*

- **Image Classification:** Use of CNN to classify fashion-MNIST dataset into 10 classes
- **Document Summarization:** Use of Bidirectional LSTM with attention mechanism, performed on WeatherGov dataset

### • Pattern Recognition

*Academic Projects*

- **SVD and Polynomial Regression:** Image reconstruction using eigen vectors and Curve Fitting
- **Bayes Classifier and Classifier evaluation:** Classification of linearly separable and non-linearly separable data. Using ROC curves to check how good our classifier is.
- **Gaussian Mixture Models:** Density estimation using GMMs for real and synthetic data.
- **Hidden Markov Models and DTW:** Isolated and connected digits recognition using HMMs, feature extraction for handwritten digits and usage of dynamic time warping for sequential digit data recognition.
- **Kernel density estimation and One-vs-all classification:** Parzen Window, Fisher discriminant based classifier, Perceptron based classifier, Support Vector Machines, Neural Network

### • Robotics

*Academic Projects*

- **Basic Navigation:** Obstacle Avoidance, Wall following, Signal Reading and Reactions. [Video link](#)
- **Calculated movements and Navigation:** Positional Coordinate awareness, Path finding to reach specific position. [Video link](#)

### • Spam Filter

*Bachelor's Thesis and Project*

[Link to Spam filter](#)

- **Text Classification:** Emails were classified as spam or ham; using Bayes classifier
- **Utility:** System used GMail APIs to fetch and move emails within a GMail account. Custom marked emails were used in supervised training of the classifier running remotely.

- **Extended a paper to create an Algorithm for setting up of a MAN Topology**  
*The Split Domination in Arithmetic Graphs, Published in Foundation of Computer Science, New York, USA*
- **Advanced Network Architecture Setup**  
*Manual installation and configuration of a router network, using CISCO Simulator.*
- **Faculty-Student Interaction Management System**  
*Created using PHP, MySQL and other web technologies*

## TECHNICAL SKILLS

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- **Programming and Scripting Languages:** C/C++, Python, MATLAB, JAVA, C#, SQL, SparQL, PHP, BASH Shell Scripting, 8085 Assembly Language etc.
- **Web Technologies:** JavaScript(+jQuery etc.), PHP(+MVC framework = Codeigniter), Python(Flask framework), Apache Server
- **Simulator:** NetSim, Multisim (Circuit Design Suite) Power Pro, GNUSim8085
- **C#:** Development using Windows Presentation Foundation, Microsoft Speech API (SAPI 5.3): Recognition and Synthesis
- **Hands-on experience:** Wireshark, Corel Draw, Corel Photo Paint, Audacity, 3D Studio Max, Adobe After Effects, Photoshop, Lightroom etc.

## COURSE WORK

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- **Deep Learning:** Feed Forward Neural Networks, CNN, RNN, LSTM, Word2Vec
- **Pattern Recognition:** Gaussian Mixture Models, Bayesian Classifiers, One Vs All Classification, Parzen's Window, Neural Networks
- **Robotics:** Different parts used in a robot, Swarm Robotics, Genetic Algorithms
- **Artificial Intelligence:** Fuzzy Logic, Bayesian Inference, Hidden Markov Models, EM Algorithm, Sampling, Probabilistic Graphical Models
- **Ontologies:** RDF, OWL, SparQL, Triplestores, Turtle syntax, Description Logic

## LABS

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- **Advanced Programming:** Implementing different algorithm paradigms and data structures
- **Digital Design:** Creation of different Circuits using various ICs
- **Robotics:** Learning using LEGO NXT
- **Advanced Networking:** Analysis of local network using Wireshark
- **Microprocessor:** Running Programs written in Assembly on 8085 microprocessor

## POSITIONS OF RESPONSIBILITY

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- **Teaching Assistant, July 2017 – December 2018, IIT Madras:** Served as Teaching Assistant for Introduction to Programming for three consecutive semesters
- **Teaching Assistant, January 2017 – June 2017, IIT Guwahati:** Served as Teaching Assistant for Theory of automata and formal languages, Instructed by Professor Diganta Goswami
- **Teaching Assistant, July 2016 – December 2016, IIT Guwahati:** Served as Teaching Assistant for Data Structure and Algorithms, Instructed by Assistant Professor Chandan Karfa