

## EDUCATION

- + **Birla Institute of Technology and Science (BITS) Pilani** Goa, India  
Aug. 2017 - Jul. 2021  
Bachelors of Engineering (B.E.) in Computer Science. [ GPA: 8.10/10.0 ]

## EXPERIENCE

- + **Visual Computing Group, Harvard University** [ [Web](#) ] Cambridge, USA  
Jan. 2021 - Current  
Visiting Researcher, Advisor - [Prof. Hanspeter Pfister](#)
  - Working on zero-shot segmentation for [RhoANA](#) and [PyTorch Connectomics](#).
- + **Computer Vision and Robotics Laboratory, UIUC** [ [Web](#) ] Champaign, USA  
Nov. 2020 - Current  
Visiting Researcher, Advisor - [Prof. Narendra Ahuja](#)
  - Working on developing interpretable Computer Vision architectures.
- + **APP Center for AI Research (APPCAIR) & TCS Research** [ [Web](#) ] BITS Pilani, India  
Jan. 2020 - Dec. 2020  
Undergraduate Researcher, Advisors - [Prof. Ashwin Srinivasan](#) and [Dr. Shirish Karande](#)
  - Currently working on three projects - [1] Compositional Visual Reasoning using Action Graphs, [2] Root Cause Analysis in Time Series datasets, & [3] Optimising RL algorithms using the Winnow Learning Rule.
  - [1] Focuses on methods to generate Action Graphs to model temporal reasoning on the CATER dataset. [ [Preliminary Demo](#) ]
  - [2] Focuses on developing algorithms that can identify important features in multi-variate Time Series data.
  - [3] Focuses on using the Winnow Learning Rule to speed up inference time on Standard Reinforcement Learning algorithms.
  - Previously worked on Neuro-Symbolic models for the Bongard Problems, by extending the DeepProbLog framework.
  - In the above, used Deep Models for pattern detection/localization & Problog for estimating hypothesis likelihoods.
- + **European Centre for Medium-Range Weather Forecasts** [ [Web](#) | [Project](#) | [Talk](#) | [Slides](#) | [Demo](#) ] Reading, UK  
May. 2020 - Oct. 2020  
Research Intern, Advisor - [Dr. Peter Dueben](#)
  - ECMWF is Europe's largest meteorological research institute and serves  $\sim$  400 TB of weather data daily.
  - Built Machine Learning models for Streaming Time-Series Anomaly Detection to optimise ECMWF's data services.
  - Implemented Deep Time Series Forecasting methods like N-BEATS; reduced Server Downtimes by up to 4 hours.
  - Work was supported by a grant of £5,000 and was done as part of ECMWF's Summer of Code program - [ESoWC](#).
- + **Media.net, Directi** [ [Web](#) ] Mumbai, India  
May. 2020 - Jul. 2020  
Software Development Intern
  - Media.net is one of the largest Ad-Tech companies in the world, specifically focused on contextual advertisements.
  - Worked in the Ad-Experience team building models to predict and act on malicious bids for web advertisements.
  - Implemented algorithms for client-side detection and identification of malicious activities in foreign scripts.
- + **Head Office, Bank Of Maharashtra** [ [Project](#) ] Pune, India  
May. 2019 - Jul. 2019  
Software Development Intern
  - Developed a framework for automatic signature verification that learnt signatures from few ( $\leq$  24) samples.
  - Used a Siamese Network to train signature representations, and encapsulated the code into a python package.
- + **Pixxel** [ [Web](#) ] Bangalore, India  
Feb. 2019 - Apr. 2019  
Research Intern
  - Pixxel is a space-tech start-up. I worked on real world Machine Learning applications for their satellite data.
  - Built use-case prototypes from existing satellite data vendors for Geological applications [ [Feasibility Report](#) ]

## RESEARCH PROJECTS

- + **Schizophrenia detection using Electroencephalography Signals.** BITS Pilani, Goa  
Sep. 2019 - Feb. 2020  
Advisor: [Prof. Amalin Prince](#)
  - Areas: Deep Learning, Signal Processing.
  - Developing Deep Convolutional Neural models for automated diagnosis of Schizophrenia using EEG signals.
  - Exploring various Signal Processing techniques for building better representations from raw signals.
  - Exploring techniques such as Short Term Fourier Transform (STFT) and Empirical Mode Decomposition (EMD).
- + **Implementing STDP on a Basal Ganglia model of a Layered Spiking Neural Network.** BITS Pilani, Goa  
Jul. 2019 - Dec. 2019  
Advisor: [Prof. Basabda Sen Bhattacharya](#)
  - Areas: Spiking Neural Networks, Neuroscience.
  - Implemented reinforcement learning in a spiking neural network using Spiking-Timing-Dependent Plasticity (STDP).
  - Developed a Basal Ganglia model that makes use of the Three-Factor Learning rule [ [Report](#) ]
  - In collaboration with the [Human Brain Project](#), and the [SpiNNaker](#) neuromorphic computing framework.

# SELECTED PERSONAL PROJECTS

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## + Emotion Recognition from Audio Signals [ [Github](#) | [Code](#) ]

- Developed a Deep Learning pipeline for Emotion recognition using speech data, on the MELD Dataset.
- Classified emotions across various emotions : [Disgust, Fear, Neutral, ...] across a highly unbalanced data sample.
- Used Mel-frequency cepstral coefficients (MFCCs) to form speech representations and CNNs for classification.

## + Memotion Sentiment Analysis [ [Github](#) | [Code](#) ]

- Integrated deep text and image processing models to build a Multimodal Sentiment Analysis system.
- Fine-tuned pretrained BERT and ResNext model and combined their representations using Late Fusion.
- Classified sentiments on Internet Memes across different categories using the fused model.

# MENTORSHIP & LEADERSHIP EXPERIENCE

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- + President - Society for Artificial Intelligence and Deep Learning [ [Webpage](#) ] Jun. 2020 - Current
  - President of the University's Artificial Intelligence and Deep Learning Research Society - SAiDL
  - Helped organise the [Summer Symposium on AI Research](#) - hosting top researchers from industry and academia.
  - Leading a group (~ 30) of talented undergraduates, holding Paper Reading sessions and working on Open-Source projects.
- + Teaching Assistant - BITS G513 [ [Meta Learning](#) ] [ [Webpage](#) ] Jan. 2021 - Current
  - Study in Advanced Topics (Graduate level) course on Meta Learning conducted in collaboration with IIT Delhi & IIIT Delhi.
  - Responsible for conducting labs and evaluating projects, working under [Prof. Tirtharaj Dash](#) and [Dr. Gautam Shroff](#)
- + Teaching Assistant - BITS F464 [ [Machine Learning](#) ] (Twice) [ [Webpage](#) ] Jan. 2020 - Dec 2020
  - Conducted Labs & Tutorials on topics like - Linear Regression, Bayes Nets, SVMs, Neural Nets, Decision Trees & Clustering.
  - Also responsible for developing the course projects/competitions and evaluating them.
- + Teaching Assistant - Data Science, iXperience [ [Webpage](#) ] Jul. 2019 - Aug. 2019
  - Professionally taught Data Science & Machine Learning as a TA for iXperience's Data Science program.
  - Taught and mentored a diverse group of college students from various universities (Yale, Harvard, Cambridge, Princeton, UCLA, UCSD, etc) around the world, covering topics like Data Modeling, Time Series Analyis & Web Scraping.
  - Mentored a team of 8 interns for [BUDS Lab, NUS](#), exploring data driven solutions to urban planning problems.
- + Technical Mentorship Programme, BITS Pilani Aug. 2019 - May 2020
  - Mentored a group of 15 first-year Undergrads, under the Department Mentorship Programme.
  - Introduced them to various fields of Computer Science and helped them get started with programming.

# AWARDS & GRANTS

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- + AI Summer School - Google Research India [ [Website](#) ] Jul. 2020
  - Among 150 students selected across India to attend a sponsored Summer School on Machine Learning.
  - Offered a seat in the **Computer Vision track** (containing 50 students) in line with previous research experiences.
- + ECMWF Summer of Weather Code [ [Website](#) ] May. 2020
  - Received a grant of £5,000 to develop Time-Series Anomaly Detection methods for ECMWF's massive data services.
- + CBSE Group Mathematics Olympiad [National Level] [ [Ranklist](#) ] Dec. 2014
  - Secured All India Rank 12 in CBSE Group Mathematics Olympiad (preliminary qualifier for IMO) in class 10.
  - Among the 33 students from CBSE grades 9-11 to qualify for Indian National Mathematical Olympiad (INMO).

# COURSES

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- + On Campus: Machine Learning (was TA too, twice), Neural Networks and Fuzzy Logic (ranked 3/85), Artificial Intelligence, Foundations of Data Science, Compiler Construction, Computer Networks, Object Oriented Programming (OOP), Logic in Computer Science, Design and Analysis of Algorithms (DAA), Data Structures and Algorithms (DSA), Database Systems (DBMS), Operating Systems (OS), Linear Algebra.
- + Online: [fast.ai](#) - Deep Learning and Machine Learning courses, [Stanford CS231n](#) - Convolutional Neural Networks for Visual Recognition, [UC Berkeley CS 285](#) - Deep Reinforcement Learning.

# TECHNICAL SKILLS

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- + Frameworks: PyTorch, Tensorflow, Keras.
- + Languages: Python, C++, C, MATLAB, Prolog, MySQL. L<sup>A</sup>T<sub>E</sub>X
- + Libraries: Numpy, Pandas, Matplotlib, Scikit-learn, OpenCV, MNE, Pytorch-Lightning.
- + Experience: Computer Vision, Image Processing, Logic Programming, Data Structures and Algorithms.

# MISCELLANEOUS

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- + Hobbies - Bash Scripting, Watching Art-house Films, Swimming and Squash.
- + Keenly interested in Technology, Futurism, History & Geopolitics.