

EDUCATION

- + **Birla Institute of Technology and Science (BITS), Pilani** Goa, India
Aug. 2017 - Jul. 2021
Bachelors of Engineering (B.E.) in Computer Science.

PUBLICATIONS

- + Tirtharaj Dash, Sharad Chitlangia, Aditya Ahuja, & Ashwin Srinivasan. *Incorporating Domain Knowledge into Deep Neural Networks.* [[Arxiv Preprint](#)]

EXPERIENCE

- + **Visual Computing Group, Harvard University** [[Web](#)] Cambridge, USA
Jan '21 - Current
Visiting Researcher, Advisor - [Prof. Hanspeter Pfister](#)
- Working on few-shot image instance segmentation for [RhoANA](#) and [PyTorch Connectomics](#) pipelines.
- + **Computer Vision and Robotics Laboratory, UIUC** [[Web](#)] Champaign, USA
Dec '20 - Feb '21
Remote Contributor, Advisor - [Prof. Narendra Ahuja](#)
- Worked on developing interpretable Computer Vision architectures.
- Also contributed code to various other projects at the lab.
- + **APP Center for AI Research (APPCAIR) & TCS Research** [[Web](#)] [[Demo](#)] BITS Pilani, India
Jan '20 - Dec '20
Undergraduate Researcher, Advisors - [Prof. Ashwin Srinivasan](#) and [Dr. Shirish Karande](#)
- Contributed to four projects - ① Compositional Visual Reasoning using Action Graphs, ② Joint Neuro-Symbolic training, ③ Root Cause Analysis in Time Series datasets, & ④ Optimising RL algorithms using the Winnow Learning Rule.
1. Built methods to generate Action Graphs to model temporal reasoning on the CATER dataset (Demo above).
2. Focused on building Neuro-Symbolic reasoning models for the Bongard Problems, by extending the DeepProbLog framework.
3. Explored Anomaly Detection, Correlation and Root-Cause Analysis algorithms for multi-variate Time Series data.
4. Focused on using the Winnow Learning Rule to speed up inference time on standard Reinforcement Learning algorithms.
- + **European Centre for Medium-Range Weather Forecasts** [[Web](#) | [Project](#) | [Talk](#) | [Slides](#) | [Demo](#)] Reading, UK
Jul '20 - Sep '20
Research Intern, Advisor - [Dr. Peter Dueben](#)
- ECMWF is Europe's largest meteorological research institute and serves ~ 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 '20 - Jul '20
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 '19 - Jul '19
Software Development Intern
- Developed a framework for automatic signature verification that learnt signatures from few (≤ 24) samples.
- Used a Siamese Network to train signature representations, and encapsulated the code into a python package.
- + **Pixxel** [[Web](#)] Bangalore, India
Feb '19 - Apr '19
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 Deep Electroencephalography Models.** Sep '19 - Feb '20
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 Spiking Neural Network.** [[Report](#)] Jul '19 - Dec '19
Advisor: [Prof. Basabdhata 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
 - In collaboration with the [Human Brain Project](#), and the [SpiNNaker](#) neuromorphic computing framework.
- **Emotion Recognition from Audio Signals** [[Github](#) | [Code](#)] Dec '19
 - 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](#)] Nov '19
 - 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

- **President - Society for Artificial Intelligence and Deep Learning** [[Webpage](#)] [[GitHub](#)] Jun '20 - Current
 - President of the University's Artificial Intelligence and Deep Learning Research Group - 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](#)] [[GitHub](#)] Jan '21 - May '21
 - Study in Advanced Topics ([Graduate 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 '20 - Dec '20
 - 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 '19 - Aug '19
 - 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 Analysis & 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 '19 - May '20
 - Mentored a group of 15 first-year Computer Science Undergraduates, under the Department Mentorship Programme.
 - Introduced them to various fields of Computer Science and helped them get started with programming.

AWARDS & GRANTS

- **AI Summer School - Google Research India** [[Website](#)] Jul '20
 - 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 '20
 - 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 '14
 - 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

- **On Campus:** [Meta Learning](#) (Audit, TA too) [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 & Analysis of Algorithms, 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

- **Frameworks:** PyTorch, Tensorflow, Keras.
- **Languages:** Python, C++, C, MATLAB, Prolog, MySQL. L^AT_EX
- **Libraries:** Numpy, Pandas, Matplotlib, Scikit-learn, OpenCV, MNE, Pytorch-Lightning.
- **Experience:** Computer Vision, Image Processing, Logic Programming, Data Structures and Algorithms.

MISCELLANEOUS

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

[adiyah80.github.io/cv.pdf]