Sharad CHITLANGIA

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EDUCATION

Present | **Birla Institute of Technology and Science Pilani, GOA, India**
August 2017 | Bachelor of Engineering (Hons.), Electronics & Instrumentation. CGPA = 7.64

EXPERIENCE

August 2019 – June 2019 | **Harvard University | Edge Computing Lab**
Research Intern | Advisor: Vijay Janapa Reddi
Worked at intersection of Image Deep Reinforcement Learning and Energy Efficiency for Drones. Extensive use of Tensorflow and TFLite. Performed >350 experiments to **show effects of Quantization in RL, Quantization during training** to be a better regularizer than traditional techniques and thus enable higher exploration and generalization.

August 2019 – May 2019 | **CERN-HSF**
Google Summer of Code 2019 | Mentors: Moritz Kiehn, David Rousseau, Andreas Salzburger and Jean-Roch Vlimant
Particle Track Reconstruction using Machine Learning. Ported top solutions from TrackML challenge to ACTS Framework. Added an example of running pytorch model in ACTS using Pytorch's C++ frontend libtorch in an end-to-end fashion to enable rapid testing of models and thread safe fashion to allow massive parallel processing. Testing with GNNs.

August 2018 – May 2018 | **UnFound.ai**
Machine Learning & NLP Intern | Mentor: Ankur Pandey
Revamped the existing Information Retrieval system to focus more on distributional semantics. Developed embeddings from a deep learning based model which could capture Semantic, Syntactic as well as Contextual information - **ELMo**. Training and deploying Stance Detection models - **ESIM**

PUBLICATIONS

Srivatsan Krishnan*, **Sharad Chitlangia***, Maximilian Lam*, Zishen Wan, Aleksandra Faust, Vijay Janapa Reddi
"Quantized Reinforcement Learning (QuaRL)"
Workshop on Resource Constrained Machine Learning at 3rd Conference on Machine Learning and Systems - **MLSys**
Arxiv, Code

SELECT PROJECTS

Causal Machine Learning JAN'20
Sponsored Project with TCS Research
- Extending work on Neural Network Attribution for Interpretable Machine Learning
- Studying *Average Causal Effect* (ACE) on larger models like CNNs, Transformers, etc
- Identifying Causal Representations in Deep Relational Machines using Interventional Expectation.

Neural Voice Cloning with Few Samples JAN'18 - MAY'18
Code
- Few Shot Learning based Methodology. Encoder Captures Speaker Features in Latent Space.
- Speaker Features fed to multi-speaker generative model (Deep Voice 3) + WaveNet to generate speaker conditioned Voices.
- Close to 150 ⋆on GitHub. Final Voices

Autonomous Drone Navigation using Deep Reinforcement Learning AUG '18 - MAY '19
Code | Funded Project
- Imitation Learning on IDSIA Dataset to classify directional commands for UAV to navigate. ResNet18 to classify images.
- Tested some features with Mask RCNN for segmentation of forest paths as navigable by UAV.
- Project nominated by Institute and EEE Department to be one of the few sponsored projects.

Neuromodulated STDP for Basal Ganglia AUG'19 - DEC'19

Spiking Neural Networks with Basabdatta Sen Bhattacharya | The Human Brain Project

- Implementation of Neuromodulated STDP using Izhikevich Neuron Models
- Motor Action Learning for Basal Ganglia Motor Neuron actions.
- Experiments on the HBP Platform

Particle Track Reconstruction using Machine Learning AUG '18 - DEC '18

Code, Report, *Design Project* with Kinjal Banerjee

- Initial Candidate Pair and Triplet estimation using Machine Learning except Graph Neural Networks.
- Followed by reconstruction using Outlier Density Estimation Algorithm.
- GNN model directly predicted weights between candidates for direct reconstruction.

Epileptic Seizure Detection using Deep Learning AUG'18

Code, Report, *Course Project in Cognitive Neuroscience* with Veeky Baths

- Implementation of End-to-end Deep Learning models used to predict seizures on first 60 seconds of EEG Recordings
- 32 channel Data - TUH EEG Corpus.

Pneumonia Detection using Deep Learning AUG'18 TO DEC'18

Code with TCS Research

- Benchmarked SOTA models in Image Classification and Segmentation on RSNA Pneumonia Detection Dataset.
- Models tested - DenseNet, InceptionNetV3, MaskRCNN to transfer learn on the dataset,

Human Swarm Intelligence for Reconnaissance OCT'18 - DEC'18

In collaboration with DRDO India

- Phase 1 - Made a waypoint controller system for Multi-drone systems in ROS.
- Certificate

TALKS AND CONFERENCES

ASCII Orientation BITS GOA, INDIA, SEP'19

Delivered a talk. Audience: Freshman year students
Invited to give a talk on the recent advances of Machine Learning in technology, it's prospectives as a career and how to start.

OPEN SOURCE

- Participated in **Google Summer of Code 2019** with CERN-HSF to work on contributing to the ACTS framework. Final Product
- All projects open-sourced on GitHub.

TEACHING AND LEADERSHIP ROLES

Present May 2019	**Society for Artificial Intelligence and Deep Learning** *President* Leading and mentoring a group of 15 talented individuals in the field of Artificial Intelligence and Deep Learning.
Present July 2019	**Intel Student Ambassador for Artificial Intelligence** Working on publishing technical articles on Artificial Intelligence using Intel technologies. Latest article on Particle Track Reconstruction using Machine Learning
October 2019 June 2019	**Pixxel** *Research* Study of Applications of Hyperspectral Unmixing. Report
December 2019 August 2019	**Python BootCamp** *Organiser and Instructor* Initiative to teach Python to freshman year students. To get them upto speed with various projects happening on Campus

December 2019 – August 2019 | **Project Mentor**
Instructor and Mentor
Leading and mentoring 4 projects on campus spanning the field of *AI - Language Research*, *Applications of Cognitive Neuroscience in AI*, *Learning how to play games using Reinforcement Learning*, and *Generation of Speech from Images - Image2Speech in MNIST*.

December 2018 – August 2019 | **Introduction to Deep Learning**
Co-Instructor
Introduced students to the concepts of Deep Learning. The course structure followed was similar to Stanford's CS231n. Course Material

February 2020 – March 2019 | **Quark**
Panel Coordinator - BITSHack (Hackathon) and Programmer's Inc
Responsible for leading the organising team of the hackathon and other programming events. Raised more than **10K$** for sponsorship. Record of **1000+ registrations** from all over India.

Relevant Coursework

Machine Learning*, Neural Networks and Fuzzy Logic*, Data Mining*, Probability and Statistics, Digital Image Processing, Digital Signal Processing, Microprocessors and Interfacing, Digital Design, Signals & Systems, Control Systems, Stanford's CS231n: Convolutional Neural Networks for Visual Recognition@, UCB's CS295: Deep Reinforcement Learning@, Stanford's CS224n: Natural Language Processing with Deep Learning@, Stanford's CS229: Machine Learning@. (* = Auditing, @ = Online)

Honours and Awards

Hack InOut Bengaluru, '19
Special Bounty Prize Winner
Won the special prize for designing a complete blockchain backed application - Decent League - A decentralized fantasy league. Prize given to only **1 out of 5400 teams** across India.

Skills

Languages	Python, C++, Ruby, Julia, SQL
Frameworks	Tensorflow, Pytorch
Technologies	Heroku, AWS EC2, Travis CI, Docker, LaTeX, Git
Operating Systems	Ubuntu, macOS
Spoken Languages	English, Hindi, French

References

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