PARTH DODHIA

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EDUCATION

Stanford University   **Stanford, CA**
MS in Electrical Engineering   2022-present
Coursework : Machine Learning*, Reinforcement Learning*, Design and Analysis of Algorithms*   * completed by Dec 22

Indian Institute of Technology (IIT), Bombay   **Mumbai, India**
B. Tech (Honors) in Electrical Engineering, GPA : 9.83/10   2018-2022
- **Institute Silver Medal**, **Best B.Tech Project**, Minor in Computer Science and Engineering
Coursework : Advanced Machine Learning, Advanced Random Processes, Stochastic Optimization, Markov Chains

TECHNICAL SKILLS

Languages : Python, C++, MATLAB, VHDL, HTML, LaTeX | **Frameworks :** PyTorch, Tensorflow, Keras, Keil μVision, Scilab

INTERNSHIPS

Samsung Electronics, AI-Big Data Lab | *Suwon, South Korea*   Jun '21-Jul '21
- Extended CartoonGAN and AnimeGAN TensorFlow models for cartoon stylization of images with minimal train data
- Proposed the use of Differentiable Data Augmentation and Transfer Learning to slash previous train set size by 90%

Indian School of Business, Center for Analytical Finance | *Hyderabad, India*   Apr '20-May'20
- Created an unsupervised climate-word dataset and climate-word classifier for analyzing company 10K reports
- Fine-tuned GloVe vectors on IPCC climate reports and used K-means clustering to create an unsupervised dataset
- Implemented LSTM word-classifier tackling class imbalance with weighted cross-entropy loss to achieve 0.75 κ-score

PUBLICATIONS AND PREPRINTS

- S. Chandak, V. S. Borkar and P. Dodhia, "Concentration of Contractive Stochastic Approximation and Reinforcement Learning", in Stochastic Systems, doi:10.1287/stsy.2022.0097
- S. Chandak, V. S. Borkar and P. Dodhia, "Reinforcement Learning in Non-Markovian Environments", arXiv (2022), 2211.01595. Submitted to Systems and Control Letters.

RESEARCH PROJECTS

Contractive Stochastic Approximation | Mentor : *Prof. Vivek Borkar* | *IIT Bombay*   Aug '21-Oct '22
- Derived a tail-error concentration bound for contractive stochastic approximation and applied it to RL algorithms
- Extended it to agent design on arbitrary environments by learning environment dynamics offline from histories
- Implemented encoder-decoder neural networks with latent variables as agent states for Q-Learning

Adaptive Frank-Wolfe algorithm | Mentors : *Tavor Baharav, Prof. Mert Pilanci* | *Stanford University*   Dec '20-Mar '22
- Applied adaptive algorithms to accelerate Franke-Wolfe optimization for Lasso regression on large datasets
- Simulated Sequential Halving, LUCB and successive elimination algorithms in a fixed budget and fixed confidence settings on synthetic data and observed orders of magnitude of computational gains from the exact method

Automated Gleason Grading | Mentor : *Prof. Amit Sethi* | *IIT Bombay*   Mar '20-May'20
- Developed PyTorch semantic segmentation models to identify severity of prostate cancer in tissue images
- Parallelized pre-processing and training using DataLoaders for fast switch from multi-class to one-vs-all models
- Trained symmetric UNets with pre-trained encoders using Soft Dice and Focal losses to handle class imbalance

ACADEMIC PROJECTS

Maze Solver | Foundations of Intelligent Learning Agents   Fall '20
- Implemented Policy Iteration, Value Iteration and Linear Programming solutions to MDPs in Python
- Encoded mazes as MDPs with suitable transition probabilities and rewards to find shortest feasible paths

Channel Coding via Neural Mutual Information Estimation | Introduction to Machine Learning   Spring '21
- Implemented TensorFlow neural network based communication systems for channels with unknown statistics
- Used Mutual Information Neural Estimator for training and matched QAM performance on AWGN channel

MENTORSHIP

- Guided freshmen, sophomores and Academic Rehabilitation Program juniors as a student mentor at IIT Bombay