APOORV AGNIHOTRI

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EDUCATION

Indian Institute of Technology Gandhinagar *July 2016 - July 2020*
Bachelor of Technology, Computer Science and Engineering Overall Grade: 8.25/10

INTERESTS

I enjoy wearing a product manager's hat while writing code to solve problems using machine learning.

PUBLICATIONS

Exploring Bayesian Optimization
Apoorv Agnihotri, Nipun Batra, ***Distill 5.5 (2020)****: e26.*

Active learning for air quality station deployment
S. Deepak Narayanan, Apoorv Agnihotri, Nipun Batra, *Workshop on Real-World Experiment Design and Active Learning at* ***ICML 2020****.*

Poster Abstract: A Toolkit for Spatial Interpolation and Sensor Placement
S. Deepak Narayanan, Zeel B. Patel, Apoorv Agnihotri, and Nipun Batra. *Proceedings of the 18th Conference on Embedded Networked Sensor Systems (****SenSys '20****)*

Active Learning for Air Quality Station Recommendation
S. Deepak Narayanan, Apoorv Agnihotri, Nipun Batra, *Proceedings of the* 7^{th} *ACM IKDD CoDS and* 25^{th} *COMAD. 2020. 326-327.*

EXPERIENCE

Wadhwani AI Jun. 2020 - Present
Associate ML Scientist I | Advisor - *Dr. Rahul Panicker & Dr. Jerome White & Jigar Doshi*

Wadhwani AI is a nonprofit institute developing AI solutions for social good; funded by the likes of **Gates Foundation**, **Google Research**, and others.

- [TB Project] Worked with the Central TB Division of India to automate and scale diagnostic services using computer vision. Lead the efforts to build a technical proof of concept using object detection and computer vision. Co-designed the solution with inputs from the field.
- [Cotton Farming Project] Contributed in numerous directions including: surveying and implementing SOTA techniques for image rejection, object detection. Formulating and experimenting with multi-head, multi-task models to provide detailed rejection feedback. Building a reusable and modular code-base, working on a visualization dashboard for the ML models.
- [Misc.] 1) Published a white paper that detailed potential venues where AI solutions can help small-holder farmers in India have better incomes. 2) Participated and won HUL, Google and My Gov's *AI for Agriculture* Hackathon with cash reward of 1 million rupees.

IIT Gandhinagar May - Jul. 2019
Summer Research Intern | Advisor - *Prof. Nipun Batra*

- Published an expository article at **Distill** – an academic journal in Machine Learning (ML).
- Contributed to Polire and Vayu, open-sourced python libraries for spatial interpolation and air quality visualization, respectively.

NVIDIA May - Aug. 2018
Accelerated HPC & Machine Learning Intern

Contributed to rapids.ai—an open-sourced software suite consisting of GPU-optimized ML algorithms.
- Wrote CUDA kernels to implement three variants (Linear, Extended, Unscented) of Kalman Filters.

- Constructed a library to generate multivariate Gaussian random numbers from a uniform number generator using various matrix operations; the library was subsequently used by teammates from different projects.

ACHIEVEMENTS

Achieved a rank of **27th** out of the **240**+ teams that participated in KDD RL Cup (2019)—An international competition held by the premier academic conference in the field of data science, SIGKDD.

Kishore Vaigyanik Protsahan Yojana (KVPY) Fellow, 2016

TALKS

End to End Data Science on GPU's
Gave a talk to an audience of 40+ during PyData Meetup in Gandhinagar, introducing rapids.ai, which is an open-sourced software suite developed by NVIDIA to speed-up data science workflows.

PERSONAL PROJECTS

Reinforcement Learning in Games @ ML Course | **Link**
Implemented different learning algorithms such as Q Learning, Deep Q Learning and analyzed the respective efficiency on numerous environments in OpenAI's framework, Gym.

Machine Learning Library @ ML Course | **Link**
Designed and implemented a ML library from scratch; implementations include common ML algorithms such as Random Forests, Decision Trees, and Support Vector Machines. The library is a distillation of programming assignments from the machine learning course at IITGN.

Temporal Epipolar Regions @ Computer Vision (CV) Course | **Link**
Implemented a paper on estimating the region on an image where a moving object might lie. The object is assumed to move on a linear path and we have multiple shots of the objects separated in time and view. The motivation was to explore classical CV techniques that allow for motion prediction.

Exoplanet Detection @ Tech. Meet 2018 | **Link**
Tech. Meet is an annual inter-IIT event hosting numerous engineering competitions. The problem formulation represented binary classification of **time-series** data. Given luminance flux data of a distant solar system, predicted whether it contains a planet. We used basic frequency analysis, 1st order differences and classical ML techniques like Random Forests that placed our team 8th overall among all the IITs.

ONLINE COURSES

Intro to AI (CS188, UC Berkeley), Convolutional Neural Networks (CS231n, Stanford), Reinforcement Learning (David Silver, UCL), Neural Networks and Deep Learning (Coursera), Writing in Sciences (Stanford, Coursera), Probability (MITx)

SERVICE / EXTRA-CURRICULAR

- Teaching Assistant for the Technical Education Quality Improvement Programme—a program assisted by the World Bank to improve the quality of technical education system in India.

- Represented IIT Gandhinagar at ICPC (International Programming Contest) 2019 Regionals in IIT Kharagpur and IIIT Pune.