KARM PATEL

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Internships

1. Google Summer of Code (GSoC) - TensorFlow team Apr'22 - Jul'22
- Mentor: Dr. Kevin P. Murphy, Research Scientist at Google in Mountain View.
- Project: Tasks were related to his upcoming textbook 'Probabilistic Machine Learning: Advanced Topics'. in which I reproduced several figures by converting existing code into **JAX** framework. I studied and implemented some probabilistic ML algorithms such as Markov Chain Monte Carlo (MCMC) sampling and Variational Inference. Following blog contains more details about my tasks.
- Contributions: karm-patel.github.io/GSoC/

2. Summer Research Internship - IIT Gandhinagar May'21 - Jul'21
- Mentor: Prof. Nipun Batra
- Project: I worked on research project titled "Samachar: Print News Media on Air Pollution". We scraped around **17.4K** air pollution-related articles from the archives of The Times of India and The Hindu using python's libraries. Then we applied **exploratory data analysis** and **topic modeling** to reveal the news media response to air pollution. This work (PDF) has been accepted at ACM COMPASS conference.
- GitHub: github.com/karm-patel/Samachar-News-media-on-air-pollution

Education

M.Tech, Computer Science, *July 2022 - current*
IISc Bangalore, Karnataka, India. CGPA: 9.0/10.0

B.E., Computer Engineering, *Jun 2018 - May 2022*
VGEC, Ahmedabad, Gujarat, India CGPA: 9.23/10.0

Higher Secondary School, *Jun 2016 - Apr 2018*
S.S. Divine High School (GSEB Board), Ahmedabad, Gujarat, India Percentage: 85.3% (PCM)

Publications (Google Scholar profile)

1. **Samachar: Print News Media on Air Pollution in India** [PDF]
***Karm Patel**, Rishiraj Adhikary, Zeel B Patel, Nipun Batra, Sarath Guttikunda. In ACM SIGCAS/SIGCHI Conference on Computing and Sustainable Societies (COMPASS) (COMPASS '22)*

Projects

1. Attendance System using Face Recognition [Github] ***Python, Flask, SQL*** | *Jun 2020*
Web: Flask-based web application that provides functionalities such as taking attendance using face recognition, downloading attendance, and adding lectures.

Face recognition: In this blog, I implemented face recognition part ans shows the results. I have used the **Caffe** model to detect a face, the **FaceNet** model to get face embeddings, and the **SVM** model to classify faces.

Database: I have used the local MySQL database to store students' attendance records.

2. Vaccine Slot Notifier [Github] ***Python, Flask, AWS EC2*** | *Mar 2020*
I made this application to help people to get notifications of COVID vaccine slot when the slot is available on cowin portal. More than **200 people** registered on this website.

Web: I deployed a Live Web application (using flask) on an AWS EC2 instance, which collects the necessary details of a user and notifies him/her via email when a vaccine slot is available in his/her area.

Web scrapper: I made Web-Scrapper using **requests** and a **beautiful soap** python's libraries which continuously scrape data from the Cowin portal.

Last updated: Sunday 26th March, 2023

Technical Skills

- **Programming Languages:** Python, C, Java
- **ML frameworks:** JAX, TensorFlow
- **Tools:** GitHub actions, Docker, VS Code

Open Source Contributions

Apart from GSoC, I have also contributed in other libraries related to Probabilistic Models.

1. **blackjax:** Added demo notebook which illustrates **change of variable** technique from scratch in Hamiltonian Monte Carlo **(HMC)** algorithm [PR].
2. **pyro:** Added argument in an existing method that enables rendering parameters in the graphical probabilistic models [PR].
3. **numpyro:**
   (a) Added __repr__ methods of various constraints which made the representation of objects readable [PR].
   (b) Enabled rendering params in probabilistic graphical models (similar contribution to pyro) [PR].
4. **pymc:** Added moment and test for ExGaussian distribution [PR].

Courses

1. **IISc** [M.Tech CSA]: Probability and Statistics (A+), Applied Linear Algebra and Optimization (A), Computer Architecture (A), Design & Analysis of Algorithms (B+), Machine Learning (ongoing), Reinforcement Learning (ongoing), Compiler Design (ongoing), Computational Geometry (ongoing).
2. **Coursera** [B.E.]: ML by Andrew NG, Neural Networks and Deep Learning by Deeplearning.ai

Conference/Talks

1. **ACM COMPASS'22:** I presented my paper 'Samachar' in the ACM COMPASS conference. *Virtual | 1 JUL 2022*
2. **Air Sensors International Conference (ASIC):** I gave a 4 minute lightning talk about my work related to 'Samachar' paper. *In person | 26 AUG 2022*

Achievements | Extra Curricular

- **[2023]** Placement coordinator of CSA, IISc.
- **[2022]** I received acknowledgement in both books (book 1 and book 2) of Dr. Kevin for my contributions to the books' Codebase.
- **[2022]** AIR 128, GATE 2022.
- **[2019]** Team Leader in the project of state Hackathon and built a hostel management system.
- **[2018]** 3rd rank in A.R. RAO Mathematics state olympiad, Gujarat.