*Hyperlinks at appropriate places

Akshit Srivastava

Education

- **Indian Institute of Technology, Bombay**
  B. Tech., Metallurgical Engineering and Material Science — *2018 – 2022*

Experience

- **Mars Rover Team** — IIT Bombay
  Software Engineer — *Sept '18 - Mar '20*
  - **Obstacle Detection:** Detected obstacles in the trajectory via **clustering** of points in laser-scan map generated by Kinect v2, YDLidar sensor. Worked on UTM cost-grid based **path update** algorithms, involving satellite data parsing for altitude profile and increasing cost of terrain where the obstacle is detected.
  - **Path Planning:** Investigated path planning algorithms like A*, Dijkstras for autonomous operation of rover over the cost maps generated. Simulated an algorithm for **obstacle avoidance** based on cost profiles and gradients.

- **RSalesArm** — Mumbai
  NLP Intern — *Dec '19 - Jan '20*
  - Deployed a seq2seq model based chatbot by developing a backend using **Flask** connected to **MySQL** database
  - Involved in **Recurrent Neural Network** architecture design, data pre-processing, training and implementation
  - Devised a combination of **GloVe**, **fastText** and word2vec word embeddings to extract intents & entities

- **DevCom** — IIT Bombay
  Developer — *Mar '19 - Present*
  - **Insti-App:** Part of the team that maintains and develops the app that features the Placement Blog, Upcoming Events and general information on every active body in the Institute. Its Android App has **10,000+** downloads.
  - **Course Reviews:** Developed a **Django** database to store data dynamically fetched via Facebook's **Graph API**

Key Projects

- **Intelligent Feedback System** — IIT Bombay
  Guide: Prof. Chandan Dasgupta — *Summer '20*
  - Implemented Improvable models as scaffolds for promoting productive engagement in an engineering design activity
  - Ideated and designed the **working and architecture** of the complete system to be deployed on **Heroku**
  - Developed the backend using Django Channels for asynchronous socket communication using a **Redis** layer
  - Developed the frontend using **ReactJS**, used Django **REST API** for integration with backend

- **GradUmate** — IIT Bombay
  Entrepreneurship Cell — *Autumn '19*
  - Conceptualized a location-based **social networking app** as a deliverable for a Business Model Competition
  - Developed the backend in **Flask** with a **PostgreSQL** DB, frontend in **Angular**, used Google **API** to fetch location
  - Deployed the application on Amazon Web Services using Docker containers on a **Kubernetes** cluster

- **Unreasonable Effectiveness of RNNs** — IIT Bombay
  Seasons of Code - Web and Coding Club — *Summer '19*
  - Used **Tensorflow** to implement Bi-directional LSTM architecture trained on song lyrics for **text generation**
  - Used **PyTorch** to implement a Vanilla RNN model that **rates movie reviews** from worst to excellent
  - Used **Keras** to build a CNN based **OCR** trained on **MNIST dataset** to identify digits with **99%** test accuracy
  - Experimented with Random Forest, SVM, Decision Tree among other ML models to solve the **Titanic problem**

*Hyperlinks at appropriate places

Hobby Projects

- **Text-to-Image Synthesiser** *Spring '20*
  - Implemented StackGAN architecture in PyTorch which learns to map semantic text space to RGB image space
  - Applied various data augmentation techniques including distortions, random noise, and random rotations
- **Sudoku Solver** *Spring '19*
  - Developed using the **OpenCV** Python library to extract, solve, and print the solution on any captured image
  - Experimented with **Harris Corner detection**, probabilistic **Hough Line transformation**, for detecting the bounding boxes. Identified digits using the **Tesseract OCR** and solved the puzzle using **Backtracking**.
- **Facial Emotion Detection** *Autumn '19*
  - Used OpenCV and **Tkinter** to implement Voila Jones Algorithm to detect bounding box of human face
  - Used PCA for dimensionality reduction with a **CNN** based model for detecting seven human facial expressions

Technical Skills

- **Programming**: Python, C++, Javascript, Java, ROS, Bash, MATLAB/Octave
- **Development**: Django, Flask, Angular, ReactJS, Docker, Kubernetes, Flutter, Android Studio
- **Softwares/Tools**: Vim, Tensorflow, PyTorch, Git, MatplotLib, LaTeX, Jupyter, Arduino, OpenCV

Achievements

- Awarded **Silver** medal in **Coding Hackathon** in 8th **Inter-IIT** Tech Meet *(2019)*
- Awarded **Institute Technical Special Mention** for contribution to tech activities in the institute *(2020)*
- Mars Rover Team stood **First** in the system review stage of **Indian Rover Challenge** *(2019)*
- Secured **99.8** percentile among **1.05 million** candidates in Joint Entrance Examination (Main) *(2018)*
- Awarded the **National Talent Search Examination** scholarship by **NCERT**, Government of India *(2015)*
- Awarded the **Kishore Vaigyanik Protsahan Yojana** scholarship, aimed at encouraging students to take up research careers, funded by Government of India *(2016)*

Positions of Responsibility

- **Manager** IIT Bombay
  Web and Coding Club *Apr '20 - Present*
  - Leading a team of **9 sophomores** to cultivate and sustain a hobbyist coding culture in the institute
  - Planned and executed **Online Courses** on Python, Web Development & Machine Learning engaging **1000+** learners during the coronavirus pandemic. Oversaw the logistics for doubt solving and assignment evaluation.
  - Reorganised and supervising **DevCom** for steady progress of institute-level projects affecting **10,000+** students
- **Project Guide** IIT Bombay
  Reading Projects on GANs *Apr'20 - Jun'20*
  - Mentored **10+** students under an initiative by Web and Coding club for a project to understand **GAN**s
  - Introduced **PyTorch**, **CovNets**, helped attempt **Kaggle** competitions, implemented GANs using PyTorch

Relevant Courses

- **Material Science:** Material & Technology, Thermodynamics, Structure of Materials, Mechanics of Materials, Transport Phenomena, Kinetics of Processes, Phase Transformations, Mechanical Behaviour of Materials
- **Computer Science:** Computer Programming & Utilization, Algorithms & Complexity
- **Mathematics:** Calculus, Linear Algebra, Differential Equations, Numerical Analysis