Shiv Kumar

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Education

Netaji Subhas Institute of Technology — New Delhi, India
Bachelor of Engineering in Information Technology; CGPA: 8.37/10 — *May 2020 (Expected)*

Skills

- **Languages**: C,C++, Python, Javascript, Golang
- **Machine Learning** : Pytorch, Tensorflow, Openai Gym, Scikit Learn, NLTK
- **Other(s)**: Agile Methodology, Unix/Linux Systems, Git, Shell Scripting, mySQL, ROS, OpenCV

Experience

Laboratory for Computational Social Systems, IIITD, New Delhi — New Delhi, India
Research and Development Intern (Natural Language Processing and Social Analytics) — *October'18 - March'19*

- **DeFrauder**: An unsupervised learning method based model to detect fraud reviewer groups on online shopping platforms.
  - Designed and implemented methodology to construct novel datasets.
  - Explored several group-level behavioral traits to model inter-personal collusive dynamics of a candidate group.
  - The devised model achieved a **17.64%** improvement over the baseline model, averaged across various datasets.

Automated Rover and Embedded Systems Robotics, NSIT — New Delhi, India
Software Development Co-Lead — *August'18 - May'20*

- **ATOM Autonomous Thread**: Collaborated to design the stereo-visual odometry based autonomous thread for the rover.
  - Qualified for the on-site round of European Rover Challenge held in Poland in September'19.
  - Co-led a team of 10+ developers to design the complete thread.
  - Researched on 8-bit and 4-bit quantization based neural networks to be able to implement the threads on available hardware.

Center for Advanced Information Technology Field Studies, NSIT — New Delhi, India
Undergraduate Research Assistant (Opportunistic Networks, Large Scale Distributed Systems & Cryptography) — *September'18 - Present*

- **Incentivised Charging based Opportunistic Routing**: Researched on charging based incentivized message passing in Opportunistic Networks.
- **Hierarichal Opportunistic Routing**: Researched on hierarchy based algorithm for opportunistic routing

Projects

- **Dactyl [Here]**: Trained a double-jointed arm endpoint simulation to move to different target locations using **Deep Deterministic Policy Gradients** (DDPG) Reinforcement Learning algorithm.
  - Used distributed experience collection to improve performance and reduce training time. Training done without it needed 1000+ episodes to train the agent.
  - Achieved benchmark score of **+30 in 125 episodes**.
- **Hasktorch [Here]**: Opensource project implementing Haskell bindings for Pytorch, based on the Libtorch library.
  - Added and exposed multiple functionalities in the untyped API.
  - Implemented proof of concept Reinforcement Learning program for DQN using Hasktorch.
- **ElectionYay [Here]**: A Data Mining & Transfer Learning based project to analyse different sentiment and focus points of General Elections 2019.
  - Created a dataset of more than **2 lakh tweets** related to the 2019 General Elections which was also made available to other researchers.
  - Implemented and analysed different sentiment analysis methods, including transfer learning (based on language modeling) achieving approximately **70.3% test accuracy.**
  - Analysed the most popular leaders and parties in the elections (sentiment independent) along with party wise sentiment analysis. Also analysed different points which were marked as important on the social platform towards the final verdict.
- **Magical Commands for Bash(MCB)[Here]**: Linux terminal commands replaced with harry potter spells enriching the terminal experience.
  - Started an open source project to bring together Harry Potter fans on Github to replace bash commands with harry potter spells to personalise terminal experience with regular improvements and maintenance.
  - Guided **17** beginners in open source to make their first contributions, by making beginner friendly entry points during Hacktoberfest.

Publications

- Dhawan S., Reddy S., **Kumar S.**, Chakraborty T. (2019), *Spotting Collective Behaviour of Online Frauds in Customer Reviews*. International Joint Conference on Artificial Intelligence (IJCAI 2019), **published**. Presented at IJCAI'19, Macau. **[Document]**
- Sharma D.K., **Kumar S.**, Kumar A. (2018), *DNA based storage: Introduction, Characteristics Applications and Challenges*. International Journal of Machine Learning and Networked Collaborative Engineering(IJMLNCE), **published**. **[Document]**
- **Kumar S.**, Yadav A., Sharma D.K. (2019), *Deep Learning and Computer Vision in Smart Agriculture*. Modern Techniques for Agricultural Disease Management and Crop Yield Prediction, IGI publications, **published**. **[Document]**
- Sharma D.K., Dhurendhar S.K., **Kumar S.** (2020), *Hierarchical Search Based Routing Protocol for Infrastructure Based Opportunistic Networks*. International Journal of Innovative Computing and Applications, **approved for publication**.
- **Kumar S.**, Yadav A., Rastogi T., Sharma D.K. (2019), *Hybrid Computational Intelligence based Computer Vision Applications in Autonomous Robots*. Hybrid Computational Intelligence, Elsevier publications, **approved for publication**.