Vibhor Kumar

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Education

California Inst. of Technology [Caltech], *B.S. with Honors in CS, 3.8/4.0* *Sep. 2012 - Jun. 2016*

- At Caltech, I studied Computer Science, with a side-focus on Neuroscience. I worked on projects in both the industry and academia in a variety of fields, including Computer Graphics, Natural Language Processing, Cognitive Science, Computational Linguistics, and Machine Learning. I gained an appreciation for the difficulty in translating theory into practical results, and want to continue to bridge that gap.

Work and Experience

Visa Research, *Research Engineer* *Jul. 2016 - Present*

- Working on Big Data Analytics and Machine Learning (esp. Deep Learning) projects using structured datasets that give remarkable insight into financial trends and human behavior.
- Responsible for unifying data from various sources at Visa, and making some of the necessary transformations and derivations for training Deep Learning models.
- Filed patent for an action detection system on video data to automate service-related payments. Other ideas have been designed as Visa trade secrets.

Janelia Research Campus (HHMI), *Research Consultant* *Oct. 2015 - Jan. 2016*

- Analyzed raw electron-microscope scans of the entire Drosophila fly brain using CNNs in a Computer Vision framework to efficiently and accurately segment millions of synaptic connections.
- Contributed data augmentation pipeline to address small labeled data issue and other project-specific changes to the CNN model.

Tokyo Institute of Technology, *Research Exchange Student* *Jun. 2015 - Aug. 2015*

- Explored Cognitive Neuroscience from the perspective of Computer Science by carefully analyzing fMRI data, collected from language tasks, using standard statistical and Machine Learning techniques.
- Devised a novel Machine Learning paradigm to apply the technique of MVPA to our unique dataset.

Apple, *Platform Architecture - Graphics Research Intern* *Jun. 2014 - Sept. 2014*

- Worked with the exploratory graphics team to provide recommendations for future graphics hardware.
- Developed novel graphics software algorithms for efficient and visually appealing improvements over the current pipeline, and pre-existing techniques.

Selected Research Projects

Latent Transaction Feature Discovery with Deep Generative Models, *Visa Research* *Present*

- Using deep generative models (VAE, GAN, and hybrids) trained on transaction data with continuous and categorical features for synthetic transaction generation and the learning of latent features to improve merchant recommendation and fraud detection.

Shopping Influencers for Targeted Marketing, *Visa Research* *Present*

- Won the 2016 Visa Global Hackathon by inferring relationships from raw transaction data and identifying influencers. Implemented whole pipeline using Apache Pig and a novel MapReduce formulation.

Neural Basis of Language Switching in Jap.-Eng. Bilinguals, *Tokyo Tech* *Jun. 2015 - Aug. 2015*

- Analyzed fMRI data collected from Japanese-English bilinguals during a language-switching task to confirm involved brain regions, and to study underlying patterns using machine learning to simultaneously understand the neural basis of semantic representation of objects and bilingual language-switching.

Skills and Awards

Skills: **Python**, Java, C/C++, Haskell, **TensorFlow**, Caffe, **Apache Pig**/Hive, Hadoop MapReduce, CUDA, OpenCV, Matlab, Bash Scripting, LaTeX, Markdown, Git and Github, Japanese

Awards: 1st Place at Visa Global Hackathon 2016 (*Fall 2016*), Tokyo Institute of Technology International Research Opportunities Program (TiROP): Caltech Representative (*Summer 2015*), Caltech Scholarships (Stauffer, Marion Gene Vincenti, Frances and Howard Vesper), 1st place at Google Games Coding (*Spring 2013*), 11th Place Regional ACM Collegiate Programming Contest (*Winter 2012*)