Sunipa Dev
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Research Interests

I currently work with Word Embeddings and their geometry. In general, my research interests pertain to high dimensional spaces and their properties, and various modules of Machine Learning, Data Mining and NLP.

Education

- **University of Utah** — Salt Lake City, UT
  PhD Computer Science; GPA: 3.79 — *Aug 2016 – Ongoing*
  - **Coursework:** Data Mining, Machine Learning, Advanced Algorithms, Data Visualization, NLP
- **IISER** — Kolkata, India
  Integrated Bachelors and Masters in Mathematics and Statistics; GPA: 8.4/10 — *Jul 2011 – Jun 2016*
  - **Coursework:** Differential Geometry, Topology, Statistical Inference, Probability, Stochastic Processes

Recent Research Projects

- **Absolute Orientation for Word Embedding Alignment** — University of Utah
  Advisor: Dr. Jeff M. Phillips
  - Formulated linear transformation between two high dimensional embeddings based on single iteration rotation, translation and scaling to align embeddings generated from different mechanisms (GloVe, Word2Vec etc)
  - Successfully used the transformation for boosting word embedding performance using preliminary ensembles and for multilingual translations. **Preprint at :** arXiv:1806.01330
- **Attenuating Bias in Word Vectors** — University of Utah
  Advisor: Dr. Jeff M. Phillips
  - Devised and compared different ways to detect and remove bias from word embeddings
  - Defined simple, uniform qualitative tests to measure bias and quality of the embedding

Other Research Projects and Internships

- **Brain Data Analysis for Visual Perception of Different Stimuli** — IISER Kolkata
  Advisor: Dr. Anirban Banerjee — *Aug 2015 – May 2016*
  - Cleaned and visualized images using SPM and built models for regressing over activity levels in a sample cube or voxel of neurons during tasks
  - Built a classifier for what taste sensation is experienced in correspondence with the visual stimuli being seen.
  - Found discernible difference in active brain regions in response to different visual stimuli in terms of different basic shapes being seen
- **OIST - Advisor: Dr. Robert Sinclair** — Okinawa, Japan
  Simulation of Stimuli Processing in the Human Visual Cortex — *May 2015 - Aug 2015*
  - Generated stimulus data using a Gaussian distribution and simulated flow of stimuli in the visual and auditory cortex
  - Successfully produced accurate simulations of the two basic senses and established a weak link between the two

Skills

- **Languages with High Proficiency:** Python, MATLAB, R
- **Languages with Medium Proficiency:** C, JavaScript, HTML, Perl, MySQL

Extra-Curricular Activities

- Teaching Mentee for Data Mining (Spring 2018) and Foundations of Data Analysis (Fall 2017)
- Secretary of Literary Club, IISER Kolkata and chief editor of Muse, the annual magazine
- Secured the DST Inspire awarded to the top 1% students in science in India