Sunipa Dev

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Education

- **University of Utah** Aug 2016 – Dec 2020
  PhD Computer Science; Advisor : Jeff M Phillips *Salt Lake City, UT*
  - **Coursework:** Data Mining, Machine Learning, Advanced Algorithms, Data Visualization, NLP, Databases
- **Indian Institute of Science Education and Research, Kolkata** Jul 2011 – Jun 2016
  Integrated Bachelors and Masters in Mathematics and Statistics *Kolkata, India*
  - **Coursework:** Differential Geometry, Topology, Statistical Inference, Probability, Stochastic Processes

Research Experience

- **University of California, Los Angeles** Jan 2021 – Present
  Computing Innovation Postdoctoral Scholar; Mentor : Kai-Wei Chang *Los Angeles, CA*
- **University of Utah** Aug 2016 – Dec 2020
  Research Assistant; Advisor : Jeff M Phillips *Salt Lake City, UT*

Some Recent Projects

- **Interpreting Stereotypes in Language Representations and their Applications** UCLA
  - Developing tools to analyze and unify different measures which interpret biases in NLP. Also extend gendered tasks (like coreference resolution) and bias measures to be all gender inclusive.
  - Extending tasks from NLU to specialized NVDRS data by CDC to assess and detect stereotypical mental health perceptions and differential treatment of people based social or protected attributes.
- **Subspace Disentanglement in Language Representations for Bias Mitigation** University of Utah
  - Developed methods to detect the subspaces encoding societal biases such as gender, race and age related biases in language representations
  - Developed intrinsic and extrinsic probes to quantify different biases in word embeddings. Also established ways to measure the trade-off between bias removed and meaningful information lost.
  - Decoupled subspaces in different novel approaches relying on projection and orthogonalization in context-free and contextual embeddings to reduce harmful and stereotypical association propagation.

Internships

- **Building Interest Specific Embeddings for a User** Microsoft Bing Ads
  - Built distinct and adaptive user representations for instantaneous personalized recommendations based on their preferences, analogous to the contextual vector representations of polysemous words.
- **Disentangling Features from Transaction Embedding Space** VISA Research
  - Reduced interdependence of specific subspaces in transaction based merchant embeddings using precise disentanglement approaches for better translation of user behavior patterns in recommendations**(patent filed)**.

Selected Publications

- **S. Dev**, T. Li, J.M. Phillips and V. Srikumar; "On Measuring and Mitigating Biased Inferences of Word Embeddings"; AAAI 2020, New York City, USA; (oral presentation)
- **S. Dev**, S. Hassan, J.M. Phillips; "Closed Form Word Embedding Alignment"; ICDM 2019, Beijing, China; (oral presentation) **In Special Issue of KAIS for Best Papers from ICDM**
- **S. Dev**, J.M. Phillips; "Attenuating Bias in Word Vectors"; AISTATS 2019, Okinawa, Japan; (oral presentation)
- **S. Dev**, T. Li, J.M. Phillips and V. Srikumar; "OSCAR: Orthogonal Subspace Correction and Rectification of Biases in Word Embeddings"; under review;

Selected Teaching and Awards

- Conducted tutorial at **AAAI 2021**: A Visual Tour of Bias Mitigation Techniques in Word Embeddings.
- Teaching Mentee for Data Mining (Spring 2018, 103 students) and Foundations of Data Analysis (Fall 2017, 43 students) : conducted lectures, tutorials, project evaluations and office hours
- **Computing Innovations Fellowship** Award Recipient 2020 (by CRA, CCC and NSF)
- Grace Hopper Scholar 2019;

Service

- Reviewed for conferences like AAAI, EACL and ACL