

EDUCATION**University of California, Irvine, CA**

PhD in Computer Science

2017-Present

Core GPA: 3.96/4.00**Carnegie Mellon University (CMU), PA**

Masters in Intelligent Information Systems

Dec 2015

Core GPA: 3.91/4.00**Relevant Coursework:** Language and Statistics, Information Retrieval, Question Answering, Machine Learning for Large Datasets, Algorithms for Natural Language Processing, Structure Predictions.**Indira Gandhi Institute of Technology, Delhi, India**

B.E. (Hons.) Computer Science and Engineering

June 2011

Core GPA: 3.94/4.00**Relevant Coursework:** Discrete Mathematics, Algorithms Design & Analysis, Artificial Intelligence, Data Structures**SELECT PUBLICATIONS**

- Dua D, Y. Wang, P. Dasigi, G. Stanovsky, S. Singh, M. Gardner, DROP: A Reading Comprehension Benchmark Requiring Discrete Reasoning Over Paragraphs, NAACL 2019.
- ORB: An Open Reading Benchmark for Comprehensive Multi-Dataset Evaluation of Reading Comprehension, MRQA Workshop 2019
- Zhao Z, Dua D, Singh S. Generating natural adversarial examples, ICLR 2018.

RESEARCH AND ACADEMIC PROJECTS

- Working on Variation autoencoder based framework with Normalizing flows for language generation.
- Used generative adversarial network based architecture to create perturbations in natural language sentence which can fool a black-box classifier, paper accepted in ICLR 2018
- Participated in Event Detection and Co-reference task in TAC KBP 2015. Developed an Event Mention Detection system using Conditional Random Fields trained on k-best label sequences in an online-passive aggressive manner.
- Worked on Relation classification which involved introducing features extracted from Path Ranking Algorithm (NELL) into distantly supervised MultiR algorithm and achieved better results in Relation Classification at aggregate and sentential level from the current state-of-the-art technique
- Working on two components of a Question-Answering System for NTCIR QA Lab Task on World History Questions.
 - Events Knowledge Base – Extraction of event frames from unstructured data and finding temporal sequence amongst them using Markov Logic networks. This is further used for automated event-ontology extraction.
 - Machine Reading – Finding more domain specific documents based on various facets of an entity extracted from FrameNet and Wikipedia to build a domain-specific corpus.
- Built a Search Engine over a semester with different retrieval and feedback models.
 - Implemented various retrieval mechanisms ranging from Boolean operators, BM25 model to Bayesian Indri Model.
 - Worked on query enrichment using pseudo-documents.
 - Trained a Learning to Rank Model incorporating features from all different retrieval models, pseudo-relevance feedback and other features like PageRank.
- Developed various language models like n-gram, interpolated n-grams using Expectation-Maximization, back-off models, decision tree based language models, Maximum entropy models.
- Worked on structured predictions involving integer linear constraints imposed by techniques like Dual Decomposition, ADMM.
- Implemented various probabilistic graphical models
 - Sequence Predictions models - Hidden Markov Models, Conditional Random Fields and Viterbi Decoder
 - Tree Parsing models – Learning Probabilistic Context Free Grammar and the subsequent CKY parser
 - Random Walk with restarts for structure learning in co-reference network.
 - Sequence generation models with LSTMs and Recurrent Neural Networks.

WORK EXPERIENCE**IBM Research – Statistical Language and Discovery Team**

Mar 2016- August 2017

- Used Monte-Carlo tree Search with a hierarchical Sequence-to-Sequence model for abstractive document summarization.
- Used Policy-gradient and Deep-Q Network based techniques for extractive document summarization.
- Develop a Blocks like framework in Lua Torch for faster productionizing of deep-learned models

Microsoft Corporation – Bing Team

July 2011-August 2014

- **Knowledge Repository for Bing**
Used Bing's knowledge graph to surface information cards about entities on the search engine
- **SuperFresh Pipeline for Knowledge Repository**
Developed an infrastructure for point updates in the Knowledge graph to support fast updates of popular events.
- **Information and Content Experiences**
Developed a REST based web-service which provided various utilities like image comparison for regression testing.