Kolluru Sai Keshav

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Research Interests

Neural Open Information Extraction, Multi-Hop Question Answering, BERT Finetuning, Probing NLP Architectures, Low Resource Languages

Education

2017 - Present	PhD in **Computer Science and Engineering.** **Indian Institute of Technology, Delhi.** Supervisors: Dr. Mausam (IIT Delhi), Dr. Soumen Chakrabarti (IIT Bombay) CGPA: **9.25/10**
2013 - 2017	Undergraduate Degree in **Computer Science and Engineering.** **Indian Institute of Technology, Bhubaneswar.** CGPA: **9.78/10**
2011 - 2013	Intermediate Education at Mahathi Junior College, Visakhapatnam. Board of Intemediate Education, Andhra Pradesh, India. Final Grade: **96.5%**

Publications

- Keshav Kolluru*, Samarth Aggarwal*, Vipul Rathore, Mausam, Soumen Chakrabarti, *IMOJIE: Iterative Memory-Based Joint Open Information Extraction*, Submitted to ACL 2020
- Pratyush Maini*, Keshav Kolluru*, Mausam, *Analyzing the Power of Pooling in Recurrent Architectures*, Submitted to ACL 2020
- S.Sukumaran, M. Satpathy, Keshav Kolluru, R.Mall, *Inferring State Models using Feedback Directed Random Testing*, Asia-Pacific Software Engineering Conference, 2015.
- Keshav Kolluru, Prasenjit Mukherjee, *Query Clustering using Segment Specific Context Embedding*, arXiv:1608.01247.

Scholastic Achievements

Institute Rank (IR) and Departmental Rank (DR) 2 in the batch 2013-2017 of IIT Bhubaneswar.
Won the **best BTech thesis award** in Computer Science of IIT Bhubaneswar
Secured SGPA of 9.96 in 2nd Semester and 10 in 6th,7th, 8th Semester (BTech)
Qualified among the top 0.5% of the students (about 15,00,000) appeared for JEE(2013)

Work Experience

IBM Research Summer 2017
Research Intern
Worked on integrating Concept Flows in Neural Dialog systems - where a dialog can be seen as a linear flow of latent-concepts. Using Graph Clustering to identify the concepts, we trained an end-to-end LSTM network to identify the concepts and predict the words in the concept given the concept-chain so far.

Microsoft (Bing) Summer 2016
Data Science Intern
Worked on automatic discovery of important search-topics based on the queries received by Bing. Developed a scalable embedding method for search strings by extending Word2Vec for the retrieved snippets and devised a hierarchical clustering technique for search-query

clustering.

Projects

PhD

Neural Open Information Extraction 2019
Designed end-to-end BERT-based systems for extracting a set of facts from a sentence using bootstrapping from previous systems. Resulted in performance improvements of 18% compared to prior neural systems.

Analyzing the power of pooling in recurrent architectures 2019
Analyzed the reasons behind the performance improvement resulting from pooling hidden-states in LSTMs. Designed novel experiments which attribute the performance gap to solving vanishing gradients and remembering middle words.

Evidence aggregation for Open-Domain Question Answering 2018
Devised a new pooling technique, AbsMaxPool, that can efficiently integrate knowledge retrieved from a large corpora for answering complex science questions

Question-Answering on Semi-Structured Context 2017
Developed Multi-Instance Learning techniques for predicting SQL-type logical forms for Question-Answering on WikiTableQuestions dataset

BTech

Predicting the Effect of Forces in Images Prof. Chitta Baral, Arizona State University
Developed a novel model to predict the effect of forces on objects in 2D images by integrating classical physics equations into CNNs

A Scalable Architecture for Visual Question Answering (VQA)
Developed a VQA architecture consisting of a high-level interplay between the NLP and CV modules which won the *IBM-ICARE Watson Cognitive Challenge*

Verification of Synchronous Programs Dr. Partha Roop, University of Auckland
Developed a black-box method for verifying functional properties and timing constraints of synchronous programs

Inferring State Models using FDRT Dr. Manoranjan Satpathy, IIT Bhubaneswar
Developed a tool for extracting an abstracted state model from any Java program using Q-Learning

Teaching and Professional Services

Teaching Assistant for Artificial Intelligence, Natural Language Processing, IIT Delhi
Teaching Assistant for Programming and Data Structures, Operating Systems, IIT Bhubaneswar
Co-reviewed submissions to NeurIPS 2019 and EMNLP-IJCNLP 2019.
Responsible for http://www.cse.iitd.ac.in/nlpdemo, a collection of NLP demos from DAIR lab
Nominated and sponsored to attend Amazon Research Days 2018, Microsoft Academic Research Summit 2018.

Technical Skills

Courses *(IIT Delhi)* Deep Learning, Natural Language Processing, Machine Learning, Computer Vision, Deep Reinforcement Learning *(IIT Bbs)* Pattern Recognition, Soft Computing
Libraries (Advanced) PyTorch, Tensorflow (Basic) Dynet, Theano