# Kolluru Sai Keshav

www.cse.iitd.ac.in/~kskeshav                    keshav.kolluru@gmail.com

## EDUCATION

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|---|---|
| 2017 - PRESENT | PhD in **Computer Science and Engineering.**<br>**Indian Institute of Technology, Delhi.**<br>SUPERVISORS: Dr. Mausam (IIT Delhi), Dr. Soumen Chakrabarti (IIT Bombay)<br>CGPA: **9.25/10** |
| 2013 - 2017 | Undergraduate Degree in **Computer Science and Engineering.**<br>**Indian Institute of Technology, Bhubaneswar.**<br>CGPA: **9.78/10** |
| 2011 - 2013 | Intermediate Education at MAHATHI JUNIOR COLLEGE, Visakhapatnam.<br>BOARD OF INTEMEDIATE EDUCATION, ANDHRA PRADESH, India.<br>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