

# Vidhisha Balachandran

GRADUATE RESEARCH ASSISTANT · CARNEGIE MELLON UNIVERSITY

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## Education

### Carnegie Mellon University

Pittsburgh, Pennsylvania

#### PHD IN LANGUAGE TECHNOLOGIES

August 2019 - Current

- Advisor: Prof Yulia Tsvetkov
- Primary Interests: Transparency and Trust in NLP, Model Interpretability, Summarization, Question Answering.

### Carnegie Mellon University

Pittsburgh, Pennsylvania

#### MASTERS IN LANGUAGE TECHNOLOGIES (GPA: 3.89/4.0)

August 2017 - August 2019

- Advisors: Prof Jaime Carbonell and Prof William Cohen
- Recipient of Research Fellowship for the entire course duration (Monthly Stipend + Full Tuition Fee Waiver)
- Courses: Algorithms for NLP 11-711, Introduction to Machine Learning 11-701, Neural Networks for NLP 11-747, Structured Prediction for Language and Other Discrete Data 11-763, Probability and Statistics 36-700, Advanced Multimodal Machine Learning 11-777, Human Languages for AI 11-724, Topics in Deep Learning 10-707

### PES Institute of Technology

Bangalore, India

#### BACHELORS IN COMPUTER SCIENCE AND ENGINEERING (GPA: 9.6/10)

September 2011 - May 2015

- Within the top 5% of the class
- Recipient of MHRD Scholarship 2011-2015 (Full Tuition Fee Waiver)
- Courses : Algorithms, Data Structures, Operating Systems, Data Mining, Natural Language Processing, Database Management Systems, Big Data

## Experience

### Google Brain

Remote (Pittsburgh, Pennsylvania)

#### RESEARCH INTERN (HOSTS: DR ASHISH VASWANI, NIKI PARMAR)

May 2020 - August 2020

- Developing Scalable Open-Domain QA models.
- Implementing intermediate passage reranking modules to make Open Domain QA models over 13M Web documents more efficient.
- Leveraging computational power of TPUs for faster Top-K MIPS Search

### Google AI

Pittsburgh, Pennsylvania

#### RESEARCH INTERN (HOSTS: DR WILLIAM COHEN, DR MICHAEL COLLINS)

June 2019 - August 2019

- Developed QA models which learn to reason using Text + Wikidata Background Knowledge
- Developed Fact-Aware text representations for different downstream tasks
- Developed a general system to loosely align arbitrary text with related facts from Wikidata

### Language Technologies Institute

Pittsburgh, Pennsylvania

#### GRADUATE RESEARCH ASSISTANT

August 2017 - Current

- Developed transfer learning models for entity recognition (NER) and entity linking for closed domain data
- Achieved +53 F1 points gain in Insurance Domain NER using transfer learning and distant supervision
- Developed machine learning models for fraud detection in low resource domain

### Flipkart Pvt Limited

Bangalore, India

#### SOFTWARE DEVELOPMENT ENGINEER 2

July 2015 - July 2017

- Developed statistical models to score E-Commerce products and listings for quality.
- Built a scalable platform that performs the scoring for 133M entities with low latency and self-learning feedback loops.
- Incorporated the scores into the product search ranking algorithm to ensure better quality products are ranked higher, significantly reducing the return percentage of products by 60 basis points and increasing customer satisfaction by 0.5 Net Promoter Score
- Mentored interns on the NLP projects of text analysis; inferring causes for product returns; and contextual keyword extraction using RAKE and Doc2Vec

## Publications

2021	<b>Conference Paper</b> , Balachandran V, Pagnoni A, Lee JY, Rajagopal D, Carbonell J, Tsvetkov Y. : StructSum: Incorporating Latent and Explicit Sentence Dependencies for Single Document Summarization.	EACL
2021	<b>Conference Paper</b> , Joshi R, Balachandran V, Vashishth S, Black A, Tsvetkov Y. : DialoGraph: Incorporating Interpretable Strategy-Graph Networks into Negotiation Dialogues.	ICLR
2021	<b>Conference Paper</b> , Pagnoni A, Balachandran V, Tsvetkov Y. : Understanding Factuality in Abstractive Summarization with FRANK: A Benchmark for Factuality Metrics.	NAACL
2021	<b>Conference Paper</b> , Rajagopal D, Balachandran V, Tsvetkov Y, Hovy E. : SelfExplain: A Self-Explaining Architecture for Neural Text Classifiers.	Arxiv
2021	<b>Conference Paper</b> , Balachandran V, Vaswani A, Tsvetkov Y, Parmar N. : Simple and Efficient ways to improve REALM.	Arxiv
2020	<b>Conference Paper</b> , Dhingra B, Zaheer M, Balachandran V, Neubig G, Salakhutdinov R, Cohen W. : Differentiable Reasoning over a Virtual Knowledge Base.	ICLR
2015	<b>Conference Paper</b> , Sitaram D, Phalachandra HL, Harwalkar S, Murugesan S, Sudheendra P, Ananth R, Balachandran V, Kanji AH, Bhat SC, Kruti B. : Simple Cloud Federation.	AMS IEEE
2021	<b>Workshop Paper</b> , Balachandran V, Dhingra B, Sun H, Collins M, Cohen W. : Investigating the Effect of Background Knowledge on Natural Questions.	DeeLIO, NAACL
2020	<b>Workshop Paper</b> , Radhakrishnan K, Chakravarthy S, Kanakagiri T, Balachandran V. : “A Little Birdie Told Me ...” - Social Media Rumor Detection.	WNUT, EMNLP
2018	<b>Workshop Paper</b> , Balachandran V, Rajagopal D, Catherine R, Cohen W. : Learning to Define Terms in the Software Domain.	WNUT, EMNLP

## Teaching

Fall 2019	<b>Artificial Intelligence Course (15-681)</b> , Conducted Recitation, Designed Exams & Assignments	TA
Spring 2020	<b>Neural Networks for NLP (11-747)</b> , Assignment Grading, Project Mentorship	TA

## Mentorship

Fall 20-Present	<b>Rishabh Joshi</b> , Masters Student
Spring 21-Present	<b>Luyu Gao</b> , Masters Student
Spring 21-Present	<b>Maxine Lui</b> , Undergraduate Student
Fall 19-Spring 21	<b>Artidoro Pagnoni</b> , Masters Student
Spring 20-Fall 20	<b>Karthik Radhakrishnan, Sharanya Chakravarthy, Tushar Kanakagiri</b> , Masters Students

## Invited Talks

Apr, 2021	<b>On the Transparency and Reliability of Automatic Summarization</b> , CRIM Seminar Series	CRIM Montreal
Jul, 2020	<b>Incorporating External Background Knowledge into Natural Questions</b> , Google News, Brain	Google

## Service

2018-Present	<b>Reviewer</b> , ACL, EMNLP, NAACL, NeurIPS, SRW
Fall 2020-Present	<b>Committee Member</b> , CMU LTI DEI Committee
Spring 2021-Present	<b>Member</b> , CMU SCS PhD Dean's Advisory Committee
Fall 2020	<b>Organizing Committee Member</b> , CMU SCS Graduate Application Support Program

## Honours & Awards

2014	<b>Scholarship Recipient</b> , Google Anita Borg Memorial Award Asia Pacific	Tokyo, Japan
2014	<b>Scholarship Recipient</b> , Grace Hopper Conference	Bangalore, India
2011-15	<b>First Class Honours with Distinction</b> , All eight semesters during Bachelors	Bangalore, India