

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

	Conference Paper , Balachandran V, Pagnoni A, Lee JY, Rajagopal D, Carbonell J, Tsvetkov Y. : StructSum: Incorporating Latent and Explicit Sentence Dependencies for Single Document Summarization. <i>EACL</i> .	<i>Virtual</i>
2021	Conference Paper , Joshi R, Balachandran V, Vashishth S, Black A, Tsvetkov Y. : DialoGraph: Incorporating Interpretable Strategy-Graph Networks into Negotiation Dialogues. <i>ICLR</i> .	<i>Virtual</i>
2021	Conference Paper , Pagnoni A, Balachandran V, Tsvetkov Y. : Understanding Factuality in Abstractive Summarization with FRANK: A Benchmark for Factuality Metrics. <i>NAACL</i> .	<i>Virtual</i>
2021	Conference Paper , Rajagopal D, Balachandran V, Tsvetkov Y, Hovy E. : SelfExplain: A Self-Explaining Architecture for Neural Text Classifiers. <i>Arxiv</i> .	
2021	Conference Paper , Balachandran V, Vaswani A, Tsvetkov Y, Parmar N. : Simple and Efficient ways to improve REALM. <i>Arxiv</i> .	
2020	Conference Paper , Dhingra B, Zaheer M, Balachandran V, Neubig G, Salakhutdinov R, Cohen W. : Differentiable Reasoning over a Virtual Knowledge Base. <i>ICLR</i> .	<i>Virtual</i>
2015	Conference Paper , Sitaram D, Phalachandra HL, Harwalkar S, Murugesan S, Sudheendra P, Ananth R, Balachandran V, Kanji AH, Bhat SC, Kruti B. : Simple Cloud Federation. <i>Modelling Symposium (AMS) IEEE</i> .	<i>Taipei, Taiwan</i>
2021	Workshop Paper , Balachandran V, Dhingra B, Sun H, Collins M, Cohen W. : Investigating the Effect of Background Knowledge on Natural Questions. <i>2nd Workshop on Knowledge Extraction and Integration for Deep Learning Architectures</i> .	<i>Virtual</i>
2020	Workshop Paper , Radhakrishnan K, Chakravarthy S, Kanakagiri T, Balachandran V. : "A Little Birdie Told Me ..." - Social Media Rumor Detection. <i>6th Workshop on Noisy User-Generated Data, EMNLP</i> .	<i>Virtual</i>
2018	Workshop Paper , Balachandran V, Rajagopal D, Catherine R, Cohen W. : Learning to Define Terms in the Software Domain. <i>4th Workshop on Noisy User-Generated Data, EMNLP</i> .	<i>Brussels, Belgium</i>

Teaching

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

Course Projects

Self Supervision for Image Captioning using Image Jigsaws	<i>Advisor : Dr Louis-Philippe Morency</i>
TECHNOLOGIES USED: PYTHON, PYTORCH	<i>Sept 2018 - Dec 2018</i>
<ul style="list-style-type: none">• Exploring usage of self-supervision from solving a Jigsaw puzzle for Multi-modal tasks like Image Captioning• Exploring Joint Learning vs Transfer Learning settings to leverage information learned from solving Jigsaw puzzles• Initial experiments have shown a 0.5 BLEU score increase over State of Art Results	
Table to Text Generation	<i>Advisor : Dr Graham Neubig</i>
TECHNOLOGIES USED: PYTHON, PYTORCH	<i>Jan 2018 - May 2018</i>
<ul style="list-style-type: none">• Built a Seq2Seq model for generating biographies of people from Wikipedia Biography Tables• Used alignments between table and text phrases to improve biographies• Results were on par with previous State of Art models	

Honours & Awards

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