

Revanth Gangi Reddy

Graduate Research Assistant, UIUC *Siebel Scholar (Class of 2022)*

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Interests: Natural Language Processing, Deep Learning and Machine Learning

Citizenship: Indian

Education

B. Tech, Computer Science	Indian Institute of Technology (IIT), Madras	CGPA - 9.16/10.0	July'14 - May'18
MS in Computer Science	University of Illinois at Urbana-Champaign	GPA - 3.85/4.0	Jan'21 - May'22
PhD in Computer Science	University of Illinois at Urbana-Champaign	-	Aug'22 - Present

Work Experience

University of Illinois at Urbana-Champaign

Oct 2020 - Present

Research Assistant, Advisor: Prof. Heng Ji

Champaign, United States

- Working on projects in the areas of multimodal question answering, knowledge retrieval and claim detection in news articles. Ongoing collaborations with Amazon, IBM Research, Columbia University and UNC Chapel Hill.

IBM Research AI

Oct 2019 - Oct 2020

AI Resident, Advisors: Dr. Avi Sil, Dr. Salim Roukos

New York, United States

- Worked on projects in the areas of question answering, open-domain knowledge retrieval and AMR parsing. Contributed to five research papers (four first-author) and three patents during the AI Residency program.

Microsoft

Oct 2018 - Sep 2019

Software Engineer, Data Integration team

Vancouver, Canada

- Worked in the team that develops data connectors for [PowerApps](#), [LogicApps](#) and [Flow](#). Built the entire data pipeline for a scalable Azure-based multi-region logging infrastructure that currently handles 7 billion logs a day.

Recent Research Projects

SumREN: Summarizing Reported Speech about Events in News

Under review at AAAI 2023

Revanth Reddy, Heba Elfardy, Hou Pong Chan, Kevin Small, Heng Ji

- Proposed a new challenging task of summarizing reported speech about events in news with a **multi-document summarization benchmark**, SUMREN, that leverages GPT-3 for automatic silver-training data generation.

NewsClaims: Claim Detection from News with Attribute Knowledge

Under review at EMNLP 2022

Revanth Reddy, Sai Chetan, Zhenhailong Wang, Yi Fung, ... , Kevin Small, Heng Ji

- Proposed a new benchmark for **knowledge-aware claim detection**, that re-defines the claim detection problem to include extraction of additional background attributes related to the claim.

Research Publications

A Zero-Shot Claim Detection Framework using Question Answering [PDF](#)

COLING 2022

Revanth Reddy, Sai Chinthakindi, Yi R. Fung, Kevin Small, Heng Ji

- Proposed a **fine-grained claim detection framework** that leverages zero-shot question answering using directed questions to solve a diverse set of sub-tasks such as topic filtering, claim object detection and claimer detection.

Entity-Conditioned Question Generation for Robust Attention Distribution in Neural IR [PDF](#)

SIGIR 2022

Revanth Reddy, Arafat Sultan, Martin Franz, Avi Sil, Heng Ji

- Proposed an **entity-conditioned data augmentation** strategy that generates questions about sparsely-attended entities in the passage, to help improve neural IR models by learning to distribute attentions over the passage.

Towards Robust Neural Retrieval Models with Source Domain Synthetic Pre-Training [PDF](#)

COLING 2022

Revanth Reddy, Vikas Yadav, Arafat Sultan, Martin Franz, Vittorio Castelli, Heng Ji, Avi Sil

- Improved the **zero-shot performance** of state-of-the-art neural IR models on both **in-domain** and **out-of-domain** datasets by pre-training with **synthetic questions** generated automatically from raw text passages.

MuMuQA: Multimedia Multi-Hop News Question Answering via Cross-Media Grounding [PDF](#) **AAAI 2022**
Revanth Reddy, Xilin Rui, Manling Li, ... , Mohit Bansal, Avi Sil, Shih-Fu Chang, Heng Ji

- Proposed a new benchmark for **multimodal** question answering over news articles, with a novel data generation framework for generating questions that are **grounded on objects in images**.

COVID-19 Claim Radar: A Structured Claim Extraction and Tracking System [PDF](#) **ACL Demo 2022**
Manling Li, Revanth Reddy, Ziqi Wang, Yi-Shyuan Chiang, ... , Zixuan Zhang, Heng Ji

- Built a system that **automatically extracts claims** in news articles and shows a **comprehensive structured view** of such claims, with rich attributes (such as claimers and their affiliations) and associated knowledge elements (such as events, relations and entities)

Synthetic Target Domain Supervision for Open Retrieval QA [PDF](#) **SIGIR 2021 (poster)**
Revanth Reddy, Bhavani Iyer, Arafat Sultan, ... , Vittorio Castelli, Radu Florian, Salim Roukos

- Leveraged an **automatic text-to-text generation** idea to improve the performance of state-of-the-art open-domain **end-to-end** question answering systems in a specialized domain, such as COVID-19.

InfoSurgeon: Information Consistency Checking for Fake News Detection [PDF](#) **ACL 2021**
Yi Fung, Chris Thomas, Revanth Reddy, ... , Shih-Fu Chang, Kathleen McKeown, Mohit Bansal, Avi Sil

- Proposed a cross-media **fake news detection** system that identifies misinformation at the **knowledge element level**, with improvements in detection accuracy and better model interpretability.

Leveraging AMR for Knowledge Base Question Answering [PDF](#) **Findings of ACL 2021**
Pavan Kapanipathi, Ibrahim Abdelaziz, ... , Revanth Reddy, ... , Shrivatsa Bhargav, Mo Yu

- Proposed a **neuro-symbolic question answering system** that leverages AMR for **question understanding** and uses a pipeline-based approach involving a semantic parser, entity linkers and a neuro-symbolic reasoner.

Multi-Stage Pre-training for Low-Resource Domain Adaptation [PDF](#) **EMNLP 2020**
Revanth Reddy*, Rong Zhang*, Arafat Sultan, ... , Avi Sil, Todd Ward, Radu Florian, Salim Roukos

- Proposed **synthetic pre-training** objectives by using structure in unlabeled text, that can transfer to downstream tasks with considerable gains in the **IT Domain**.

Answer Span Correction in Machine Reading Comprehension [PDF](#) **Findings of EMNLP 2020**
Revanth Reddy, Arafat Sultan, Rong Zhang, Efsun Kayi, Vittorio Castelli, Avi Sil

- Proposed an approach for **correcting partial match answers** ($EM=0$, $0 < F1 < 1$) into exact match ($EM=1$, $F1=1$) and obtained upto **1.3%** improvement in both monolingual and multilingual evaluation.

Pushing the Limits of AMR Parsing with Self-Learning [PDF](#) **Findings of EMNLP 2020**
Revanth Reddy*, Young-suk Lee*, Ramon Astudillo*, Tahira Naseem*, ... , Salim Roukos

- Proposed **self-learning approaches** via generation of synthetic text and synthetic AMR as well as refinement of actions from the oracle, achieving **state-of-the-art** performance on benchmark AMR 1.0 and AMR 2.0 datasets.

Multi-Level Memory for Task Oriented Dialogs [PDF](#) **NAACL 2019 (poster)**
Revanth Reddy, Danish Contractor, Dinesh Raghu, Sachindra Joshi

- Designed a novel multi-level memory architecture that retains **natural hierarchy** of the knowledge base without breaking it down into **subject-relation-object** triples, with 15-25% improvement in entity F1.

A Formal Language Approach for Generating Graphs [PDF](#) **SDM 2019 (oral, poster)**
Revanth Reddy, Rahul Ramesh, Ameet Deshpande, Mitesh Khapra

- Proposed a graph generative model based on **probabilistic edge replacement** grammars and designed an algorithm to build graph grammars by capturing the statistically significant **sub-graph patterns**.

FigureNet: A Deep Learning model for Question-Answering on Scientific Plots [PDF](#) **IJCNN 2019 (oral)**
Revanth Reddy*, Sarath Chandar*, Balaraman Ravindran

- Designed a modular network for **visual reasoning** on scientific plots, achieving state-of-the-art accuracy on **FigureQA** dataset (Maluuba-Microsoft), bettering **Relation Networks** (Google DeepMind) by **6.96%**.

Internships

Allen Institute for Artificial Intelligence

Research Intern, AllenNLP team

Summer 2022

Seattle, United States

- Worked on pre-training strategies for domain adaptation of neural information retrieval models.

Amazon Alexa

Applied Scientist Intern, Alexa Web Information team

Spring 2022

Seattle, United States

- Worked on summarizing reported speech about events in news and introduced a new benchmark, SumREN, with an automatic training data generation strategy (Under review at AAAI 2023).

IBM Research AI

Research Intern, Watson Conversations team

Summer 2018

New Delhi, India

- Worked on better neural memory architectures for improving the performance of task-oriented dialog systems. My work during the internship was published as a long paper at NAACL 2019.

Microsoft India Development Center

Research Engineering Intern, Cortana Personalization Team

Summer 2017

Hyderabad, India

- Analyzed user behaviour patterns based on user temporal data and developed a model for forecasting user activity given the past history.

MyAlly.ai

Summer Intern

Summer 2016

Hyderabad, India

- Worked on named entity recognition for an automated customer meeting scheduler and built the backend for an email interface, similar to gmail, that can support accounts from multiple domains.

Patents

Method for Improving Models that convert Natural Language to Formal Language

Filed with IBM Research

Improving Model Performance through Text-to-Text Transformation via Distant Supervision

Filed with IBM Research

Method for Answer Span Correction

Filed with IBM Research

Scholastic Achievements

- Awarded the Siebel Scholarship for the class of 2022. ([Link](#))
- All India Rank - 127 in JEE Advanced 2014, taken by more than 1.3 million students.
- Shortlisted among the top 32 in India from engineering stream for Aditya Birla Scholarships 2014.
- All India Rank - 44 in KVPY 2012, taken by close to 200,000 students.
- Topped the Chennai center in Mimamsa 2017 prelims, an All India Science Quiz held by IISER Pune.

Extra-Curricular Activities

- Won bronze medal in badminton in Schroeter (Inter-hostel Sports Tournament) 2016 at IIT Madras.
- Reviewed papers as part of the program committee for multiple top-tier academic conferences such as EMNLP, KDD.
- Taught mathematics to middle-school students in Chennai as a part of National Social Service's Math Teach 2016.

Positions of Responsibility

- Led the sponsorship team for Exebit 2018, annual fest of the computer science department at IIT Madras.
- Organized year-round training sessions as captain of the hostel badminton team for the year 2016-2017.
- Member of the web-operations team for Saarang 2015, annual cultural fest of IIT Madras.