Revanth Gangi Reddy

AI Resident, IBM Research New York

✉ g.revanthreddy111@gmail.com • gangiswag.github.io

Education

Bachelor of Technology, Computer Science	Indian Institute of Technology Madras	CGPA - 9.16/10	2014-2018

Work Experience

IBM Research **Oct 2019 - Present**
AI Resident, Multilingual NLP team *New York*

- Working on improving **closed-domain question answering** systems using transformer based models.
- Working on releasing a state-of-the-art AMR parser for use by other IBM-internal teams.

Microsoft Vancouver **Oct 2018 - Sep 2019**
Software Engineer, Data Integration team *Vancouver*

- Part of the team responsible for developing connectors that are used in PowerApps, LogicApps and Flow.
- Set up the entire data pipeline for an Azure-based **multi-region** logging infrastructure that currently handles **7 billion** logs a day.
- Developed a tool for auto-generating documentation from API swagger for **seamless updating** of docs.

Internships

IBM Research AI **Summer 2018**
Research Intern, Watson Conversations team *New Delhi*
Deep Learning, Natural Language Processing

Worked on improving the performance of **task-oriented dialog** systems. My work during the internship was accepted at NAACL 2019.

Microsoft India Development Center **Summer 2017**
Research Engineering Intern, Cortana Personalization Team *Hyderabad*
Machine Learning

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

MyAlly.ai **Summer 2016**
Summer Intern *Hyderabad*
Django developer, Machine Learning

Worked on an automated customer meeting scheduler that interfaces with the customer via an email assistant. Developed the backend for an email interface, similar to gmail, that can support **accounts from multiple** domains.

Publications

Multi-Level Memory for Task Oriented Dialogs PDF **May - Aug 2018**
Accepted as a conference paper (poster) at NAACL 2019

- Designed a novel multi-level memory that retains the **natural hierarchy** of KB results without breaking them down into **subject-relation-object** triples.
- Proposed the usage of **separate memories** for context and KB to learn different memory readers.
- Obtained **15-25%** increase in entity-F1 and BLEU scores over current state-of-the-art approaches.

A Formal Language Approach for Generating Graphs PDF **Aug 2017 - Jan 2018**
Accepted as a conference paper (oral, poster) at SDM 2019

- Proposed a graph generative model based on **probabilistic edge replacement grammars**.
- Designed an algorithm to capture the statistically significant **sub-graph patterns** by introducing a novel class of graphs.
- The model generates graphs with better graphlet correlation distance (upto **7.9%**) than current approaches.

FigureNet : A Deep Learning model for Question-Answering on Scientific Plots PDF **Jan - May 2018**
Accepted as a conference paper (oral) at IJCNN 2019

- Created a modular network comprising **depth-wise** and 1D convolutions for **visual reasoning** on scientific plots.
- Achieved state-of-the-art accuracy on **FigureQA** dataset (Maluuba-Microsoft), bettering **Relation Networks** (Google DeepMind) by **6.96%**, with a training time over an order of magnitude lesser.

Selected Course Projects

A Generative Adversarial Network based approach to Language Modelling PDF **Aug-Dec 2017**
- Improved BLEU score by **4 points** by using reinforcement learning on top of the maximum likelihood training.
- Reduced the variance in gradient updates by using the **Advantage Actor-Critic (A2C)** formulation.
- Employed **fused updates** to overcome unstable training dynamics by starting with **Monte-Carlo** updates and shifting to parameterised value function midway.

Transliteration using Deep LSTM Networks (Deep Learning course) **April 2017**
- Implemented a sequence to sequence network for **phonetic translation** of words in English to Hindi.
- Improved translation accuracy by **6%** by incorporating attention mechanism and bi-directional LSTM encoder.

Deep CNNs for Image Data Classification (Deep Learning course) Report **March 2017**
- Implemented a variation of the VGG-Network for image classification on the CIFAR-10 dataset.
- Used **guided backpropagation** to discover interesting patterns in intermediate convolution layers.

Speech based editor (Course project) **Sep-Oct 2016**
- Developed an editor that translates speech to code for MiniJava, a subset of Java.
- Applied **context-free grammars** to develop features like **auto-completion** and contextual interpretation.

Attendance via images (Course project) **Jan-Mar 2017**
- Developed a Django web application to ease the process of collecting attendance in educational institutions.
- Used **face recognition** to identify individual students from images of the class.

Scholastic Achievements

- **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.

Course Work

- Deep Learning
- Machine Learning
- Applied Cryptography
- Topics in Deep Learning
- Computer Networks
- Differential Equations
- Reinforcement Learning
- Data Structures and Algorithms
- Linear Algebra & Numerical Analysis

Skills and Interests

- Interests: Deep Learning, Machine Learning and Natural Language Processing
- Languages: Python, C, C#, Java, Ruby, HTML, CSS, JQuery
- Machine Learning Libraries: Pytorch, Tensorflow, Keras, scikit-learn
- Tools and Frameworks: Django, Rails, Docker, Git, AngularJS

Extra-Curricular Activities

- Won bronze in badminton in Schroeter (Inter-hostel Sports Tournament) 2016.
- Topped the Chennai center in Mimamsa 2017 prelims, an All India Science Quiz held by IISER Pune.
- Taught mathematics to middle-school students as a part of National Social Service's Math Teach 2015-2016.

Positions of Responsibility

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