RISHUBH SINGH

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Education

Indian Institute of Technology, Delhi   **July 2014 – May 2019**

Bachelor of Technology in Computer Science   *GPA 8.95/10*
Master of Technology in Computer Science   *GPA 8.23/10*

Research Experience

Google Research India   **September 2020 – Present**

Pre-Doctoral Researcher   *Bangalore, India*

- Member of the CogML team : working on problems at the intersection of machine learning, perception and cognition.
- Creating intuitive algorithms with inspiration from human cognition for object-part segmentation in the wild to achieve SoTA on public datasets like PASCAL Part.
- Researching the applications of variants of Neural Architecture Search in task agnostic continual learning.
- Modeling behavioral priors into deep neural networks to create robust and interpretable image classification models.

Indian Institute of Technology, Delhi   **July 2018 – April 2019**

Master's Thesis   *New Delhi, India*

- Analyzed neural nets that are structurally and biologically more plausible and replicate human behaviour.
- Compared various recurrent models like EIRNNs, LSTMs, RNNs against human performance to better understand cognition on high level tasks like learning subject-verb agreement.
- Showed that vanilla RNNs are significantly inferior to LSTMs on tasks like learning grammaticality.
- Showed that no one recurrent architecture performs best at all/most types of sentences.
- Proposed a new model : Decay RNN which is biologically more plausible while performing almost at par with LSTMs.
- Paper accepted at the ACL Student Workshop 2020.

Indian Institute of Technology, Delhi   **February 2018 – May 2018**

Character Based Sentiment Analysis : NLP Course Project   *New Delhi, India*

- Finding the sentiment and word understanding capability of a neural network with only character sequence information.
- Achieved SoTA accuracies on multiple datasets using character BiLSTMs, CNNs and their combinations.

Indian Institute of Technology, Delhi   **May 2016 – February 2017**

Summer Undergraduate Research Award   *New Delhi, India*

- Parallelized a Dynamic Verification Engine (INSPECT) that verifies parallel programs for correctness.
- Parallelized the dynamic partial order reduction algorithm using parallel depth first search algorithm.
- Used MPI and workload sharing to achieve an efficient optimization reducing runtime by upto 5 times.

Publications

How much complexity does an RNN architecture need to learn syntax-sensitive dependencies?

Rishubh Singh, Gantavya Bhatt, Hritik Bansal, Sumeet Agarwal
Accepted for poster presentation at the ACL Student Workshop 2020.

Engineering Experience

Graviton Research Capital LLP   **July 2019 – August 2020**

Software Engineer   *Gurgaon, India*

- Focused on code optimization at the compiler, OS and hardware levels to ensure the fastest processing of market events.
- Responsible for writing and maintaining the backend of four markets traded by the company.
- Experienced in navigating complexities and setting up the backend for new markets.

Google   **May 2018 – August 2018**

Software Engineering Intern   *Mountain View, USA*

- Designed and created an API to generate customizable images/videos given camera specifications and orientation from Street View data.
- Parallelized the internals of data generation of the API using Flume obtaining a 10x increase in efficiency.
- Synthesized videos (over 100GBs) are supplementing existing collected data and are being used to train and test internal algorithms and ML models at scale.

Google   **May 2017 – July 2017**

Software Engineering Intern   *Mountain View, USA*

- Built a system to filter false on-call escalations and remove noise from the feedback and monitoring system.
- Improved the ad serving system to reduce the loss of ad impressions, having direct revenue impact.
- Worked with external (to Google Fiber) API's, DFP (Ad server), Spanner(large scale database) and a pipeline based task processing system.

Selected Achievements

Competitive Coding

- Qualified for ACM-ICPC Amritapuri Regional 2015 and secured 71st rank in India.
- National Top 25 in Indian National Olympiad in Informatics(INOI), selected and participated in International Olympiad in Informatics(IOI) Training Camp 2013 and 2014.

Scholastic Achievements

- National Top 40 in Indian National Astronomy Olympiad(INAO) and attended the Astronomy Orientation Camp in 2014. Top 300 in 2010 and 2011 in the same.
- Scholarship under National Talent Search Examination(NTSE) - 2010 by Govt. of India.
- National Rank 36 and fellowship under Kishore Vaigyanik Protsahan Yojana(KVPY)(Young Scientist Program) - 2013 conducted by IISc Bangalore and Govt. of India.

Extra Curricular

- Attended a semester (5th) exchange to the prestigious KTH Royal Institute of Technology, Stockholm, Sweden.
- Selected for the JENESYS program among Top 10 students from CISCE schools. A 10 day cultural exchange initiative between the Ministries of Foreign Affairs' of India and Japan.