Amrit **Singhal**

MASTER OF SCIENCE IN MACHINE LEARNING · CARNEGIE MELLON UNIVERSITY

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Education

Carnegie Mellon University *Pittsburgh, PA, USA*
MASTER OF SCIENCE IN MACHINE LEARNING *Aug 2019 - Dec 2020 (Expected)*
- **GPA: 4.11**

Indian Institute of Technology Kanpur *Kanpur, India*
BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING *Jul 2015 - May 2019*
- **GPA: 9.7/10.0**. Awarded the Academic Excellence Award for 2015-2016, 2016-2017 and 2017-2018.

City Montessori School *Lucknow, India*
INDIAN SCHOOL CERTIFICATE EXAMINATION (INTERMEDIATE), CISCE INDIA *2015*
- **Overall Percentage: 97.5%**.

Skills

Programming	*Advanced*: **Python**, *Intermediate*: C/C++, Bash Scripting, *Basic*: JAVA
Libraries	Tensorflow, PyTorch, Keras, Scikit-learn, ARCore, OpenAI Gym, NumPy
Softwares and Tools	Latex, Unity3D, Matlab, SQL, MongoDB, Android Studio
Languages	English(Fluent), Hindi(Native Speaker)

Work Experience

BEL Research Lab, Adobe *Bangalore, India*
RESEARCH INTERNSHIP *May 2018 - Jul 2018*
- Developed a novel end-to-end interface to allow easy authoring of Augmented Reality experiences from natural language input
- Introduced novel methods for scene graph augmentation that allowed inference of objects for the surroundings.
- Utilized multiple NLP techniques such as scene graph parsing, co-reference resolution, clause splitting, and many others, and implemented multiple MLP networks for the multiple learning tasks involved in the pipeline.
- Designed a Unity3D application, using the ARCore library from Google, to present the AR output.
- **PUBLICATION** ARComposer: Authoring Augmented Reality Experiences through Text
  UIST '19 - The Adjunct Publication of the 32nd Annual ACM Symposium on User Interface Software and Technology
- **PATENT** Visualizing Natural Language through 3D Scenes in Augmented Reality; US16/247235; Filed Jan 2019

Hike Private Limited *New Delhi, India*
MACHINE LEARNING DEVELOPMENT INTERNSHIP *May 2017 - Jul 2017*
- Developed and tested multiple neural network models, including CNNs, RNNs and LSTM networks, using Tensorflow to assign an emotion to any input text, achieving near state-of-the-art accuracy.
- Developed a Language-Classifier to segregate a collection of chats in Latin script into the different languages.

Relevant Coursework

GRADUATE

Ongoing	Advanced Deep Learning, Probabilistic Graphical Models, Advanced Machine Learning
Completed	Deep Reinforcement Learning and Control (**A+**), Introduction to Machine Learning (A), Probabilty and Statistics (A)

UNDERGRADUATE

Machine Learning	Probabilistic Modelling and Inferences, Introduction to Machine Learning, Natural Language Processing, Computational Cognitive Science, Visual Recognition
Other	Information Retrieval, Database Management Systems, Advanced Algorithms, Computer Networks Data structures and Algorithms, Probability and Statistics

Research Experience and Projects

NYC Taxi Travel Time Prediction through Leveraging Geographical Information
CMU
COURSE PROJECT: 10-701 INTRODUCTION TO MACHINE LEARNING *[Report] [Code]* *Aug 2019 - Dec 2019*
- Introduced a method of leveraging known geographical separations to better estimate travel times in New York city
- Developed multiple models using XGBoost trees and ensemble neural networks, and combined them to give total prediction

Query Dependant Multi-Document Summarization
Department of CSE, IIT Kanpur
UNDERGRADUATE PROJECT, PROF. ARNAB BHATTACHARYA *[Report] [Code]* *Aug 2018 - Dec 2018*
- Devised a novel pipeline to perform faster query-biased multi-document abstractive summarization.
- Examined and salvaged multiple techniques together for efficient passage retrieval incorporating the query bias.
- Analyzed existing methods for abstractive summarization through seq2seq networks, pointer-generator networks and reinforcement learning based models, and added a query bias to the summarisation techniques.

Cross Modal Media Retrieval
Department of CSE, IIT Kanpur
UNDERGRADUATE PROJECT, PROF. MEDHA ATRE *[Code]* *Jan 2018 - May 2018*
- Utilized the emotional information present in images and audios to perform cross-modal media retrieval.
- Implemented a neural network model to extract emotion values from images using the circumplex model.
- Proposed and developed two approaches to transfer the information from different modalities into the same space - a statistical approach using Procrustes analysis, and a joint learning approach using a non-linear loss function.

Machine Translation for Low Resource Languages
IIT Kanpur
COURSE PROJECT: NATURAL LANGUAGE PROCESSING *[Report]* *Jan 2018 - May 2018*
- Performed literature review on the existing methods of Neural Machine Translation using parallel and non-parallel corpora.
- Implemented the state-of-the-art work using non-parallel corpora, and trained it on English and Catalan(Low resource language).

Recommend a Reviewer
IIT Kanpur
COURSE PROJECT: INTRODUCTION TO MACHINE LEARNING *[Report] [Code]* *Aug 2017 - Dec 2017*
- Surveyed various techniques for automated paper-reviewer assignment like the Toronto Paper Matching System, and the Robust Paper-Reviewer Assignment Model, and implemented multiple modifications over them.
- Implemented an alternating optimization approach for completing the matrix of relevance scores between papers and authors.

Quantum Machine Learning
IIT Kanpur
COURSE PROJECT: QUANTUM COMPUTING*[Report]* *Aug 2017 - Dec 2017*
- Understood the quantum methods and their complexity speed-ups in the quantum implementations of the Perceptron Model and the nearest neighbour methods, provided by Wiebe, Kapoor and Svore.
- Understood various variants of the kNN method, using various distinct and non-equivalent metrics like inner product and Hamming distance, and the relations between them.

Awards & Achievements

2016-2018	**Academic Excellence Award**, 3 consecutive years, Department of Computer Science and Engineering	*IIT Kanpur*
2015	**All India Rank 1**, SCRA Examination among 160,000 candidates	*India*
2015	**All India Rank 322**, Joint Entrance Examination (IIT-JEE) among 1.3 million candidates	*India*
2015	**All India Rank 5**, Uttar Pradesh State Entrance Examination (UPSEE) among 160,000 candidates	*India*
2015	**Indian National Chemistry Olympiad Awardee**, for being among nationwide top 35 candidates	*India*
2015	**Nationwide Top 1%**, National Standard Examinations in Chemistry and Physics	*India*
2015	**INSPIRE Fellowship Awardee**, Awarded by Govt of India for being in Top 1% in ISC-2015 Examination	*India*
2013	**KVPY Scholarship Awardee**, Indian Institute of Science and Government of India	*Bangalore*

Other Activities

2020	**Teaching Assistant**, Deep Reinforcement Learning and Control	*CMU*
2019	**Tutor**, Introduction to Computing	*IIT Kanpur*
2018	**Teaching Assistant**, Data Structures and Algorithms	*IIT Kanpur*
2016-17	**Academic Mentor**, Counselling Service	*IIT Kanpur*
2016-17	**Student Guide**, Counselling Service	*IIT Kanpur*