Dhruv Kumar

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EDUCATION

University of Waterloo, Ontario, Canada — Sep 2018- Present
M. Math.(Thesis) in Computer Science — GPA: 88.5 / 100
Coursework- Deep Learning, Trust Modeling and Online Social Networks, Blockchains: Foundations and Applications

Indian Institute of Information Technology, Allahabad, U.P., India — Jul 2012- Jun 2016
B. Tech.(Hons) in Information Technology — GPA: 8.68 / 10.00 (9.07 - Last 2 years)
Relevant Coursework- Information Retrieval, Artificial Intelligence, Natural Language Processing, Cognitive Process Modelling, Optimization Techniques, Data Mining, Probability & Statistics, Mathematics(I, II, III).

RESEARCH EXPERIENCE

University of Waterloo,
Research Assistant/Sirius Blockchain Research Group — Jan 2019-Present
- As part of the course project working on creating an efficient Data Management layer on top of Hyperledger Fabric to enable it to handle more complex use-cases like consent management in Healthcare than simply cryptocurrencies.
  [Teammate: Rishav Agarwal; Supervisors: Prof. Srinivasan Keshav, Prof. Lukasz Golab]

Research Assistant/Data Science Lab — Nov 2018-Present
- Using Natural Language Processing (NLP) to measure toxicity, aggressiveness and incivility in online social networks.
  [Supervisors: Prof. Robin Cohen, Prof. Lukasz Golab]

Teaching Assistant
- CS 115: Introduction to Computer Science, Fall 18.
- CS 230: Introduction to Computers and Computer Systems, Winter 19

Universität Paderborn, Paderborn, Germany — Jan 2016-Jun 2016
Studentische Hilfskraft (Student RA) at Analytic Information Systems and Business Intelligence Lab (AIS-BI)
- **Bachelor's Thesis**: "Compressed Knowledge transfer via Factorization Models in Recommender Systems". Developed an algorithm to incorporate metadata in Factorization Machines, thus improving their accuracy.
  [Supervisors: Dr. Artus Krohn-Grimberghe, Prof. Ratna Sanyal]
- Face recognition in videos: built a web application on top of Microsoft's Project Oxford.
  [Supervisor: Dr. Artus Krohn-Grimberghe]

INDUSTRY EXPERIENCE

Arcesium(DE Shaw Group), Hyderabad, India — Jul 2016-May 2018
Software Engineer
- Worked as a full stack engineer, designing Fund and Investor Accounting solutions for Hedge Funds.
- Member of the team to onboard J.P.Morgan onto the platform.

Citigroup, Pune, India
Software Engineering Intern — May 2015-Jul 2015
- Trading Controls application for Equities Team using MEAN stack and d3. Received a full-time offer.

PUBLICATIONS

- "Inclusion of Semantic and Time-Variant Information Using Matrix Factorization Approach for Implicit Rating of Last.Fm Dataset," in *Springer Berlin Heidelberg - Arabian Journal of Science and Engineering* May 2016.

ADDITIONAL PROJECTS

Visual Question Answering — Jan 2019 - Present
- Working with the VQA v2.0 dataset. The work till now has been to understand the components of the current state-of-the-art methods. Moving forward we first try to reproduce the results of a selected model and further building on it to get improvements.
- Teammates: Amirpasha Ghabussi

Text classification using Deep Learning
Dec 2018 - Jan 2019
- Implemented deep learning methods including multiple attention models for text classification in Pytorch. The models are inspired not just by the state-of-the-art in classification but also by different tasks in NLP such as text entailment, Question Answering, etc.

Bi-Directional Attention Flow for Question Answering
Sep 2018 - Nov 2018
- Implemented the Bi-Directional Attention Flow(BiDAF) model from scratch in Tensorflow over the SQuAD1.1 dataset as part of the course project for the Deep Learning class.
- Teammates: Amirpasha Ghabussi, Gaurav Sahu, Kashif Khan; Supervisor: Prof. Ali Ghodsi

Transfer Learning for Image Classification
Oct 2018
- Trained ResNet50 and VGG16 models on Cifar100 to obtain an accuracy of 78.53%.
- Supervisor: Prof. Ali Ghodsi

RL agents on OpenAI Gym
Aug 2017 - Dec 2017
- Applied Reinforcement Learning methods like Policy Gradient and Q-Learning with Neural Networks to learn Open Gym environments like Cartpole, MountainCar and Pong.

Learning the writing style
Apr 2017 - May 2017
- Implemented a character level RNN model from scratch which learns writing style from my Bachelor's Thesis.

Analysis of Time Aware and Semantic Feature Based Music Recommender System
Jul 2015 - Nov 2015
- Proposed a semantic-Joint Matrix Factorization approach to incorporate semantic(geographic) and time based information for items in addition to user's implicit feedback to enhance the accuracy of the model.
- Teammates: Shubham Mehrotra, Ronish Kalia, Nidhi Kushwaha; Supervisor: Prof. O.P. Vyas

Information Extraction and Sentiment Analysis
Jul 2014 - Nov 2014
- Applied NLP and graph propagation algorithms to predict and rate five most popular features of any item using Amazon user reviews which were filtered through a Naïve Bayes spam filter.

Android Application for Effervescence 2014
May 2014 - Aug 2014
- Lead a team to design and develop the first ever *Android Application* for our annual festival Effervescence.

Faculty Feedback Portal
Jan 2013 - Apr 2013
- Developed an institute wide web based application where students could anonymously give feedback about faculty, replacing the existing offline activity. Graphically summarized the feedback for the faculty to view.

SKILLS

Languages- C, C++, Python, Java, Javascript, HTML, PHP and SQL.
Libraries- Pytorch, Tensorflow, Keras, Gym, Scikit-Learn, Pandas, and d3.js
Frameworks- AngularJS, Node.js, MongoDB, Flask, Spring, MyBatis and Struts

ACHIEVEMENTS & EXTRA-CURRICULAR
- Got accepted for the Deep Learning and Reinforcement Learning Summer School, 2019. Acceptance Rate of less than 25%
- Received International Masters Student Award and University of Waterloo Entrance Scholarship for graduate studies.
- Stood in the top 0.5% in the All India Engineering Entrance Examination 2012.
- Worked as the Events Head of the annual cultural cum technical festival *Effervescence* 2014.
- Represented the college band as a drummer in various events.