Anup Anand Deshmukh

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EDUCATION

University of Waterloo, Canada (UW) *Sept 2019-Present*

Degree	Master of Mathematics in CS (thesis)
GPA	97/100 (A+)
Supervisor	Prof. Ming Li
Coursework	Optimization for Data Science, Machine Learning, Deep Learning for NLP and Information Retrieval
Teaching Assistant	CS 115, Introduction to Computer Science (Fall 2019)

International Institute of Information Technology, Bangalore (IIIT-B) *Aug 2014-July 2019*

Degree	Integrated Masters in Information Technology
CGPA	Overall: 3.32/4, Theoretical CS Major: 3.63/4
Coursework	Advanced Machine Perception, Data Structures and Algorithms, Linear Algebra
Teaching Assistant	CS 302, Theory of Automata and Computations (Fall 2018) SP 825, Visual Recognition (Spring 2019)

INTERESTS

Machine Learning for Recommender Systems, NLP and Computer Vision

PUBLICATIONS

Anup Deshmukh, Pratheeksha Nair, Shrisha Rao,**"A Scalable Clustering Algorithm for Serendipity in Recommender Systems,"** *ICDM 2018 workshop - SAREC [Paper] [Code]*

- Effectuated serendipity in movie recommender systems with an algorithm, Serendipitous Clustering for Collaborative Filtering (SC-CF) that also efficiently tackles the problem of high sparsity.

Rameshwar Pratap, **Anup Deshmukh**, Pratheeksha Nair, Tarun Dutt, **"Fast and Provable Concept Decompositions in Large Text Corpus,"** *ACML 2018 conference [Paper] [Code]*

- Proposed an algorithm by considering the spherical clustering problem for large sparse document collections. Proved that, with our approach the computational complexity in SPKM++ can be decreased while retaining the $\mathcal{O}(\log k)$ approximation guarantee to the optimal clustering result.

RESEARCH EXPERIENCE

ContentNCF: Content Based Neural Collaborative Filtering *August 2019-Present*
Course: Machine Learning at UW *Guide: Prof. Yaoling Yu*

- Extended Neural Collaborative Filtering (NCF), to content-based recommendation scenarios and presented a CNN based collaborative filtering approach tailored to image recommendation.
- ContentNCF with the best parameter setting achieves HR and NDCG of 0.940 and 0.582 resp for the task of top-K recommendation.

A Generative Adversarial Network for Diversity in Recommender Systems *July 2019*
Masters Thesis: Multimodal perception lab at IIIT-B *Guide: Prof. Dinesh Babu*

- Proposed a Generative Adversarial Network (GAN) which exploits Reinforcement Learning (RL) to give diverse yet relevant recommendations. Achieved 77% of intra-list diversity in recommendations.

Scaling up Simhash *(Under review in top AI conference)* *Jan 2018-Aug 2018*
Independant work at IIIT-B *Guide: Prof. R. Pratap*

- Proposed a dimensionality reduction sketching algorithm - simsketch - which maintains an estimate of the cosine similarity between original real valued vectors.
- In the task of all-pair-similarity search we show that Simsketch significantly outperforms Simhash for higher threshold values on the precision-recall measure.

PROJECTS

Perception of Emotions from Audio Signals *May 2018-Oct 2018*
Internship: FAST lab at CentraleSupelec, France [Report] [Code] *Guide: Prof. Renaud Seguier*

- Analyzed different set of acoustic features which are designed to detect the perceptual content of audio with CNNsin focus. Proposed Emo-CNN achieved 90.20% of categorical accuracy.

Merge LSTM model for Image Description Generation *August 2017-April 2018*
Course: Research Elective at IIIT-B [Report] [Code] *Guide: Prof. Dinesh Babu*

- Built the deep model using Keras on the construction which uses both LSTMs for language modelling and CNNs for generating image representation. Achieved BLEU score of 0.51.

Automated Essay Scoring with Cross Feature Vector Generation *August 2017-Dec 2017*
Course: Machine Learning at IIIT-B [Report] [Code] *Guide: Prof. G Srinivasa R.*

- Designed and implemented the Intelligent Text Rater (ITR) with the proposed novel approach of feature vector generation of text essays. ITR achieved MSE as low as 0.73 for essay ratings.

SKILLS

Languages	Python, C++, JScript
Tools	Keras, TensorFlow, Matlab, Latex

ACHIEVEMENTS & LEADERSHIP

2017 **Speaker**, TEDx pre-event IIIT-B, **Co-Founder**, IIIT-B 'Comic Club'
2016 Winner of the Hackathon held in IIIT-B as part of the Signal Processing course
2016 Designed and created an Intellectual Property Management Portal for IIIT-B.
2014 Top 1% in Maharashtra State's Higher Secondary School Certificate (HSC) exam