Avinash Swaminathan

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EDUCATION

Netaji Subhas Institute of Technology	New Delhi, India
Bachelor of Engineering in Information Technology, CGPA - 9.21 / 10	*Aug. 2017 – May 2021*
Delhi Public School, R.K.Puram	New Delhi, India
Std. 12, Science with Computer Science, Board Percentage - 96.4 / 100	*May 2015 – May 2017*

SUMMARY

Research Interests: Natural Language Processing, Information Extraction and Retrieval, Reinforcement Learning
Coursework: Computer Programming, Data Structure and Algorithms, Design and Analysis of Algorithms, Computer Architecture, Computer Networks, Operating System, Soft Computing, Linux and Unix Lab, Cryptography
Languages: Python, C/C++, C#, JavaScript, Swift

EXPERIENCE

Software Engineering Intern — May 2020 – July 2020
Microsoft India Development Center — *Hyderabad, India*

- Interned at the **Microsoft Dynamics 365** Common Data Services team
- Developed **data service features for time of creation** in the Dynamics 365 CRM Tool
- **UI, production tested code changes and deployed** features to production

Undergraduate Research Intern — June 2019 – Present
Multimodal Digital Media Analysis Lab, IIITD — *New Delhi, India*

- Advised by *Dr.Debanjan Mahata*, **Research Scientist at Bloomberg, New York** and *Prof. Rajiv Ratn Shah*, **Assistant Professor at IIITD**
- Internship work includes application of GANs for keyphrase generation, Natural Language Inference tasks for datasets in low-resource languages and code-switched conversation summarisation

RESEARCH PROJECTS

Keyphrase-GAN [Code] — Jun 2019 – May 2020

- Developed a **conditional-GAN architecture** to generate keyphrases from scientific abstracts
- Designed a **hierarchical attention based discriminator** to distinguish between true and false keyphrases
- Proposed Model **surpassed SOTA in generating absent keyphrases** on *NUS, Kp20k, Krapivin* datasets
- Work accepted to **AAAI 2020** as student abstract and **EMNLP 2020** main track.

Gender classification using Facial Embeddings — Jan 2019 – May 2019

- Proposed a novel approach to **classify gender using Facial Embeddings** obtained from FaceNet network
- **Applied classical ML techniques** like KNN, Random forests, SVMs on Facenet Embeddings
- Facenet+KNN model **obtained f1 score of 0.97** beating all the current SOTA methods on *UTK faces Dataset*
- Work accepted to **ICCIDS 2019** as full paper and published in Procedia CS Journal.

Two-Level Classification using Recasted Data [Code] — March 2020 – August 2020

- Developed a **two-step classification method that uses textual-entailment predictions** for Hindi classification tasks
- Used data recasting to **create NLI datasets** for classification tasks and **address data scarcity** in low-resource languages
- Work accepted to **AACL-IJCNLP 2020** as full paper.

RLRoute: Online GNN-based Routing Scheme for SDNs — Sept 2020 – Present

- Designed and implemented a **GNN-based online routing scheme for Software-Defined Network** which minimized average delay for packets.
- GNN was trained **using experience replay** from the experiences learnt by the SDN controller.
- Proposed algorithm **performed better than conventional routing algorithms** like shortest path and Q-routing algorithms w.r.t to average delay, packets dropped, etc.

Publications

1. **Avinash Swaminathan**, Mridul Chaba, Deepak Kumar Sharma,and Yogesh Chaba. **Gender Classification using Facial Embeddings: A Novel Approach.** Procedia Computer Science, 167:2634 – 2642, 2020. International Conference on Computational Intelligence and Data Science. [Paper] [Slides]

2. **Avinash Swaminathan**, Haimin Zhang, Debanjan Mahata, Rakesh Gosangi, Rajiv Ratn Shah, and Amanda Stent. **A preliminary exploration of GANs for keyphrase generation**. In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP), pages 8021–8030, Online, November 2020. Association for Computational Linguistics. [Paper] [Slides]

3. **Avinash Swaminathan**, Raj Kuwar Gupta, Haimin Zhang, Debanjan Mahata, Rakesh Gosangi, and Rajiv Ratn Shah.**Keyphrase Generation for Scientific Articles Using GANs(Student Abstract) .** In The Thirty-Fourth AAAI Conference on Artificial Intelligence, AAAI 2020, pages 13931–13932. AAAI Press, 2020. [Paper]

4. Shagun Uppal, Vivek Gupta, **Avinash Swaminathan**, Debanjan Mahata, Rakesh Gosangi, Haimin Zhang, Rajiv Ratn Shah, and Amanda Stent. **Two-Step Classification using Recasted Data for Low Resource Settings** . In Asia-Pacific Chapter of the Association for Computational Linguistics(AACL-IJCNLP) 2020. [Paper] [Slides]

Presentation and Webinars

- **Youtube Webinar** on *FaceNet: A Unified Embedding for Face Recognition and Clustering*[Video]
- **Slideslive EMNLP Presentation** on *A Preliminary Exploration of GANs for keyphrase generation*[Video]
- **AAAI Poster Presentation** for paper *Keyphrase Generation for Scientific Articles Using GANs* [Poster]

Industrial Projects

HindiNLP [Code]   May 2020 – June 2020
- Created a python library providing **NER support to tag Hindi** sentences and **custom NER model training** for 12 different entities.
- Added support for **training models** on classification datasets using **single line of code**

Drishti.AI [Code]   Sept 2018
- Designed an **android app to assist visually disabled** in locating objects using voice commands
- Implemented a feature to **navigate urban environments** by narrating the path and guiding them within app

Tweet-o-pedia [Code]   Dec 2018 – Jan 2019
- Developed a **sentiment search website in Django** to guage public sentiment on twitter related to any search term
- Added a **hate-o-meter to gauge level of hate speech** on twitter against ethnic groups

Movieflix: Movie Recommendation System [Code]   Feb 2019 – March 2019
- Implemented a **Flask-based web application** that **recommends movies** to the customer based on his/her ratings of already watched movies
- Used **item-item, user-user collaborative filtering and rank-matrix factorization** to provide movies recommendations.

Awards and Scholarships

- Awarded **Gold Medal** by DPS Society for excellent scholastic achievement for 4 consecutive years
- Awarded 4-year **NSIT Merit Scholarship** for outstanding academic performance
- **Grand Finalist** at Smart India Hackathon 2019
- **Special Prize Winner** at Hack@BVP 2018
- Awarded **Facebook AI scholarship** to pursue Deep Learning Nanodegree
- Awarded **AAAI student scholarship** to attend AAAI 2020, NYC

Positions of Responsibility

Vice President   April 2019 – July 2020
Nakshatra - The Astronomy and Math Club of NSIT   *New Delhi, India*
- **Managed and coordinated day-to-day activities** of society like publicity of events, weekly meetings, etc.
- **Planned and organized ML competitions** for Ephemeris: society's annual fest
- **Conducted Machine and Deep Learning SIGs** for junior students