Srijay Deshpande, PhD

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Summary

I am a dedicated machine learning scientist with a proven track record of over 5 years in machine learning, deep learning, and computer vision, focusing on pioneering advancements in this field. During my tenure at the University of Warwick, I spearheaded the development of computer-vision based solutions in the domain of computational pathology and implemented cutting-edge Generative AI algorithms for tissue image generation. The results of this work were published in top-tier conferences and journals. As a Data Scientist at Microsoft, I collaborated with the Bing Ads team to improve the information retrieval performance of sponsored search by developing novel NLP techniques. My internship at Amazon further strengthened my software development skills. I am adept at learning quickly, adapting to changing circumstances, and working both independently and collaboratively.

Technical Skills

- **Core Competencies**: Large Language Models, Computer Vision, Natural Language Processing, Machine Learning, Deep Learning, Sequence Learning, Generative AI, Biomedical Informatics, Multi-modal Modelling, Medical Image Analysis, Algorithms, Information Retrieval, Competitive Programming, Computational Pathology
- **Languages**:Python, C, C++, C#, Java, Bash, Ruby, SQL
- **Framework and Tools**: Keras, Tensorflow, Pytorch, .NET, Docker, Ruby on Rails

Professional Experience

Machine Learning Consultant **April 2024 - Current**
Histofy Ltd. *Large Language Models*

- Working on analysing clinical records using large language models
- Fine-tuning LLMs for processing clinical reports

Data and Applied Scientist **July 2017 - Sept 2019**
Microsoft India *CNN, Tensorflow, C#, Python*

- Implemented neural models like CLSM and FastText to improve the performance of sponsored search on the Bing platform and deployed the models in UK, IN, and AU markets, which resulted in improved click-through rate and revenue per mile measures
- Designed novel NLP-based information retrieval model for ad hoc Ads Retrieval which improved the quality of the retrieved ads and also played a vital role in upgrading the infrastructure of the Bing Ads retrieval system
- Developed back-end APIs using .NET framework for the Small and medium businesses team under Office 365

Software Developer Intern **May 2014 - July 2014**
Amazon India *Ruby, Ruby on Rails, C++*

- Developed a web tool titled "Bulk Download Tool for CreditNotes" using Ruby on Rails to collect a large number of documents (credit notes) from storage
- The tool takes a list of document Ids as input and fetches the corresponding documents, compresses them, and returns the compressed document for downloading, in real-time

Research Experience

Machine Learning Postdoctoral Research Fellow **April 2023 - March 2024**
University of Warwick, UK *Tensorflow, Python*

- Developed biomedical informatics solutions using computer vision and generative AI techniques for the understanding and diagnosis of cancer. The research involved systematic analysis of tumors, their genomic profiling, and multi-modal data comprising of tissue samples with spatial transcriptomic profiles, protein expressions, vibrational spectroscopy and whole slide image data
- Innovated a bidirectional computer vision framework to cross-link protein expressions with H&E image features

PhD in Computer Vision **September 2019 - August 2023**
University of Warwick, UK *Tensorflow, Python*

- Developed Generative Adversarial Network based deep neural frameworks to generate high-fidelity histology images and thereby improve the prediction performance of downstream tasks like cancer detection by 4.03%, cellular composition prediction by 6.10%, and gland segmentation by 4.44%, in computational pathology (CPath), especially when available data is limited
- Showed the Generative AI framework called SAFRON can generate, to the best of our knowledge, the largest-sized synthetic histology images to date **(up to 11K×8K pixels)**.
- Built deep learning pipelines based on ResNet and Inception frameworks to process the information-rich multi-gigapixel digitized whole-slide pathology images for the tasks of tumor segmentation and HER2 status prediction in CPath
- Worked in the team for developing TIAToolBox, a toolbox for the end-to-end deployment of AI algorithms in CPath

Education

University of Warwick, UK **Sept 2019 - Aug 2023**
PhD in Computer Science *Tensorflow, Python*

- Thesis: "Generative AI for Computational Pathology"

Indian Institute of Technology, Bombay **July 2015 - July 2017**
Master of Technology in Computer Science *Tensorflow, Python*

- Thesis: "Improving Non-Compositionality Detection and Noun Compounds Relational Classification using Deep Learning"
- Grade Points: 9.52/10

Visvesvaraya National Institute of Technology, Nagpur **July 2011 - July 2015**
Bachelor of Technology in Computer Science *Tensorflow, Python*

- Thesis: "Query Optimization using Predictive View Sets"
- Grade Points: 8.8/10

Additional Selected Projects

ChatBot using Sequence-To-Sequence Deep Network **Oct 2017 - Jan 2018**
Microsoft *CNN, Tensorflow, Python*

- Designed and implemented a ChatBot for an Office 365 phone system capable of engaging in natural conversations through the utilization of a deep LSTM encoder-decoder neural network
- Trained the ChatBot on the Cornell movie dialogue corpus and obtained a decent perplexity score

Magic Paint (Neural Style Transfer based App) **Feb 2018 - Aug 2018**
Android Application *Java, Android, Tensorflow*

- Developed an android application which takes image as a input and convert it into a painting using one of the available styles of world famous painters
- The model used in the application is deep feed-forward neural generative model which is trained using the properties of convolution feature maps of inception model (google's convolution neural network for object recognition)

Honors & Awards

- Recipient of **CDT Research Scholarship** from 2019 to 2023.
- Secured **All India Rank 12** among **115K candidates** in GATE-2015
- Ranked in **top 5** among 100+ students in the MTech (masters) at IIT-Bombay
- Qualified for **ACM-ICPC Finals**, the competitive coding contest, and represented NIT-Nagpur at the onsite round
- Secured **All India Rank 3005** in **AIEEE-2011** out of more than **1.1 million** students all over country
- Awarded as **Best AURAA** (Academic Unit Representative for Academic Affairs) at IIT Bombay