ABHISHEK DEEPAK DAS

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SUMMARY

Abhishek is a seasoned Applied Scientist with extensive hands-on expertise in deep learning research, having made significant contributions to advanced projects at Microsoft and Carnegie Mellon University. Passionate about solving complex problems, he has a proven track record of developing innovative solutions in Generative and Responsible AI.

EXPERIENCE

Microsoft Corporation (Bing Search)
Applied Scientist 2 — Feb 2024 - Present (Vancouver, Canada)
Applied Scientist 2 — Sep 2022 - Feb 2024 (Redmond, USA)
Applied Scientist — Aug 2021 - Aug 2022 (Redmond, USA)

- Designed and modernized the Recall and Ranking layers for a query recommendations system (Related Searches) on SERP and Image verticals, enhancing user traffic shaping, query intent understanding and multimodal search.
- Developed (the first) Responsible AI model for Bing Image Creator to minimize bad actors from creating offensive, misinformative, detrimental Generative AI Images.
- Research on synthetic data distillation from LLMs like GPT 4 and prompt engineering practices. Training and deploying student transformer models for inference on a web-scale.
- Generate actionable insights from user sessions to identify user frustrations and device solutions to improve search experience, Conduct opportunity analysis for ads revenue growth and monetization.
- Progressed through two promotions, taking on greater tech-lead responsibilities, mentoring team members, peer-reviewing at internal conference, and collaborating with product managers to deliver impactful AI solutions.

Carnegie Mellon University — Pittsburgh, PA
Deep Learning Researcher — Feb - July 2021
Deep Learning Research Intern — May - Dec 2020

- Improving Fine-Grain Retail Product Image Classification on large noisy datasets with a long tail distribution by refining the state-of-the-art architectures; and using techniques like Attention, Balanced Sampling, Cutmix, Label Smoothing, etc.
- Collaborated with a team of four to develop a robust neural network pipeline for inventory management in retail stores.
- Deep Fake Videos Detection: Design an architecture using Convolution Neural Networks and human pulse rate features.

SKILLS

Tools: LLM/SLM Prompt Engineering, Finetuning & Preference Optimization; PyTorch; ONNX; NumPy; Linux; Scikit-learn
Programming Languages: (Advanced) Python; SCOPE; MATLAB; (Intermediate) C#

EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Electrical and Computer Engineering, GPA: 3.76/4.0 — Dec 2020
Relevant Coursework: Multimodal Machine Learning, Computer Vision, Speech Recognition

University of Mumbai — Mumbai, India
Bachelor of Engineering in Electronics and Telecommunication Engineering, GPA: 8.9/10 — May 2019
Relevant Coursework: Discrete-Time Signal Processing, Image and Video processing

PUBLICATIONS / ACADEMIC PROJECTS

Carnegie Mellon University, Pittsburgh, PA

- **Detecting Hate Speech in Multimodal Memes,** arXiv:2012.14891
  Devised Object detection-based Image Captioning to tackle the adversarial "Benign Confounders" in the challenge dataset and integrated it with a multimodal architecture comprising of BERT and ResNeXt101.
  Achieved 2% improvement in AUROC over the best multimodal baseline Visual BERT COCO; Presented our research ideas in the **NeurIPS 2020** Facebook Hateful Memes Challenge session - Contributed Talks.

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- **Multi-Image Steganography Using Deep Neural Networks,** arXiv:2101.00350
  Enhanced a Convolutional Neural Network Encoder-Decoder architecture to successfully hide three secret images within a carrier image by using feature concatenation and adding noise to the carrier image.

- **User De-Identification over Speech/Dialogue exchange,** Fall 2020
  Implemented Listen, Attend, and Spell model for Speech Recognition to achieve a WER of 15.89% on WSJ corpus; Collaborated with a team of 4 to design ASR-TTS based voice conversion with speech redaction on CMU Arctic dataset.

University of Mumbai, India

- Das A., Karamchandani, S.H. et al. (2020). **Siamese Manhattan LSTM Implementation for Predicting Text Similarity and Grading of Student Test Papers**, Proceedings of International Conference on Wireless Communication, Lecture Notes on Data Engineering and Communications Technologies, volume 36: pp 593-602. Springer, Singapore.
- Das, A., Venkataramanan, V. (2020). **Study of Performance of an OFDM Transceiver Using SDR Platform.** Proceedings of International Conference on Wireless Communication. Lecture Notes on Data Engineering and Communications Technologies, vol 36: pp 363-372. Springer, Singapore.

PATENT

Carnegie Mellon University, Pittsburgh, PA

- Das A., Savvides M., et al. 2020. **System and method for identifying products in a shelf management system**. U.S. Patent Application Number 17/506,115. Filed October 20, 2021. (Patent Pending).

  Developed a deep neural network (EfficientNet) based discriminative classifier for n-way product classification for automated inventory monitoring in a commercial retail setting using a mobile robot with a camera sensor.