Last Updated : 8th July 2021

Prakhar Ganesh

Research Interests and Career Goals : I am primarily interested in the investigative study of learning models through explainability, interpretability, robustness, compression, vulnerability, etc., in an attempt to decode the reasoning behind complex architecture designs, and transcend the gap between theory and application. My long term goal is a career in research and academia in the field of AI.

CONTACT

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EDUCATION

National University of Singapore (NUS)
Master of Computing (AI specialisation)
Starting August 2021

Indian Institute of Technology (IIT) Delhi
BTech in Computer Science and Engr.
2015 - 2019 | Department GPA: 8.16/10
IIT-JEE All India Rank : 96 out of 1,17,231

WORK EXPERIENCE

Advanced Digital Sciences Center (ADSC)
Illinois at Singapore (UIUC)
Research Engineer | June '19 - July '21

WealthNet Advisors
New Delhi, India
Analyst (Intern) | May '18 - July '18

SKILLS

Reviewer

- Computer Speech and Language
- Signal, Image and Video Processing
- Winter Conference on Application of Computer Vision (WACV 2021)
- AAAI Conference on Artificial Intelligence (AAAI 2021)

Technical Blogs

From LeNet to EfficientNet | Pre-trained Language Models | Human Pose Estimation | Attention Mechanism in Deep Learning | Time Series Analysis | AutoDL | Knowledge Distillation | Model Compression | Growing RNN Cells | Automatic Lip Reading (ALR) | Twitter Information Network | Automatic Text Summarization | Object Detection

Languages & Libraries

Python, C/C++, Pytorch, Tensorflow, Keras, OCaml, Prolog, VHDL, OpenMP, Git

RESEARCH PAPERS

Published / Accepted

- P Ganesh, Y Chen, X Lou, M Khan, Y Yang, H Sajjad, P Nakov, D Chen, M Winslett, **"Compressing Large-Scale Transformer-Based Models : A Case Study on BERT"**, *TACL* [arxiv]
- P Ganesh, X Lou, Y Chen, R Tan, D Yau, D Chen, M Winslett, **"Learning-based Simultaneous Detection and Characterization of Time Delay Attack in Cyber-Physical Systems"**, *IEEE Transactions on Smart Grid*, 2020 [link]
- X Lou, C Tran, R Tan, D Yau, Z Kalbarczyk, A Banerjee, P Ganesh, **"Assessing and Mitigating Impact of Time Delay Attack: Case Studies for Power Grid Controls"**, *IEEE Journal on Selected Areas in Communications*, 2019 [link]

Preprint / Under Review

- P Ganesh, Y Chen, Y Yang, D Chen, M Winslett, **"YOLO-RED: Raw Feature Collection and Redistribution for Real-time Object Detection on Mobile GPUs"**, *ICCV*, 2021
- L Kong, P Ganesh, T Wang, J Liu, Y Chen, L Zhang, **"Free Lunch for Co-Saliency Detection: Context Adjustment"**, *ICCV*, 2021
- P Ganesh, G Gupta, S Saini, K Paul, **"Nucl2Vec : Local Alignment of DNA Sequences Using Distributed Vector Representation"**, *IEEE/ACM Transactions on Computational Biology and Bioinformatics* [biorxiv]

SELECTED MAJOR PROJECTS

Lightweight Object Detection on Edge Devices | Mar'20-Present | ADSC

- Designed a lightweight object detection model that can run real-time (>30 FPS) on Jetson Nano.
- Exploited multi-scale feature interaction to improve accuracy without hurting execution speed.
- Improved mAP by 2.55 points over the existing SOTA real-time object detection models.

Compressing Large-Scale Transformer-Based Models | Jan'20-Jun'20 | ADSC

- Performed in-depth analysis of transformer models like BERT to uncover possible redundancies.
- Wrote a systematic study comparing the effectiveness of various existing compression methods.

Protection against Time Delay Attacks | Jun'19-Jan'20 | ADSC

- Proposed a hierarchical LSTM with the ability of online processing to provide timely warnings.
- Improved upon existing postmortem data-driven approaches by providing quick approximate predictions and then gradually improve them with more data for accurate characterization.
- Achieved ∼68% decrease in error against the baselines with 1/3rd reaction latency.

Deep Learning in High Frequency Trading | May'18-July'18 | WealthNet Advisors

- Proposed a novel hybrid LSTM architecture, named VLSTM, capable of processing extremely long sequences by extracting 'multi-context' features in high-frequency trading setting.
- Achieved a tremendous boost of ∼4% increase in F-score against existing state-of-the-art.

Encoding Methods in Genomics | May'17-Dec'17 | IIT Delhi

- Developed a novel heuristic genome encoding method using distributed vector representation.
- About 3 times faster and more sensitive than BLAST, the official database search tool for NCBI.

SELECTED MINOR PROJECTS

- Restructuring Conversations for Zero-shot Abstractive Dialogue Summarization [arxiv]
- Very-Long Short Term Memory Networks (VLSTMs) in High Frequency Trading [arxiv]
- Automated Bio-Mechanical Analysis in Sports | Intern at Krida.ai [website]
- Literature Survey on Finding Influential Communities in Large Scale Networks [arxiv]
- Audio Tactile Reader for the Visually Challenged [code] [blog]