DIVYANSH JHUNJHUNWALA

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EDUCATION

Carnegie Mellon University, Pittsburgh, USA — *August 2020 - Present*
Ph.D. student, 2^{nd} year — **GPA: 3.95/4.0**
Department of Electrical and Computer Engineering
Advisor: Dr. Gauri Joshi

Indian Institute of Technology Kharagpur, India — *July 2016 - July 2020*
Bachelor of Technology(Honors) — **CGPA: 9.74/10**
Department of Electronics and Electrical Communication Engineering
Minor in Computer Science
Institute Silver Medal for highest CGPA in department

La Martiniere for Boys, Kolkata, India — *April 2001 - April 2016*
Indian School Certificate Examination(2016) — **98.5 %**
Secured 6^{th} highest aggregate marks in India

SELECTED AWARDS AND HONORS

- **David H. Barakat and LaVerne Owen-Barakat College of Engineering Dean's Fellowship** for pursuing doctoral studies at CMU for academic year 2021-2022.
- **Carnegie Institute of Technology Dean's Fellowship** for pursuing doctoral studies at CMU for academic year 2020-2021.
- **Swapan Kumar Saha Memorial Prize, IIT Kharagpur** for graduating with the highest CGPA among all B.Tech students in E&ECE department.
- **International Symposium (Microwave and Communication) 1981 Prize, IIT Kharagpur** for securing highest CGPA at the end of VI semester among all students in E&ECE department.
- **Goralal Syngal Scholarship, IIT Kharagpur** for being among the top 10 academic performers in the institute in the academic year 2018-2019.
- **Mitacs Globalink Scholarship** for pursuing a summer research internship at University of Waterloo, Canada 2019 (*declined*).
- **Govt. of India INSPIRE Scholarship** for being among top 1% performers in ISC examinations 2016.

PUBLICATIONS

1. **Adaptive Quantization of Model Updates for Communication-Efficient Federated Learning**
Divyansh Jhunjhunwala, Advait Gadhikar, Gauri Joshi, Yonina C. Eldar
International Conference on Acoustics, Speech, and Signal Processing (ICASSP) 2021 [**Paper**]
Proposed AdaQuantFL, an adaptive quantization strategy for compressing model updates from client to server to reduce communication cost as well as achieve low training error floor.
2. **Leveraging Spatial and Temporal Correlations in Sparsified Mean Estimation**
Divyansh Jhunjhunwala, Ankur Mallick, Advait Gadhikar, Swanand Kadhe, Gauri Joshi
Neural Information Processing Systems (NeurIPS) 2021 [**Paper**]
Designed novel estimators utilizing spatial and temporal correlation to improve mean estimation at server without additional compute or storage at nodes.

3. **FedVARP:Tackling the Variance Due to Partial Client Participation in Federated Learning**
   Divyansh Jhunjhunwala, Pranay Sharma, Aushim Nagarkatti, Gauri Joshi
   Uncertainty in Artificial Intelligence (UAI) 2022 [**Paper**]
   Proposed FedVARP, a novel variance reduction algorithm applied at the server to eliminate error due to partial client participation in federated learning.

TECHNICAL REPORTS

1. **Learning Fair Representations via Optimization in Latent Space**
   Divyansh Jhunjhunwala, Prabir Kumar Biswas
   Undergraduate project report 2020 [**Report**]
2. **Privacy Preserving Inference with Indirect Samples**
   Divyansh Jhunjhunwala, Gauri Joshi, Osman Yagan
   Summer internship report at CMU 2019 [**Report**]

INTERNSHIPS

IBM Research, Yorktown Heights *May 2022- August 2022*
Mentor: Dr. Shiqiang Wang

Investigating properties of overparameterized neural networks for combating heterogeneity and promoting few-shot learning in federated networks.

Research Intern at Carnegie Mellon University, ECE Department *May 2019-July 2019*
Mentors: Prof. Gauri Joshi and Prof. Osman Yagan

Developed an algorithm for learning population level statistics while maintaining privacy of individual user samples. Ran simulations comparing against Local Differentially Private algorithms which showed our proposed algorithm achieves better utility while having similar privacy guarantees.

National Digital Library of India *May 2018-July 2018*
Mentor: Prof. Partha Pratim Das

Researched and found novel ways of reducing size of a database by clustering strings based on their abbreviations using fuzzy string matching in Python. Created modules on extraction of metadata from publications using XML parsing and Grobid software. All code was reviewed and pushed to use.

SKILLS

Languages	C, C++, Python, MATLAB
ML Frameworks	OpenCV, TensorFlow, Keras, PyTorch

RELEVANT COURSES

CMU	Advanced Introduction to Machine Learning, Convex Optimization, Intermediate Statistics, Algorithms for Big Data, Probabilistic Graphical Models, Algorithms for Large-scale Distributed Machine Learning and Optimization, Advanced Machine Learning
IIT Kharagpur	Matrix Algebra, Probability and Stochastic Processes, Machine Learning, Deep Learning, Analog Communication, Digital Communication, Signals and Systems, Network Theory, Control Systems, Digital Image Processing, Information Theory and Coding Techniques, Adaptive Signal Processing, Artificial Intelligence, Network Optimization, Algorithms