DIVYANSH JHUNJHUNWALA

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EDUCATION

Carnegie Mellon University, Pittsburgh, USA *August 2020 - Present*
Ph.D. Candidate **GPA: 3.96/4.0**
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 all over India

RESEARCH INTERESTS

Distributed Optimization, Federated Learning, Machine Learning, Machine Unlearning

SELECTED AWARDS AND HONORS

- Selected as finalist for **Qualcomm Innovation Fellowship 2022** for research proposal on "*Incentivized Federated Learning for Data-Heterogeneous and Resource-Constrained Clients*".
- **David H. Barakat and LaVerne Owen-Barakat College of Engineering Dean's Fellowship** for pursuing doctoral studies at CMU for the academic year 2021-2022 and 2022-2023.
- **Carnegie Institute of Technology Dean's Fellowship** for pursuing doctoral studies at CMU for the 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.
- **Goralal Syngal Scholarship, IIT Kharagpur** for being among the top ten academic performers in the institute in the academic year 2018-2019.
- **Govt. of India INSPIRE Scholarship** for being one of the top 1% performers in the Indian School Certificate exams 2016.

PUBLICATIONS

1. **Towards a Theoretical and Practical Understanding of One-Shot Federated Learning with Fisher Information**
Divyansh Jhunjhunwala, Shiqiang Wang, Gauri Joshi
Under submission
*A preliminary version of the work appeared at FL@ICML workshop 2023 [**Link**]*
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2. **FedExP: Speeding up Federated Averaging via Extrapolation**
Divyansh Jhunjhunwala, Shiqiang Wang, Gauri Joshi
International Conference on Learning Representations (ICLR) 2023 [Paper]
Selected for spotlight presentation, top 25% of accepted papers.

3. **To Federate or Not To Federate: Incentivizing Client Participation in Federated Learning**
   Yae Jee Cho, **Divyansh Jhunjhunwala**, Tian Li, Virginia Smith, Gauri Joshi
   Under submission [**Preprint**]
   Selected for oral presentation at Neurips-22 Workshop on Federated Learning.

4. **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**]

5. **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**]

6. **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**]

INTERNSHIPS

IBM Research, Yorktown Heights *May 2023- August 2023*
Mentors: Dr. Praneet Adusumilli, Dr. Shiqiang Wang

Developed an RL based controller to optimize GPU resources while performing fine-tuning and inference at the edge. Also investigated machine unlearning algorithms to make ML models 'forget' specified data.

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

Investigated properties of overparameterized neural networks for combating heterogeneity, promoting few-shot learning and tuning server step size in federated learning.

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

Formulated and experimentally verified a novel algorithm for learning population-level statistics while maintaining privacy of individual user samples.

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, Foundations of Reinforcement Learning
IIT Kharagpur	Matrix Algebra, Probability and Stochastic Processes, Deep Learning Information Theory and Coding Techniques, Adaptive Signal Processing, Artificial Intelligence, Network Optimization, Algorithms

SKILLS

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

PROFESSIONAL SERVICES

- Reviewer for ICML 23, NeurIPS 22, IEEE Transactions on Signal Processing, IEEE Transactions on Networking.
- Teaching Assistant for Introduction to Machine Learning for Engineers (18-661) in Fall 22.