Achintya Kundu

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Current Position	Staff Research Scientist, IBM Research, Singapore

Research Expertise	Large Language Models, Deep Learning, Optimization, Machine Learning, Signal Processing

Work Experience

- **Staff Research Scientist** [December 2021 – till date]
  IBM Research, Singapore.
  Research Projects: Enhancing Training Efficiency of LLMs 📄 🌐
  Efficiently Distilling LLMs for Edge Applications 📄
  AI Model Optimization for Edge 📄

- **Research Scientist** [August 2021 – December 2021]
  IBM Research, Bangalore, India.
  Research Project: Robust and Personalized Federated Learning 📄

- **Senior Research Fellow** [March 2017 – July 2019]
  DST/INRIA (India-France) joint project "Bigfoks2: Learning from Big Data",
  Indian Institute of Science, Bangalore, India.
  Research Project: First order methods for Kernels and Submodular functions 📄

- **Software Design Engineer** [August 2008 – July 2009]
  Texas Instruments, Bangalore, India.
  Project: HD Video Compression on Smartphone

Education

- **Doctor of Philosophy**, 2022   **[CGPA: 7.5/8.0]**
  Department of Computer Science and Automation (CSA),
  Indian Institute of Science (IISc), Bangalore, India.
  Thesis: Novel First-order Algorithms for Non-smooth Optimization Problems in Machine Learning [Thesis Link]
  Research Supervisor: Prof. Chiranjib Bhattacharyya

- **Master of Engineering**, 2008   **[CGPA: 7.8/8.0]**
  Department of Electrical Communication Engineering (ECE),
  Indian Institute of Science (IISc), Bangalore, India.
  Project: Speech Enhancement - A Bayesian Estimation Approach using GMM

- **Bachelor of Engineering**, 2002   **[CGPA: 9.4/10]**
  Department of Electronics & Tele-communication Engineering (ETCE),
  Jadavpur University (JU), Kolkata, India.

AWARDS

- Received First Patent Application Achievement Award from IBM in 2023.

- Received the IBM IRL Distinguished Paper Award 2022.

- Won the **Best Paper Award** at IEEE EDGE 2022.

- Received Honorable Mention Award in Yahoo! Key Scientific Challenges, 2011.

- Won the Best Perspective Seminar Award 2010-11 in the Dept. of CSA, IISc.

RESEARCH PUBLICATIONS   [Google Scholar]

- **A. Kundu**, R. D. Lee, *et*.al., "Enhancing Training Efficiency Using Packing with Flash Attention", *arXiv:2407.09105*, 2024. 🗎 [Hugging Face Link]

- **A. Kundu**, F. Lim, *et*.al., "Efficiently Distilling LLMs for Edge Applications", *Conference of the North American Chapter of the Association for Computational Linguistics* (**NAACL**) , 2024, Vol. 6: Industry Track. 🗎

- **A. Kundu**, L. Wynter, *et*.al., "Transfer-Once-For-All: AI Model Optimization for Edge", *IEEE Intl. Conf. on Edge Computing and Communications* (**IEEE EDGE**), 2023. 🗎

- **A. Kundu**, P. Yu, *et*.al., "Robustness and Personalization in Federated Learning: A Unified Approach via Regularization", *IEEE Intl. Conf. on Edge Computing and Communications* (**IEEE EDGE**), 2022. 🗎 🏆 **Best Paper Award**

- **A. Kundu**, F. Bach, *et*.al., "Convex Optimization over Intersection of Simple Sets: improved Convergence Rate Guarantees via an Exact Penalty Approach", *Intl. Conf. on Artificial Intelligence and Statistics* (**AISTATS**), 2018. 🗎

- P. Pipada, **A. Kundu**, *et*.al., "LoadIQ: Learning to Identify Workload Phases from a Live Storage Trace", *USENIX Workshop on Hot Topics in Storage and File Systems* (**HotStorage**), 2012. 🗎

- **A. Kundu**, V. Tankasali, *et*.al., "Efficient algorithms for learning kernels from multiple similarity matrices with general convex loss functions", *Neural Information Processing Systems* (**NeurIPS**), 2010. 🗎

- **A. Kundu**, S. Chatterjee, *et*.al., "GMM Based Bayesian Approach to Speech Enhancement in Signal / Transform Domain", *Intl. Conf. on Acoustic, Speech, and Signal Processing* (**ICASSP**), 2008. 🗎

- **A. Kundu**, S. Chatterjee, *et*.al., "Speech Enhancement Using Intra-frame Dependency in DCT Domain", *European Signal Processing Conference* (**EU-SIPCO**), 2008. 🗎

- **A. Kundu**, S. Chatterjee, *et*.al., "Subspace Based Speech Enhancement Using Gaussian Mixture Model", **InterSpeech**, 2008. 🗎

Academic Achievements

- Received the **Gold Medal** for best Master of Engineering student (2007-08) in the Department of ECE, Indian Institute of Science, Bangalore, India.

- Received **Senate Commendation** at Indian Institute of Science, Bangalore for outstanding academic performance during Master of Engineering, 2006-08.

- Secured 6th rank (Electronics & Communication branch) in Graduate Aptitude Test in Engineering (GATE), 2006.

- Achieved 17th rank in West Bengal Joint Entrance Examination (an entrance test for undergraduate study in Engineering), 2002.

Research Internships

- IBM Research, Bangalore, February – May 2021
  Research Project: Robust Federated Learning

- INRIA, Paris, June – August 2018
  Research Project: Non-smooth Optimization with Linear Minimization Oracle

- INRIA, Paris, September – December 2017
  Research Project: Convex Optimization over Intersection of Simple Sets

- Xerox Research Centre, Bangalore, July – October 2015
  Research Project: Learning Robust Predictors under Uncertainty using Copulas

- Amazon (Machine Learning Team), Bangalore, May – July 2014
  Research Project: Nonlinear Feature Transformation for Large-scale Classification

- Yahoo! Labs, Bangalore, May 2010 – July 2010
  Research Project: Forecasting Unique User Counts (Reach) for Advertisements

Software Skills

- Deep Learning Framework: PyTorch

- Programming Language: Python, C, MATLAB

- Operating System: Linux