Otkrist Gupta
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ACADEMIC BACKGROUND

Ph.D., Massachusetts Institute of Technology, MIT Media Lab 2018

- Designing neural network architectures using reinforcement learning (ICLR 2017)
- Developed new machine learning algorithms for distributed training of neural networks without sharing of raw data (SplitNN/Federated Learning)
- Developed deep learning methods for classification of facial videos using auto-encoders, and determination of physiological signals such as heart rate using thermal imaging (CVPR 2016)
- Ph.D. Dissertation title: Unlocking the potential of neural networks in resource and data constrained environments.

M.Sc., Massachusetts Institute of Technology, MIT Media Lab 2012

- Gave the mathematical proof of existence and uniqueness of solution for around the corner 3D shape problem (Nature Communication, 2011)
- Developed an iterative fixed point algorithm for around the corner 3D imaging using time of arrival data of photons (Optics Express, 2012)
- Thesis: Recovering 3D shape Around a Corner using Ultra -Fast Time-of-Flight Imaging

B.Tech, Indian Institute of Technology Delhi, Comp. Science Rank #1, 9.6/10.0 (2009)

- Coursework (selected) – Data structures, Analysis and Design of Algorithms, Programming Languages, Artificial Intelligence
- Awarded **President's Gold Medal** for highest academic achievement in IIT among all graduating students

INDUSTRY EXPERIENCE

V.P. of Research and Development, Lendbuzz (Pre-IPO Unicorn) 2021 - Present

- Promoted to lead multiple teams, led scale up both operations and infrastructure
- Lead hiring of 16 engineers and team leads, on both research and development fronts
- Leading development of computer vision models for automated ID verification, bank statement parsing, MRZ extraction , image manipulation and fraud detection (IJDAR 2021, EURASIP 2022)

V.P. of Datascience, Lendbuzz June 2018 - June 2021

- Developed the financial risk scoring model, used for underwriting in sale of approx. billion dollar worth of car loans and 400 million dollar risk amortized securitization
- Hired and led a team of 6 people including 3 Ph.D.s to research, build and deliver 20+ ml models for various business use cases (and published research papers)
- Architect and lead developer of AutoML platform for hyperparameter optimization
- Developed the in-house MLOps platform for automated model optimization, tracking, reporting, deployment, testing and auditing
- Scaling up deployment of models using both RESTful apis and asynchronous queues

Software Engineer, Google May 2013 - August 2014

- Developed new speech infrastructure for Google Search NLP to improve the quality of voice responses

- Developed Google Now actions such as "What's on my Chromecast ?" featured in Google I/O 2014

Software Engineer, LinkedIn June 2012- May 2013

- Architect and owner of recruiter typeahead service to provide ultrafast searches over millions of member names
- Worked in a team to develop CheckIn app for sourcing millions of job applicants all over the country
- Built a notifications and alerts platform using Hadoop to store and retrieve information on a cluster

Software Developer, Tower Research Capital June 2009 - August 2010

- Developed servers (in C++) for trading and market data acquisition on LSE, NYSE Euronext and other exchanges
- Designed and developed UI (Django and MySQL) to administer trader risk limits and positions
- Developed a library of scripts to track positions, check database, send alerts, and debug server messages

SELECT PUBLICATIONS

Cited 3700 times, h-index **20**, i10-index **25**, see also my Google Scholar page.

26. Liu, Y., James, H., Gupta, O. and Raviv, D., 2022. MRZ code extraction from visa and passport documents using convolutional neural networks. International Journal on Document Analysis and Recognition (IJDAR).
25. James, H., Gupta, O. and Raviv, D., 2022. Learning Document Graphs with Attention for Image Manipulation Detection. In International Conference on Pattern Recognition and Artificial Intelligence.
24. Dubey, A., Gupta, O., Raskar, R. and Naik, N., 2018. Maximum-entropy fine grained classification. Advances in neural information processing systems (NeurIPS).
23. Dubey, A., Gupta, O., Guo, P., Raskar, R., Farrell, R. and Naik, N., 2018. Pairwise confusion for fine-grained visual classification. In Proceedings of the European conference on computer vision (ECCV).
22. Gupta, O. and Raskar, R., 2018. Distributed learning of deep neural network over multiple agents. Journal of Network and Computer Applications
21. Gupta, O., Raviv, D. and Raskar, R., 2018. Illumination invariants in deep video expression recognition. Pattern Recognition.
20. Gupta, O., Das, A.J., Hellerstein, J. and Raskar, R., 2018. Machine learning approaches for large scale classification of produce. Nature Scientific reports.
19. Dubey, A., Gupta, O., Raskar, R., Rahwan, I. and Naik, N., 2017, December. Regularizing Prediction Entropy Enhances Deep Learning with Limited Data. In Proceedings of the Neural Information Processing Systems (NeurIPS).
18. Baker, B., Gupta, O., Naik, N. and Raskar, R., 2016. Designing neural network architectures using reinforcement learning. International conference on learning representations (ICLR).
17. Velten, A., Willwacher, T., Gupta, O., Veeraraghavan, A., Bawendi, M.G. and Raskar, R., 2012. Recovering three-dimensional shape around a corner using ultrafast time-of-flight imaging. Nature communication.
16. Gupta, O., Willwacher, T., Velten, A., Veeraraghavan, A. and Raskar, R., 2012. Reconstruction of hidden 3D shapes using diffuse reflections. Optics express.

PUBLICATIONS CONTD.

15. James, H., Gupta, O. and Raviv, D., 2022. Printing and scanning investigation for image counter forensics. EURASIP Journal on Image and Video Processing.
14. Vepakomma, P., Singh, A., Zhang, E., Gupta, O. and Raskar, R., 2021, December. NoPeek-Infer: Preventing face reconstruction attacks in distributed inference after on-premise training. IEEE International Conference on Automatic Face and Gesture Recognition (FG).
13. James, H., Gupta, O. and Raviv, D., 2020. Printing and Scanning Attack for Image Counter Forensics. arXiv preprint arXiv:2005.02160.
12. Gupta, O. and Raskar, R., Massachusetts Institute of Technology, 2020. Secure training of multi-party deep neural network. U.S. Patent 10,755,172.
11. Ilanchezian, I., Vepakomma, P., Singh, A., Gupta, O., Prasanna, G.N. and Raskar, R., 2019. Maximal adversarial perturbations for obfuscation: Hiding certain attributes while preserving rest. arXiv preprint arXiv:1909.12734.
10. Singh, A., Vepakomma, P., Gupta, O. and Raskar, R., 2019. Detailed comparison of communication efficiency of split learning and federated learning. arXiv preprint arXiv:1909.09145.
9. Vepakomma, P., Gupta, O., Dubey, A. and Raskar, R., 2019. Reducing leakage in distributed deep learning for sensitive health data. arXiv preprint arXiv:1812.00564.
8. Vepakomma, P., Gupta, O., Swedish, T. and Raskar, R., 2018. Split learning for health: Distributed deep learning without sharing raw patient data. arXiv preprint arXiv:1812.00564.
7. Vepakomma, P., Swedish, T., Raskar, R., Gupta, O. and Dubey, A., 2018. No peek: A survey of private distributed deep learning. arXiv preprint arXiv:1812.03288.
6. Baker, B., Gupta, O., Raskar, R. and Naik, N., 2017. Accelerating neural architecture search using performance prediction. International conference on learning representations (ICLR).
5. Satat, G., Tancik, M., Gupta, O., Heshmat, B. and Raskar, R., 2017. Object classification through scattering media with deep learning on time resolved measurement. Optics express.
4. Rana, A., Yauney, G., Wong, L.C., Gupta, O., Muftu, A. and Shah, P., 2017, November. Automated segmentation of gingival diseases from oral images. In 2017 IEEE Healthcare Innovations and Point of Care Technologies (HI-POCT).
3. Gupta, O., Raviv, D. and Raskar, R., 2017. Multi-velocity neural networks for facial expression recognition in videos. IEEE Transactions on Affective Computing (TAC).
2. Gupta, O., McDuff, D. and Raskar, R., 2016. Real-time physiological measurement and visualization using a synchronized multi-camera system. In Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition Workshops.
1. Gupta, O., Raviv, D. and Raskar, R., 2016. Deep video gesture recognition using illumination invariants. arXiv preprint arXiv:1603.06531.

SPECIAL ACHIEVEMENTS

- Semi-Finalist in MIT 100K (founding member Convexic – job matching for companies and users)
- Awarded Rajiv Bambawale, B.N. Bhardawaj, Raman Subramaniam awards for academic excellence in IIT
- Secured percentile of 99.4 in CAT out of 2,50,000, and accepted into IIM Ahmedabad and Bangalore (2009)