Govind Mittal

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EDUCATION

New York University (NYU)   *Sep 2019 - May 2025*
Doctor of Philosophy (Ph.D.) Candidate in COMPUTER SCIENCE, All but dissertation   GPA : 3.8 / 4.0
Dissertation: Verifying the Virtual: Authentication Frameworks for Digital Media Streams
Advisors: Prof. Nasir Memon and Prof. Chinmay Hegde

Birla Institute of Technology and Science (BITS) Pilani, India   *Aug 2014 - Jul 2019*
Dual Major: *Master of Science (Honours) in* MATHEMATICS   *GPA: 8.0/10.0*
             Bachelor of Engineering (Honours) in COMPUTER SCIENCE

ACADEMIC PUBLICATIONS

🗄 - Created New Dataset; * - Equal Contribution ; Ⓒ - Provisionally Patented

1. WavePulse: Real-time Content Analytics of Radio Livestreams 🗄 Ⓒ
   G Mittal, S Gupta, S Wagle, C Chopra, AJ DeMattee, N Memon, M Ahamad, C Hegde
   WWW 2025 (ACM The Web Conference)

2. PITCH: AI-assisted Tagging of Deepfake Audio Calls using Challenge-Response 🗄
   G Mittal, A Jakobbson, KO Marshall, C Hegde, N Memon
   AsiaCCS 2025 (ACM Asia Conference on Computer and Communications Security)

3. GOTCHA: Real-Time Video Deepfake Detection via Challenge-Response 🗄 Ⓒ
   G Mittal, C Hegde, N Memon
   EuroS&P 2024 (IEEE European Symposium on Security and Privacy)

4. FiFTy: Large-Scale File Fragment Type Identification Using Convolutional Neural Networks 🗄
   G Mittal, P Korus, N Memon
   TIFS 2020 (IEEE Transactions on Information Forensics and Security Vol. 16)

5. Identity-preserving aging of face images via Latent Diffusion Models
   S Banerjee*, **G Mittal***, A Joshi, C Hegde, N Memon
   IJCB 2023 (IEEE International Joint Conference on Biometrics, **Best Reviewed Paper**)
   TBIOM 2024 (IEEE Transactions on Biometrics, Behavior, and Identity Science, **Special Invite to Journal**)

6. SELECT: A Large-Scale Benchmark of Data Curation Strategies for Image Recognition 🗄
   B Feuer, J Xu, N Cohen, P Yubeaton, **G Mittal**, C Hegde
   NeurIPS DB 2024 (Neural Information Processing Systems: Datasets and Benchmarks)

7. Circumventing Concept-Erasure Methods for Text-to-Image Generative models
   M Pham, KO Marshall, N Cohen, **G Mittal**, C Hegde.
   ICLR 2024 (International Conference on Learning Representations)
   NeurIPS 2023 Workshop on Diffusion Models.

8. Spoken Language Identification Using ConvNets
   Sarthak, S Shukla, **G Mittal**.
   AmI 2019 (European Conference on Ambient Intelligence, **Most Cited Paper across Proceedings**)

WORK EXPERIENCE

Research Intern   Jun - Aug 2020
Vidrovr   *New York, NY*

· Company extracted insights from only visual part of daily news videos and lacked capability to process the audio part
· Built company's first end-to-end natural language processing pipeline for extracting events from transcripts

Graduate Research Assistant   Sep 2019 - Dec 2024
NYU Tandon School of Engineering   *New York, NY*

· Managed a team of 6 to drive an innovative and ambitious research agenda to completion

· Mentored and drove three undergraduate / graduate researchers' interns on ML and efficient usage of AI Infrastructures
· Communicated findings to technically diverse audiences
· Scoped, Adapted and Improvised team performance and research outcomes

SELECTED PROJECTS

WavePulse: Real-time Content Analytics of Radio Livestreams   Spring 2024 - Fall 2024
ML System Design • Team Management • ETL • Automated Data Collection • Semantic Search
· Pioneered WavePulse: a framework for nationwide radio analytics with real-time transcription
· Led 6-person team and fast-tracked development and deployment of system under tight resource constraints
· Created fault-tolerant LLM-based processes to handle 18 TB of audio from 400+ live streams.
· Analyzed content to discover radio communities, infer sentiment and spatially and temporally track narratives.

AI-assisted Deepfake Detection in Real-time Video and Audio Calls   Spring 2022 - Fall 2023
Human Studies • Data Collection • Supervized Learning • Synthetic Video and Data
· Invented GOTCHA and PITCH, CAPTCHA-like verification systems to guard against deepfake scams on audio/video calls.
· Boosted deepfake detection to 88% (human) and 82% (AI) AUC against four SoTA pipelines (58% baseline)
· Parsed and understood a massive codebase and all moving parts to improve it to work for me.
· Generated 56,000 deepfake videos and 1.6 million speech samples for comprehensive dataset
· Trained 20 Wav2Vec-based detectors achieving 85% accuracy on challenging deepfake subset

Bayesian Learning for Uncertainty Estimation in Forensic Analysis   Fall 2020 - Spring 2021
Hyperparameter Optimization • ML Software Development
· Developed a modular framework to integrate uncertainty quantification into neural networks for forensic applications
· Optimized ML pipelines, achieving 6x speedup through by prefetching data, parallelizing extraction, transformation, caching and converting code bottlenecks into JIT compiled blocks.

TECHNICAL SKILLS

ML Concepts:	Human Data Collection • Large Language Models • Transformers • Computer Vision • Speech Processing • Classification • Hyper-parameter Optimization • Anomaly Detection
ML Paradigms:	Supervised Learning • Unsupervised Learning • Semi-supervised Learning • Bayesian Machine Learning • Transfer Learning • RAG
Pythonic Frameworks:	PyTorch • TensorFlow • NumPy • Pandas • Matplotlib • Jupyter
Cyber Security Concepts:	Threat Modeling • Authentication • Indicators of Compromise • Reverse Engineering • Forensics • Capture-the-Flag • Human and User Studies
Miscellaneous:	Linux • Git • Shell Scripting • Slurm • HPC • PyCharm IDE • Ethics Compliance

AWARDS, FELLOWSHIPS AND MENTIONS

Featured in WIRED: Real-Time Video Deepfake Scams Are Here. This Tool Attempts to Zap Them

Funded by Google's Cyber NYC Program in 2023 - 2024 with $100,000.

Recipient of **Dean's Ph.D. Fellowship** at NYU Tandon School of Engineering in 2019 - 2020.

Awarded **Young Scientist Fellowship (KVPY)** of Indian Institute of Science (IISc), and funded by the Department of Science and Technology, Government of India, from 2014 to 2019 (Scored **above 99.8 percentile across applicants**.)

VOLUNTEER AND SERVICE

Expert Contributor at Thomson Reuters Fact-Checks
Technical Reviewer: Evaluated research for top ML venues including **ICLR**, **WWW**, and **IEEE Security**
Co-organized Applied Research Competition, Cyber Security Awareness Week (CSAW 2021) at NYU Tandon

REFERENCES

Upto three professional references available upon request.