# Yash Gupta

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## Education

### Massachusetts Institute of Technology (MIT), Cambridge, MA — *2024 –2026*

Master of Finance (MFin) GPA: **5.0** / 5.0
Concentration in **Financial Engineering**
*Anticipated Coursework:* Advanced Mathematical Methods, Advanced ML, Financial Data Science, NLP, Optimization, Financial Engineering, Financial Markets, Deep Learning.

### Birla Institute of Technology and Science (BITS), Pilani, India — *2019 – 2023*

Bachelor of Engineering (BE) in **Computer Science**
**University Rank: 3** GPA: **9.87** / 10.0
Minor in **Data Science** GPA: 10.0 / 10.0
*Coursework:* ML, Data Mining, OOP, Applied Statistics, Probability, Algorithms, Differential Equations, Derivatives & Risk, Economics, Multivariable Calculus, Linear Algebra.

## Publications

[1] **Y. Gupta**, N. Goyal, V.J. Varghese, P. Goyal, "Utilizing MODIS Fire Mask for Predicting Forest Fires Using Landsat-9/8 and Meteorological Data," *ACM/IEEE **DSAA***, Thessaloniki, Greece, 2023. (Ranked A in CORE) [link]

[2] **Y. Gupta**, A. Ramaswamy, A. Tripathy, R.S. Mittal, R. Sitaniya, "Merchant Extraction from Bank Transactions Using NER with Contextual Embeddings for Out-of-Vocabulary Tokens," *IEEE **ICDM***, Abu Dhabi, UAE. (Ranked A* in CORE) *[In Preparation]* [link]

[3] K. Agarwal, P. Poli, **Y. Gupta**, G. Juneja, A. Bopaiah, A. Arani, "IoT Attack Detection and Prevention through Machine Learning Systems," *IEEE ICCSAI,* Greater Noida, India, 2023. [link]

[4] S.K. Das, S. Anwar, U. Tulsyan, **Y. Gupta**, R. Vudutta, "Role of AI in Financial Markets: Impacts on Trading, Portfolio Management, and Price Prediction," *Journal of Electrical Systems,* Vol 20, No 6s, 2024. [link]

## Certifications, Skills, & Test Scores

Certifications: **CFA Level 1** *(Top 10 percentile)* | UC Berkeley MFE Preprogram (*Accepted to MFE*) | Deep Learning Specialization *(Andrew Ng)*

Programming: *Proficient:* Python | C | JAVA | AWK | SQL *Familiar:* Bash | C++ | Haskell | MATLAB | R

ML/DS: TensorFlow | Keras | Pandas | Scikit-learn | Gensim | PySpark | NumPy | RASA | OpenCV

Software Tools: Excel | Overleaf | Git/GitLab/GitHub

Test Scores: ISC'19- 99.4% (National/All India Rank 3 out of 240K students) | GRE- 337/340 + 6/6 | SAT2-2400 | SAT- 1560 | JEE- 99.9$^{th}$ %ile | NTSE- Rank 10

## Leadership Roles

**Academic Counseling Cell, BITS Pilani**
Served as the academic counselor (AY 2021-22), mentoring freshmen and struggling peers, and hosted academic panels.

**Student Faculty Council, BITS Pilani**
Represented CS class as of 140+ as the senator (Fall 2021) to plan effective teaching/evaluation during the pandemic.

**Microsoft Learn Student Ambassador (MLSA)**
Co-led a team of 8 peers and underclassmen to host an AI gaming event during university techfest APOGEE'21.

## Extracurriculars and Volunteering

MIT: Quantitative Finance Club, AI & ML Club, Investment Management Club, Adam Smith Society
BITS Pilani: Coding Club, Engineers without Borders

## Work Experience

### WorldQuant LLC, Millennium Management — *Old Greenwich, CT*

Quantitative Research Consultant (Part-time) — *Feb 2024 – Present*

- Conceptualized, implemented, and backtested **25+ trading signals** (alphas) using fundamental, sentiment, and price volume data for US/China equity markets.
- Ranked in the top 2% (Gold level) in the WorldQuant BRAIN Challenge.

### Goldman Sachs — *Bengaluru, India*

Quantitative Strategist – Analyst — *Jul – Nov 2023*

- Identified earnings at risk (EaR) of **over USD 40M** by simulating impact of **yield curve shocks** on net interest income on firm's rec/pay using Slang and SecDB.
- Automated population of security types and currencies in Treasury P&L database with Slang, Python, and Pandas.

Quantitative Strategist – Intern — *Jun - Aug 2022*

- Constructed and trained a **CatBoost** model using PySpark, Hadoop, and Scikit-learn for **predicting settlement of (T+1)-trades** to manage **intraday liquidity risk** (ILR), achieving a mean F1-score of **0.95.**
- Integrated the model with Kafka queues for incoming trades and added a **Shapley analysis** module for explaining ML blackbox predictions in real-time.

### American Express – AI Labs — *Gurugram, India*

AI Researcher – Intern — *Jan - Jun 2023*

- Built a pipeline for merchant extraction from client transactions with a **BiLSTM-Attention-CRF** based **named entity recognition** (NER) model using Gensim and TensorFlow with an **85.17%** extraction match rate for **bank-based underwriting**.
- Augmented the pipeline with a **BERT-based masked word prediction** model to generate **contextual embeddings**, driving accuracy up by **30.7%** for OOV tokens.

### NMT Technologies Pvt. Ltd. — *Noida, India*

Software Engineering Intern — *May - Jul, 2021*

- Built a **lab test checker** tool to analyze results of over **920 medical diagnostic tests** and suggest likely pathologies using Python, BASH, and MAWK.
- Created a **frontend** in JavaScript for deployment on a medical consulting website and added support for **search autocomplete** using jQuery.

### Mosaic Pvt. Ltd. — *Noida, India*

Web Development Intern — *Dec 2020 – Feb 2021*

- Wireframed UI frontend design with clients and implemented their requests in HTML, CSS, and JavaScript.
- Designed and improved **UI/UX** with special emphasis on **page latency**, bringing down the largest contentful paint (LCP) by **34%**.

## Research Experience

### BITS Pilani – ADAPT Lab — *Pilani, India*

Undergraduate Researcher — *Jan 2022 – Jun 2023*

- Extracted and fused **multispectral satellite images** from MODIS/Landsat-9/8, using Python, OpenCV, and Google EarthEngine into a **multivariate time series**.
- Built and trained a **BiLSTM-Attention** model using **contrastive learning** to predict fires on a 30 m granularity with an AUC of **0.98**.

### Harvard University – Visual Computing Group — *Cambridge, United States*

ML Research Intern — *Jan - Mar, 2022*

- Implemented a C++/Python pipeline for **reconstruction of 3D scenes** from mobile captured images/videos using **neural radiance fields** (NERF) and built camera transformation matrices for **rendering novel views** of synthetic/real-word scenes.
- Reduced the trained time from **more than 24 hours to under 5 minutes** leveraging multiresolution hash encoding and GPU-level optimizations.

### Indian Space Research Organization (ISRO) – IIRS — *Dehradun, India*

Research Intern – Scientific Computing — *May - Jul, 2021*

- Developed a **numerical simulation model** to estimate the **backscattering coefficient** for active remote sensing under the Michigan Microwave Canopy Scattering (**MIMICS**) paradigm in FORTRAN/Python for crop harvest prediction.
- Applied **U-Nets** and **ResNets** for identification of water bodies through microwave **satellite image segmentation**.