ARYAN GUPTA

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SKILLS

Languages: Python (Proficient); C/C++, JavaScript (Familiar)

AI/ML Frameworks: PyTorch, scikit-learn, Keras, NumPy, Pandas, Matplotlib, Pygame, Pymunk

Cloud & Tools: IBM Cloud, Weights & Biases, Git, Flask, MySQL, Unix/Linux

Other: Networking, Automation, Privacy & Security, Problem-Solving

AI/ML Domains: Reinforcement Learning (PPO, MADDPG, Multi-Agent Self-Play), Computer Vision (Stable Diffusion, ControlNet), Time-Series Forecasting (ARIMA), Supervised Learning (Random Forest), CUDA / GPU-Accelerated Training

EXPERIENCE

AI and Security Research Intern — *Ministry of Electronics and Information Technology (MeitY)* *June 2025 – July 2025*

- Utilized Stable Diffusion and ControlNet (computer vision) to generate aesthetic, full-image blended error-correction QR codes, enabling cybersecurity applications like steganography, covert data transmission, and anti-phishing authentication.
- Researched and integrated dual-value QR codes with distance-based, cryptographically signed payloads, supporting tiered access control, multi-factor authentication, anti-counterfeiting, and defensive threat modeling.

AI and Cloud Intern — *Edunet Foundation, in collaboration with IBM* *July 2024 – Aug 2024*

- Cleaned and preprocessed large datasets — addressing missing values and inconsistencies to ensure data quality and integrity — then developed a robust ARIMA-based time-series forecasting model to drive predictive insights.
- Deployed the model on the IBM Cloud platform, leveraging cloud-based infrastructure to enable scalable, efficient model deployment and gaining hands-on experience with cloud technologies.

PROJECTS

MARL Tag — Multi-Agent Reinforcement Learning Pursuit-Evasion Game *Jan 2026 – April 2026*

- Built a self-play multi-agent reinforcement learning system (3v3 pursuit-evasion) in PyTorch, implementing PPO with GAE and parallelizing training across 8 subprocess environments (30M timesteps) with CUDA GPU acceleration.
- Designed a 102-dimensional raycast-based perception system and custom Pymunk physics/reward engine, achieving a 95% seeker win rate across a 100-episode evaluation benchmark.

Multi-Agent Vehicle Fleet Optimization System *Jan 2025 – April 2025*

- Developed a multi-agent taxi simulation system using Python, PyGame, and PyTorch that implements both A* path-finding and MADDPG reinforcement learning approaches. Reduced passenger wait times by 20% and optimized fleet coordination, improving ride efficiency for 100+ simulated passengers.

Student Performance Prediction *June 2024 – July 2024*

- Built a Random Forest Classifier to predict student performance with 96% accuracy. Led end-to-end data preprocessing (imputation, encoding) and parameter optimization using GridSearchCV, boosting model accuracy by 10% and enabling actionable educational interventions.

Automated Video Generation Project *June 2021 – July 2021*

- Automated end-to-end video creation from Reddit data using Python, API integration, and MoviePy. Reduced video production time by 90% and increased YouTube engagement by 20% through workflow optimization.

EDUCATION

Manipal University Jaipur — *B.Tech, Information Technology* *Aug 2022 – May 2026*

Relevant Coursework: Data Structures & Algorithms, Object-Oriented Programming, Operating Systems, Relational Database Management Systems (RDBMS), Data Communication, Computer System Architecture, Web Technologies

The Air Force School, Subroto Park — *Science Stream* *Mar 2019 – Feb 2022*

LEADERSHIP & EXTRA-CURRICULAR ACTIVITIES

- **ACM MUJ Student Chapter — Head of Projects and Research Team:** Spearheaded an innovative project team of 15+ students, built by interviewing 40+ applicants, and mentored them to a 90% project completion rate.
- **CyberSpace College Club — Research Team:** Actively contributed to cybersecurity research initiatives, collaborated on technical projects, and gained practical experience with emerging security technologies and tools.
- **Hackathons:** Directed my hackathon teams, leading project development, coordination, and successful presentations to expert judging panels. Fostered collaboration and innovation under high-pressure competitive environments.