Yash Agarwal

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Academic Details

Graphic Era Hill University — Dehradun, Uttarakhand
Bachelor of Technology in Computer Science & Engineering — *Aug 2023 – Present*

St. Mary's School — Kashipur, Uttarakhand
Intermediate, CBSE — *2023*

St. Mary's School — Kashipur, Uttarakhand
High School, CBSE — *2021*

Projects

Interactive Resume Maker | *Spring Boot, React, Three.js, MongoDB* — Feb 2025 – May 2025
Supervisor: *Prof. (Dr.) Prateek Shrivastava*

- Developed an immersive application to visualise user resumes in a 3D forest environment using Three.js.
- Created a secure backend using Spring Boot and Java 17, implementing JSON Web Tokens (JWT) & BCrypt for authentication.
- Engineered RESTful APIs to manage user sessions and fetch resume data from MongoDB, enabling efficient data retrieval.

YouTube Language Drift | *Python, NLTK, Scikit-Learn, YouTube API* — Jan 2026 – Present
Supervisor: *Prof. (Dr.) Susheela Dhaiya*

- Engineered a Natural Language Processing (NLP) pipeline to analyse linguistic evolution over the years, sampling 50 videos/year/creator to normalise bias across transcripts.
- Measured vocabulary shifts by calculating the Type-Token Ratio for lexical analysis and measuring year-over-year deviations.
- Analysed linguistic patterns using N-gram extraction and Jaccard similarity indices to identify trends using Matplotlib visualisation.
- Designed a reproducible workflow with structured configurations and randomised selection to ensure consistent experimental results across multiple execution runs.

Final Year Project Management Portal | *Next.js, Firebase, Tailwind CSS v4* — Aug 2025 – Feb 2026
Supervisor: *Dr. Amit Gupta*

- Built a project management system using Next.js and Tailwind CSS for streamlining the workflow of students, faculty, external evaluators, and admin.
- Designed a Role-Based Access Control system using Firebase Authentication, implementing read/write permissions using Firestore rules.
- Implemented real-time data synchronisation using Firestore Listeners for instant updates for project submissions and faculty reviews.
- Structured a NoSQL (Firestore) database for complex relationships between users, teams, panellists, and external evaluators.

Smart Plant Watering System | *C++, Next.js, Firebase, IoT* — June 2025 – Aug 2025
Supervisor: *Dr. Vikrant Sharma*

- Developed an automated IoT system using ESP8266 to monitor and control soil moisture in real time.
- Built a web app using Next.js and Tailwind CSS for real-time data visualisation and remote control of the system.
- Created a secure architecture using MAC-based device identification, where hardware synchronises state changes directly from Firestore to eliminate vulnerable inbound HTTP endpoints.
- Implemented a captive portal for dynamic WiFi connection, enabling seamless device setup without the need for hardcoded credentials.

Technical Skills

Languages: Java, C++, Python, JavaScript (ES6+), SQL, HTML/CSS
Frameworks/Libraries: Spring Boot, React.js, Next.js, Three.js, Tailwind CSS v4, Flask, NLTK, Scikit-Learn
Databases: MongoDB, Firebase (Firestore, Realtime DB), MySQL
Tools: Git, Docker, Postman, Linux/Bash, Vercel, Arduino IDE