

# Mohammad Ammar Mughees

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## EDUCATION

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**MSc Geoinformatics Engineering (Class LM-32, Computer Engineering)** **2023 - 2026 (expected)**

Politecnico di Milano

*Relevant coursework:* Computer Architecture & Operating Systems, Computing Infrastructures, Machine Learning, Artificial Neural Networks & Deep Learning, Software Engineering, Mobile Application Development.

*Selected grades:* 30L/30 Geoinformatics Project · 30/30 Positioning · 29/30 Geospatial Processing.

**Bachelor of Technology (B. Tech.), Civil Engineering** **2023**

Aligarh Muslim University (AMU)

GPA: 8.7/10

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## PROJECTS

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### Independent Projects

1. **[TrenLens](#) Self-initiated Full-Stack AI Content Platform** **Mar 2026 - Present**

- **Serverless media platform on Cloudflare Workers (D1, R2, KV, Workers AI):** TypeScript monorepo with 5 packages, 26 DB tables, 60+ REST endpoints, and 4-role RBAC (reader → creator → editor → admin).
- **AI assistant with 100+ MCP tools:** BYOC LLM (Claude / OpenAI / Ollama), SSE streaming, persistent agents; lets privileged users control the entire platform via conversation.
- **On-edge AI features:** auto-tagging, comment moderation, excerpt generation (Llama 3.1), image & avatar generation (SD XL, DALL-E 3); drag-drop Bento homepage layout builder with Puck WYSIWYG editor.
- **Stack:** TypeScript (strict), React 19, Hono, Drizzle ORM, Zod, TanStack Query, Tiptap, Tailwind CSS 4, Vite 6, Vitest (40+ tests).

2. **[Portfolio Website](#) Self-built Nuxt.js app** **Apr 2025 - Present**

- Developed a dynamic portfolio website with custom admin dashboard using Nuxt.js and Vue.js.
- Integrated Supabase for authentication and database management with real-time content updates.
- Implemented responsive design with Tailwind CSS and GDPR-compliant analytics.

### Academic Projects

3. **[PlanetScope-py](#) Python library for satellite imagery analysis** **May 2025 - Jul 2025**

- MSc Geoinformatics Project, 30L/30 · [GitHub](#) · [PyPI](#) · [Docs](#)
- **Co-developed a production-grade Python library for the Planet Labs API:** 21 modules, ~16,400 LOC across 4 major releases. Published to PyPI with a 496-test suite (offline mock server, all passing).
- **Multi-algorithm spatial density engine** with automatic method selection (rasterization, vector overlay, adaptive hierarchical grid); async asset pipeline using aiohttp with circuit-breaker rate limiting and a vectorized FAST temporal analysis path delivering 10–50× speedup.
- **Stack:** Python 3.10+, NumPy, GeoPandas, Rasterio, Shapely, pyproj, aiohttp, pytest. Outputs: GeoTIFF, OGC GeoPackage, Folium interactive maps.

4. **[Mobile Application](#) Development (Flutter & Firebase)** **Sep 2024 - Feb 2025**

- *Design & Implementation of Mobile Applications coursework.* Cross-platform Flutter app with **Firebase** backend for real-time grocery and storage management.

5. **[AUPE RiskMonitor](#) Landslide Risk Analysis Software** **Feb 2024 - Jul 2024**

- *Software Development for Geoinformatics coursework.* Python risk analysis pipeline for **landslide monitoring**, backed by **AWS PostgreSQL + PostGIS** for spatial queries.
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## PUBLICATIONS

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- Mughees, M.A. et al. Stability Analysis of Slope with Transmission Tower. AIP Conference Proceedings 3010, 030013 (Jan 2024). <https://doi.org/10.1063/5.0193872>

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## ***SKILLS***

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- **Languages (Primary):** Python
- **Languages (Working):** TypeScript, Dart, SQL
- **Frameworks & Platforms:** React, Vue.js, Nuxt.js, Flutter, Hono, Node.js, Tailwind CSS
- **Cloud & Backend:** Cloudflare Workers (D1, R2, KV, Workers AI), AWS, Firebase, Supabase
- **Data & Geospatial:** NumPy, Pandas, GeoPandas, Rasterio, Shapely, pyproj, TensorFlow, PostgreSQL/PostGIS
- **Tooling:** Git, Vite, Vitest, pytest, Drizzle ORM, Zod, QGIS, ArcGIS
- **Languages (Spoken):** English (Fluent, C1), Hindi (Native), Italian (Learning, 140-hour Regione Lombardia intensive course in progress)

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## ***ACHIEVEMENTS***

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- **All India Rank 96**, National Engineering Olympiad 5.0
- **Buddy Project Mentor**, Politecnico di Milano (Aug 2024 - Jan 2025). Mentored two international students and earned Open Badge certification.
- **Startup Bootcamp graduate**, Politecnico di Milano (Apr 2025). 5-module entrepreneurship program