Krish Goel

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EDUCATION

Manipal University Jaipur, Rajasthan, India — September 2022 – April 2025 (Expected)
Bachelor of Technology (Honours) in Computer Science Engineering with AI & ML — **GPA:** 9.02/10 [Dean's List]

- **Relevant Coursework:** OOP, DSA, RDBMS, Computer Architecture, Operating Systems, Multivariate Calculus, Linear Algebra, Probability & Statistics, Discrete Mathematics, Automata Theory, Computer Networks, Soft Computing, NLP, Computer Vision

Manipal Institute of Technology, Karnataka, India — September 2021 – August 2022 *(Transferred)*
Bachelor of Technology - First Year, Common Stream Engineering

Sanskriti School, Chanakyapuri, New Delhi, India — April 2017 – May 2021
High School (CBSE Curriculum – English, Physics, Chemistry, and Mathematics) — **Grade:** 95.6%

- **Relevant Coursework and Activities:** Physics, Chemistry, Calculus - 1, 2, 3, Vice President and Head of AI & IoT in the Tech and Entrepreneurship Club, Director of TechOps at Sanskriti Model UN, Member of the Student Council

RESEARCH, WORK & LEADERSHIP EXPERIENCE

Randomize(); The Official CSE Club at Manipal University Jaipur — May 2023 – April 2024
President, 250+ Member Team
Revitalized the club by focusing on core technologies. Introduced 3 AI-driven robotics projects: Odysseus (autonomous maze-solver), Pathaan (EEG-controlled quadruped with a turret), and Quill (handwriting recreation and assignment writing), alongside 7 minor projects. Organized 8+ hands-on workshops with a total attendance exceeding 2500.

Epson Robotics, Bangalore, India — December 2023 – January 2024
Robotics Intern
Got introduced to Epson's industrial robots lineup - 6-Axis Arms and SCARA. Contributed to the integration of computer vision in SCARA's Feeder System, advancing automation capabilities.

Indian Council of Medical Research (ICMR), New Delhi, India — May 2023 – August 2023
Research Intern, Research manuscript under review Preprint with The Lancet (SSRN 4789897)
Led the development of a Clinical Trial Registry (CTR) while adhering to WHO-issued "International Standards for Clinical Trial Registries," under the guidance of Dr. Harpreet Singh. Distributed to over 70 countries as part of G-20 Summit, Delhi 2023 deliverables.

Indian Institute of Science (IISc), Bangalore, India — August 2023
Research Intern, Contribution Accepted
Contributed to data structuring for medical imaging datasets, enhancing data formats and accuracy at MIDAS - an ongoing ML-based Research Project at IISc aimed at creating a centralized platform for "gold standard" medical data for better research and diagnostics.

RESEARCH PUBLICATIONS

Krish Goel and Mahek Chandak **"HIRO: Hierarchical Information Retrieval Optimization,"** *arXiv preprint arXiv:2406.09979* (arxiv.org/abs/2406.09979) — June 2024

Goel, Krish, Shweta Rana, Dr Prabudh Goel, and Harpreet Singh. **"Design and Development of an Open-Source Clinical Trial Registry (CTR) Template Aligned with Who International Standards."** *Available at SSRN 4789897.* — December 2023
Under Review, Preprints with The Lancet (SSRN 4789897)

TECHNICAL SKILLS

Programming: Python 3 (8 Years), JavaScript and TypeScript (6 Years), C (3 Years), Data Structures and Algorithms

AI & Machine Learning: Text-Transformers, Attention Mechanisms, Dense Networks, RNNs, LSTMs, CNNs, GANs, LLMs (Mistral, Meta Llama, Claude, OpenAI Models), Retrieval Augmented Generation (RAG), ML Algorithms (Regression, Classification, Clustering, Decision Trees)
AI Frameworks & Tools: PyTorch, Keras, Scikit-learn, LangChain, HuggingFace, Pandas, NumPy, MatplotLib

Robotics & Embedded Systems: Basics of Embedded System Design, ROS, MATLAB, Simulink, Microcontroller Development (Raspberry Pi, Arduino and Texas Instruments Launchpads)

Software Development: Node.JS, SvelteKit, React.js, Next.js, Express, Django, Flask, Electron Desktop Apps, MongoDB, SQL and No-SQL Databases, Google Firebase, CI/CD, GitHub Actions, Version Control

PROJECTS & ACHIEVEMENTS

Odysseus (Autonomous Maze-Solving Robot) — September 2023 - Present
Initiated and led the development of an autonomous maze-solving robot student project for IEEE Micromouse, under Randomize();

- the CSE Club. Supervised a 12-member team, delivered the first prototype and transitioned to a mentorship role for ongoing iterations.

LITT: Lightweight Indigenous Text-Transformer February 2024
Hobby Project
Developed and trained a compact text-transformer model independently, from scratch to deepen understanding of transformer-based neural networks, specifically focusing on LLM architectures.

ESP8266 WiFi Repeater January 2024
Hobby Project
Developed a WiFi Repeater using NodeMCU, implemented the NAT Protocol from scratch, and flashed code via esptool.py to enable simultaneous client station and access point functionality, overcoming the default board limitations.

DoomScroll: Leveraging AI and Short-Form Content for Enhanced Educational Engagement among Gen-Z October 2023
Hackathon Project (https://github.com/KrishGoel/doomscroll)
Built an LLM-based short-video generation engine for creating highly-engaging educational content. This project targets the 'Goldfish Attention Span' Crisis in Gen-Z, caused by short-form video content.

CovAID April 2021
Emergency Relief Service (https://krishgoel.com/projects/covaid)
Co-founded CovAID, leading a team of 40 volunteers, to provide real-time, personally verified leads for all COVID-19 resources in Delhi and Kanpur during the height of the Pandemic. Deployed in less than 48 hours. Applauded by several newspapers and celebrities.

Eyena May 2020
Hardware Project (Documentation: https://eyena.krishgoel.com)
Eyena is an IoT-based smart mirror that measures your body temperature upon detecting your presence without any physical contact, built as a solution for health monitoring at public places in the aftermath of the pandemic.

SPEAKING & TEACHING

- **Introduction to Version Control, Git & GitHub:** Collaborated with Somesh Kumar to conduct a comprehensive 4-hour workshop on Git, GitHub, and Version Control. Covered fundamentals and practical aspects. Participants were proficient in creating repositories, committing changes, resolving merge conflicts, and initiating pull requests by the end of the workshop.
- **Building an Artificial Neural Network (ANN) from Scratch:** Conducted an advanced classroom session focusing on the mathematical fundamentals of ANNs. Developed an MNIST classifier using Vanilla Python without any libraries. Discussed the calculus and linear algebra involved, and derived all equations from scratch.
- **AI Fundamentals + Generative AI:** Led a session with Mahek Chandak, covering the role of stochasticity in AI programming. Explained AI concepts through mathematics, including the Bellman Equation for Reinforcement Learning. Demonstrated Language Models (LLMs) as next-word predictors and probabilistic models.
- **Competitive Programming:** Conducted a 3-hour hands-on session to introduce competitive programming and solving strategies and a DSA roadmap to over 300 freshmen. Used animations and visualization to explain and solve problems.
- **Artificial Intelligence for Teachers:** Raghav Sarangi and I delivered a 2-hour webinar on Artificial Intelligence for 280+ teachers at our high school - Sanskriti School, garnering highly positive feedback.
- **Python3 Workshops:** Conducted online Python sessions, gratis, for over 20 kids, during the COVID-19 Pandemic.
- **Programming Fundamentals and Web Development Workshop:** Taught fundamental programming logic (using MIT Scratch) and vanilla web development (HTML, CSS, and JS) to 7 middle-school students during my 10th-grade summer. Earned my first $350 while giving back to the society. Workshop materials, exercises, and daily handouts are accessible here.