BHARAT MISHRA

+91 9161399599 | bharatmishra269@gmail.com | LinkedIn | GitHub | Lucknow, India

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EDUCATION

- **Bachelor of Technology, VIT Bhopal University** | Computer Science Engineering | **CGPA: 9.13** [2023 - 2027]
- **Grade XII, Vidyatree Modern World School** | Percentage: 95.50 [2021 - 2023]

TECHNICAL SKILLS

- **Programming Languages:** C/C++, Python, Java, SQL
- **ML / AI:** TensorFlow, Scikit-learn, FastAPI, Pandas, NumPy, OpenAI Gym
- **Developer Tools:** GitHub, Git, MySQL, Docker, PostgreSQL
- **Core Concepts:** Neural Networks, Reinforcement Learning, Embeddings, Recommendation Systems, Cosine Similarity Search, NLP & LLM Pipelines

AI & MACHINE LEARNING PROJECTS

- **DepoIndex: AI-Powered Legal Document Indexing**
  - Engineered an AI-powered tool to automate the generation of a table of contents from legal deposition PDFs, significantly reducing the manual effort required for **document analysis.**
  - Designed an efficient **preprocessing pipeline** that annotates text with precise page and line numbers, minimizing prompt token count while enabling the LLM to extract topics with accurate source references.
  - Achieved **95% page-level and 85% line-level accuracy** in topic referencing through manual validation, delivering a highly reliable tool for automated document indexing.
- **MovieMix: Latent Semantic Movie Search Engine (MovieLens 25M)**
  - Built a **semantic** search system that converts raw user input tags into 100-D **embeddings**, and retrieves movies via **vectorized cosine similarity against MF-derived movie embeddings**
  - Engineered a **500-token tag vocabulary** and a hypersphere-normalized text-to-vector neural network for solving the **hubness problem** and also fully solving the **cold-start problem** by generating embeddings from tags alone, that achieved **0.52 cosine similarity**.
  - Deployed a fast <50ms **inference pipeline** using **FastAPI + Docker**, enabling production-grade semantic movie retrieval.
- **Search and Rescue Reinforcement Learning System**
  - Developed autonomous agents using Q-learning and PPO to optimize pathfinding in a dynamic, multi-agent search and rescue simulation.
  - **Engineered the simulation environment and its core physics from scratch**, defining the complete state space, action space, and reward functions for the RL agents.
  - Achieved an approximate **90% reduction in target search time** for the trained agent compared to a random-walk baseline.
- **CyberSecurity AI Web Extension for Child Safety**
  - Developed an AI-powered browser extension that detected malicious links with **85% accuracy** as part of a competitive, **state-level Police CyberSecurity Hackathon** focused on child safety.

ACHIEVEMENTS & CERTIFICATIONS

- **Global Rank 8261, TCS CodeVita (2024):** Advanced to the penultimate round by solving complex algorithmic problems.
- **Generative AI Training (Kaggle/Google) (2024):** Transformers, LLMs, and prompt engineering.
- **Google Certified: Computer Networking:** The Bits and Bytes of Computer Networking.

LEADERSHIP AND VOLUNTEERING

- **PR and Outreach Lead, Startup Club:** Secured industry partnerships for guest lectures and sponsorships by coordinating directly with C-suite executives and other industry professionals.
- **Volunteer, Pahal Foundation:** Taught basic mathematics and fundamental elementary education to underprivileged children.