# Harsh Kumar

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## Education

**Vellore Institute of Technology** — Bhopal, India
*B.Tech. Computer Science & Engineering; CGPA:8.42* — *Aug. 2022 – Aug. 2026*
**Courses**: DSA, Computer Networking, DBMS, Object Oriented Programming, Operating Systems, Machine Learning, Cloud Computing

**Army Public School Jodhpur** — Jodhpur, India
*Intermediate and Matriculation* — *Mar. 2019 – May. 2022*
**Courses**: Physics, Chemistry, Mathematics, English and Computer Science

## Skills Summary

**Languages**: C++, C, Python, Java, MySQL
**Frameworks**: PyTorch, TorchVision, TensorFlow, Keras, OpenCV
**Developer Tools**: Git, GitHub, Google Colab, AWS, VS Code
**Libraries**: Pandas, NumPy, Matplotlib, OpenCV
**Tech Skills**: Machine Learning, Deep Learning, Computer Vision, Competitive Programming, OOP
**Soft Skill**: High Agency

## Projects

**SCAN-dinavian: A Chess Board Position Recognition Model** | *Python, PyTorch, TorchVision, PyTorch Lightning*

- Built a deep learning model using **EfficientNetV2-S** to recognize real-world chess positions and convert them into **FEN notations.**
- The model infers all **64 squares simultaneously** predicting both piece type and color for every square, and generates engine-ready **FEN strings** in **0.7–0.9 seconds** per board, enabling rapid integration with **chess engines** like **Stockfish**.
- Used a **hybrid dataset** of **3,000+ Unity-rendered** synthetic and **9,500 crowdsourced** images achieving a **validation accuracy** of **95%** per-square **(Binary 99.9%, Colors 97.4%, Full 95.0%)** across **100 training epochs.**

**Realtime Face Mask Detection** | *TensorFlow, Keras, OpenCV, VGG16, HaarCascade*

- Developed a deep learning-based face mask detection system using **custom CNNs**, achieving **96.2% training accuracy** and **94.3% test accuracy** on a dataset of **7,500+ labeled images**.
- Integrated with **OpenCV** for real-time webcam inference at **30 FPS** on **CPU-only systems**, ensuring smooth performance **without GPU dependency.**
- Utilized **Haar Cascade Classifier** to perform face detection in under **20 ms per frame**, enabling precise region extraction and reducing false positives by **15%** compared to naive detection methods.

## Achievements

- **All India Rank (AIR) 57** and **College Rank 1** in **ICPC Preliminary Round 2024**
- **Pupil** @ **Codeforces** (1325 max.)
- **3 star** coder on **CodeChef**.
- **1608** rating on **LeetCode**.
- **Smart India Hackathon (SIH)** 2024 Internal Round Finalist
  - Selected as one of the top 50 teams from over 430+ idea submissions.

## Certifications

- **Deep Learning Specialization** by DeepLearning.AI
  - Supervised Machine Learning: Regression and Classification
  - Neural Networks and Deep Learning
  - Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization