

# VIVEK RAJ SINGH

Bhopal, Madhya Pradesh

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## Summary

AI Engineer building computer vision systems that solve real-world problems—from analyzing tennis matches frame-by-frame to optimizing crop yields. Hands-on experience training custom YOLOv8 models, deploying production ML pipelines with PyTorch/TensorFlow, and shipping applications users actually interact with.

## EDUCATION

### VELLORE INSTITUTE OF TECHNOLOGY, BHOPAL

2023 – 2027

B.Tech - Computer Science and Engineering (Cloud Computing) - **CGPA - 8.52**

Bhopal, Madhya Pradesh

### Sunbeam English School, Bhagwanpur

2020 – 2022

Higher Secondary: **75.2%** (2021–2022) | Matriculation: **93.2%** (2019–2020)

Varanasi, U.P.

## TECHNICAL SKILLS

- **Languages:** Python, C++, HTML, CSS
- **Databases:** SQL, MongoDB
- **Deep Learning/ML:** PyTorch, TensorFlow/Keras, Scikit-learn, YOLOv5/YOLOv8, ResNet50
- **Libraries:** OpenCV, Pandas, NumPy, Matplotlib
- **Frameworks/Tools:** Flask, Streamlit, Git/GitHub

## PROJECTS

### VPlay - Tennis Analysis System | *Python, YOLOv8, PyTorch, OpenCV, Pandas*

- Developed an end-to-end tennis video analysis system using **YOLOv8** for player tracking and a custom **YOLOv5** model for ball detection across video frames.
- Implemented court line detection using **ResNet50**, predicting **14 court keypoints** for accurate coordinate transformation between video and mini-court visualization.
- Engineered ball trajectory analysis with **Pandas** interpolation, automated shot detection, and real-time calculation of ball speed and player movement statistics.
- Built visualization pipeline with **OpenCV** featuring mini-court overlay, player tracking IDs, and live match statistics rendering.

### AgroVit – Smart Agriculture Recommendation System | *TensorFlow/Keras, Flask, scikit-learn, Machine Learning*

- Built ML-powered agriculture platform with **3 modules**: **10-class CNN** for pest detection, **ensemble model** (SVM, Random Forest, KNN) for crop recommendation, and NPK-based fertilizer optimization.
- Trained CNN using **TensorFlow/Keras** with image augmentation for real-time pest classification; implemented **VotingClassifier** combining 13 models for crop prediction based on soil nutrients and environmental features.
- Deployed production **Flask REST API** with thread-safe model loading, image preprocessing pipeline, and responsive frontend with real-time upload and inference capabilities.

## EXPERIENCE

### BondsPe Financial Services Private Limited

Nov 2025 – Feb 2026

Data Analyst Intern

Remote

- Analyzed bond market data and performed yield comparisons (FD vs Bonds) for fixed income investment research.
- Applied credit risk models including probability of default (PD) estimation and credit spread analysis for issuer risk assessment.

## CERTIFICATIONS

- Completed the **Google IT Support Professional Certificate** covering system administration, networking, and security fundamentals.
- Successfully completed **Infosys Springboard AI Internship**, covering end-to-end AI and ML concepts.
- English Proficiency Certification: **C1 Advanced** (EF SET).