

# Accurate Detection and Recognition of Dirty Vehicle Plate Numbers for High-Speed Applications

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# Agenda

- 1. Introduction & Problem Statement
- 2. Literature Review
- 3. Proposed Methodology
- 4. Novelty & Contribution
- 5. Gap Analysis
- 6. Timeline & Work Plan
- 7. Conclusion & Future Scope

# Introduction & Problem Statement

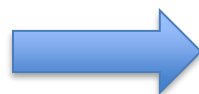
- - Importance of License Plate Recognition (LPR)
- - Challenges:
  - • Dirt/Mud/Obstructions
  - • Motion blur at high speeds
  - • Reduced recognition accuracy → fraud & enforcement gaps
- - Goal: Robust recognition of dirty/obscured plates at high speeds.

# Literature Review

- Existing ANPR Systems: Fail under dirt/motion blur
- OCR Optical Char Recognition (Tesseract, CNN): Reduced accuracy on noisy images
- GAN Generative Adversarial Networks-based Augmentation: Limited real-world use
- Conclusion: Need for robust dirty plate recognition.

# Proposed Methodology

- 1. Image Acquisition → Kaggle datasets
- 2. License Plate Detection → YOLO
- 3. Object Segmentation → Isolate plates
- 4. Character Recognition → Tesseract/CNN
- 5. Fraud Detection → Repeated failures flagged



YOLO



Gets Number  
Plat from Car



CNN Tesseract  
OCR



GY59KLL

Try to detect  
Actual Number



Fraud  
Alert



# Algorithms to Explore

- • YOLO → License Plate Detection
- • Tesseract OCR → Baseline Recognition
- • Custom CNN → Dirty plate recognition

# Novelty / Contribution

- - Dirty Plate Simulation → Image augmentation
- - Custom CNN for OCR → For noisy/dirty plates
- - Fraud Detection Layer → New addition
- - Real-time Suitability → Optimized for highways



# Gap Analysis

- Existing Systems:
  - - Good for clean plates
  - - Poor dirty plate accuracy
  - - Minimal fraud detection
- Proposed Work:
  - - Dirty plate accuracy improved
  - - Dedicated fraud detection
  - - Real-time, high-speed suitable

# Timeline of Proposed Work

- Phase 1 (Current) → Literature Review, Dataset Collection
- Phase 2 → Model Design & Training (YOLO & OCR)
- Phase 3 → Testing & Validation
- Phase 4 → Final Integration & Report Writing

# Conclusion & Future Scope

- - Robust LPR for dirty/high-speed vehicles
- - Future Scope:
  - Real-time system integration
  - Edge AI deployment
  - GAN-based preprocessing exploration