GeeksforGeeks

HACKTIVATE 2025

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TITLE PAGE

1. Problem Statement Domain: Student Innovation
2. Problem Statement Sector: Automotive Service & Maintenance
3. Problem Statement Title: Smart AI Solution for Cleaner and Safer Cars
4. Team Name : ASTAS
5. Institution: JUET-GUNA
6. State: Madhya Pradesh

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PROBLEM STATEMENT

Traditional car wash and repair services lack efficiency, transparency, and personalization. Key challenges include:

1. **Inefficient Inspections**:
   - Manual assessments of dirt and damage are time-consuming and error-prone.
   - There is no seamless system for both pre-wash and post-wash inspections.
2. **Low Customer Engagement**:
   - Lack of visible evidence for repair recommendations reduces trust.
   - Limited personalization of services and offers impacts customer satisfaction.
3. **Environmental Concerns**:
   - Conventional washing methods waste water and resources.
   - Sustainability opportunities remain untapped.

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SOLUTION OVERVIEW

An AI-based station inspection system. It creates new, attractive, and custom offers, promoting sustainable, cost-efficient cleaning and repairing services, connecting stations with GALP network partners using a new shared service paradigm

Key Features:

1. **AI Dirt Inspection**:
   - Camera sensors detect dirt levels on the car and provide instant results via a mobile app.
   - Customized washing procedures follow customer approval.
2. **Post-Wash Damage Detection**:
   - After cleaning, It uses AI to identify damage like scratches or broken glass, offering repair options from partner networks.
3. **Personalized Offers**:
   - Customers receive tailored service offers based on inspection results, promoting engagement and loyalty.

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CORE FEATURES

Core Features

1. **AI-Powered Dirt Inspection**
   - Camera sensor detects dirt on car parts.
   - Instant digital results displayed on a mobile app.
   - Customized washing procedure after customer approval.
2. **Post-Wash Damage Detection**
   - AI identifies damage (scratches, glass breakage, etc.) after washing.
   - Displays repair options from partner networks.
3. **Personalized Service Offers**
   - Tailored offers based on inspection results.
   - Increases customer engagement and loyalty.
4. **Eco-Friendly Operations**
   - Optimized washing process reduces water and resource usage.

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TECH STACK

- **OpenCV** is used for real-time image processing and dirt detection due to its efficiency in handling visual tasks.
- **TensorFlow / PyTorch** are utilized for building deep learning models to detect damage and dirt levels in the car.
- **Hugging Face** is chosen for cloud deployment, enabling scalable and efficient hosting and inference of AI models.
- **Labelbox** is used for labeling datasets accurately, which helps in training the AI models.
- **Water Usage Management** systems are integrated to optimize and track water usage during the cleaning process, ensuring sustainability.

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PRACTICALITY & IMPACT

Viability:

This smart AI leverages AI, computer vision, and cloud deployment to offer an efficient, scalable solution. Using **OpenCV** and **TensorFlow/PyTorch**, the system ensures accurate dirt and damage detection, while **Hugging Face** enables seamless cloud hosting.

Beneficiaries:

- **Car Owners**: Receive personalized, transparent, and efficient services.
- **Service Stations**: Benefit from streamlined operations and enhanced competitiveness.
- **Repair Providers**: Gain access to new customers through AI-driven damage detection.
- **Environment**: Reduced water and resource usage supports eco-friendly practices.

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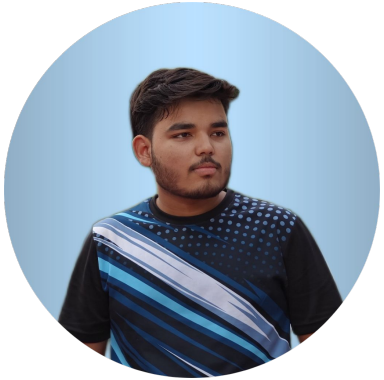
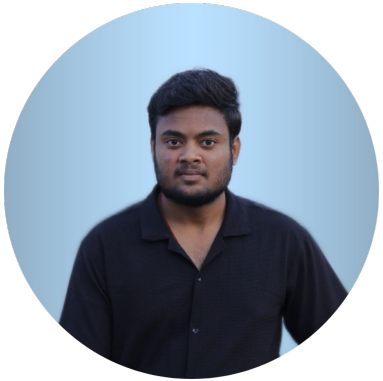
TEAM



RUSHIL SHARMA
Lead

RITHUIK PRAKASH



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~ASTAS