

TEAM ACE

09.03.2024

TRI-NIT 3.0 Hackathon Submission

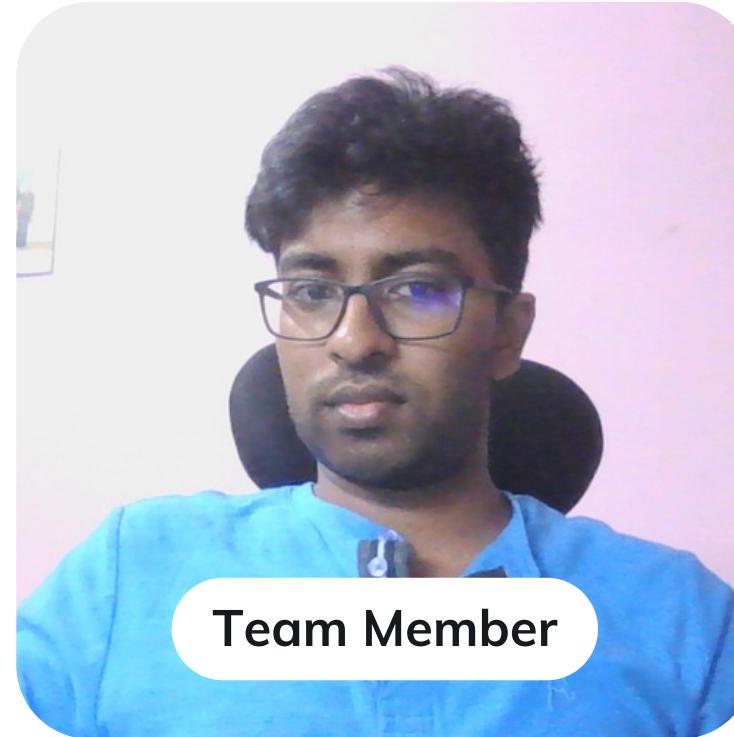
Our Team



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PROBLEM STATEMENT

ML 01 - AUTOMATED ROAD DAMAGE DETECTION FOR INFRASTRUCTURE MAINTENANCE

- Automation: Develop a classification model to automatically detect and categorize road damage from images.
- Efficiency: Reduce reliance on manual inspections, leading to timely repairs and efficient infrastructure management.
- Safety: Ensure safe and well-maintained road networks by enabling targeted repairs based on automated damage detection.



OBJECTIVES

MODEL DEVELOPMENT

Utilize YOLO or R-CNN for road detection, implement a classification model for damage identification, and deploy via Firebase for real-time access.

REAL-TIME MONITORING

Users can access real-time road damage alerts via Firebase and monitor road conditions through an intuitive interface, facilitating timely interventions and maintenance efforts.

ACTION PLAN

CHECKPOINT - 0

Choosing the Problem Statement

CHECKPOINT - 1

Comprehensive Study of the Dataset

CHECKPOINT - 2

Training & testing an optimal model

TECH STACK

FRONT END

Next JS & React JS - Utilize Next.js and React.js for frontend development to enable users to access real-time road damage alerts via Firebase and monitor road conditions through an intuitive interface, facilitating timely interventions and maintenance efforts.

BACK END

We tried various algorithms like **U-Net**, **YOLO v5**, **YOLO v8**, **YOLO v9**, **Masked RCNN** and **Single Shot Multibox Detection**.

OUTPUT (FRONT-END)

Team Ace

Road Health at Your Fingertips

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Real Time Damage Detection

Select The Country

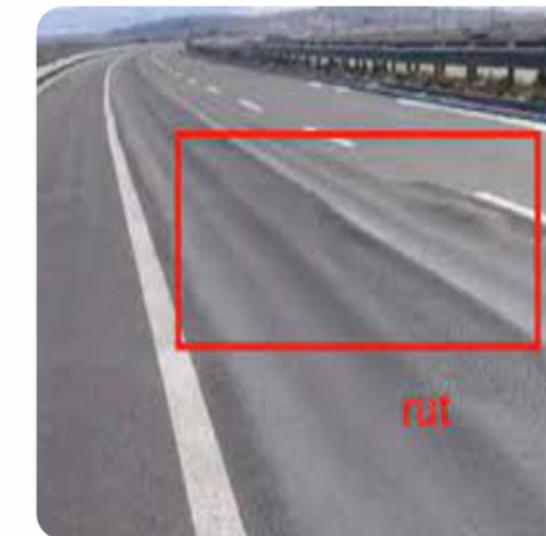
✓ Select Country

India

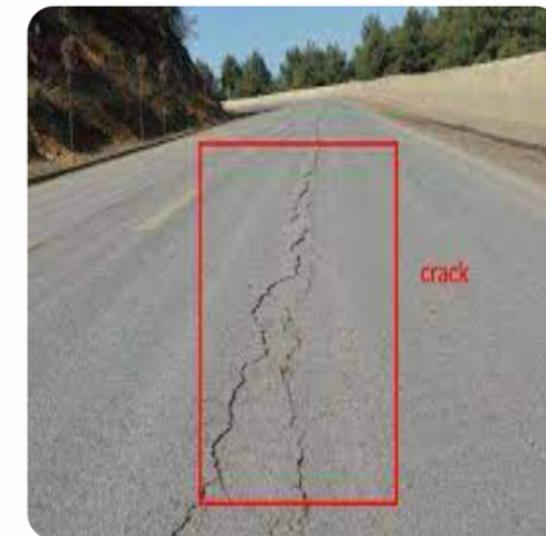
Japan

Czech

Check Your Road



Finding ruts!



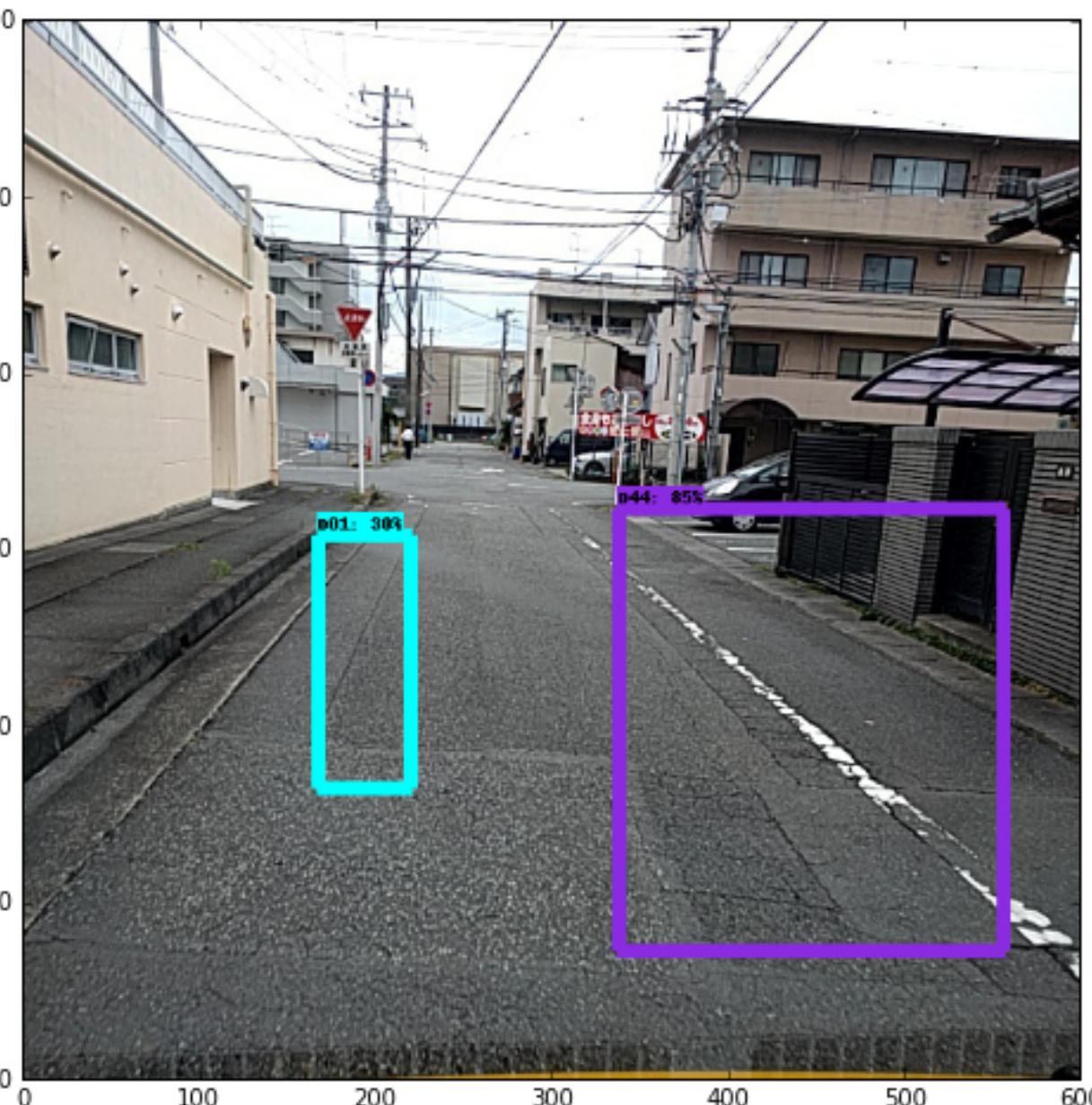
Finding cracks!

Home Page - Ace

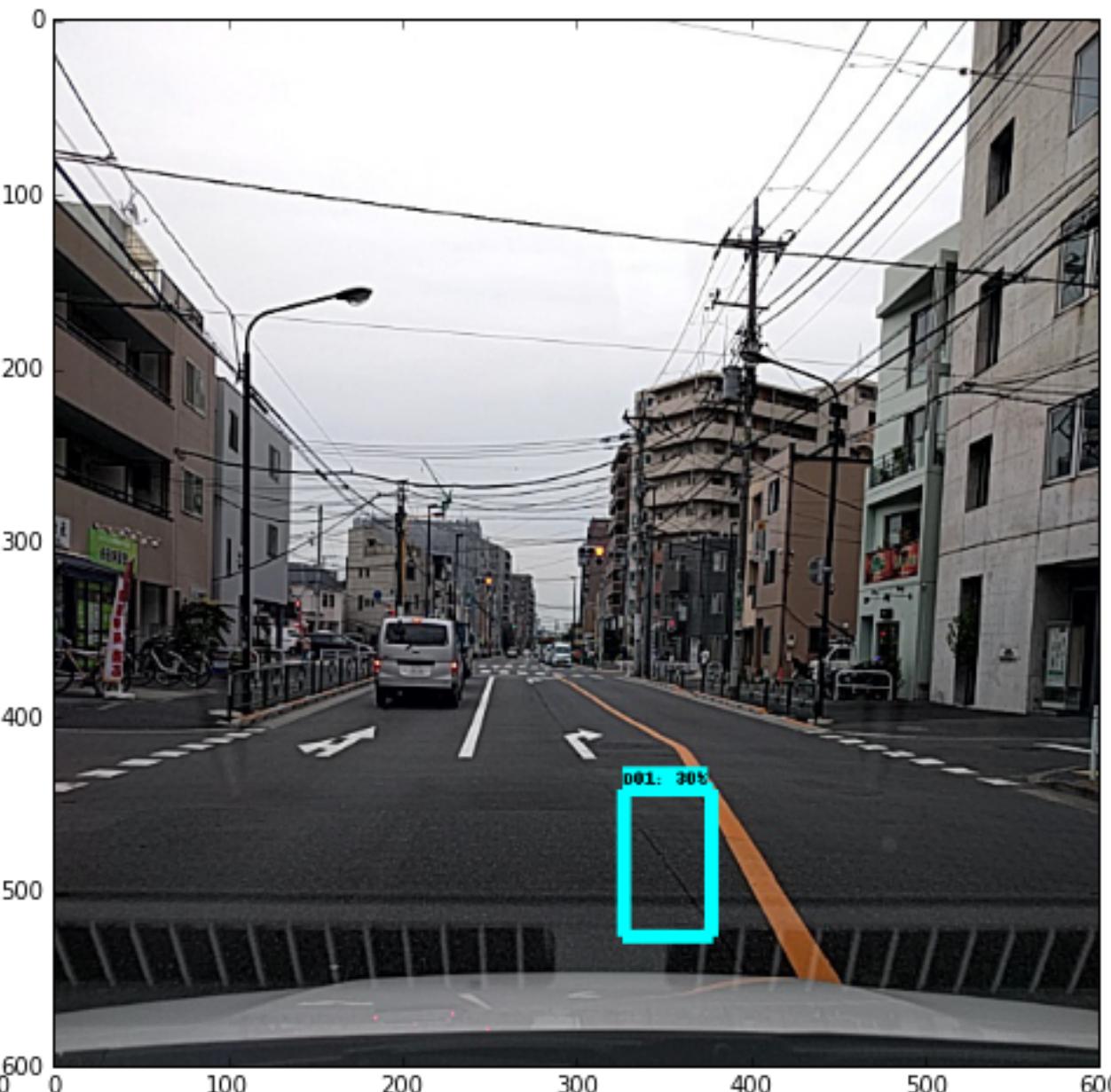
OUTPUT (BACK-END)



Road Damage D00 Detection



Road Damage D01 & D44
Detection

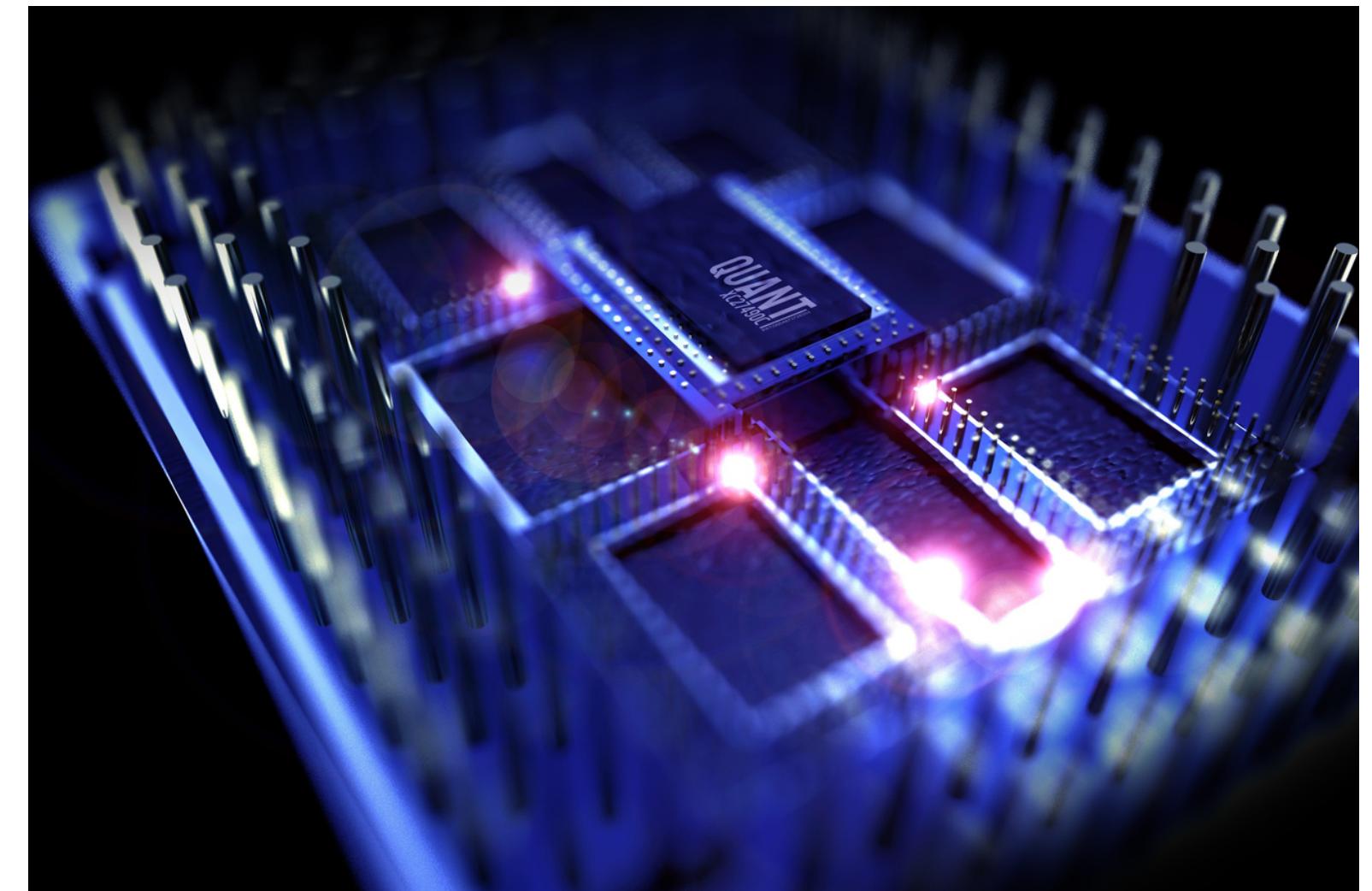


Road Damage D01 Detection

FUTURE WORK

TO DEPLOY THE MODEL USING QUANTUM COMPUTATION (QISKIT)

Leverage Qiskit to deploy the model, tapping into quantum computation for advanced functionality and performance.





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