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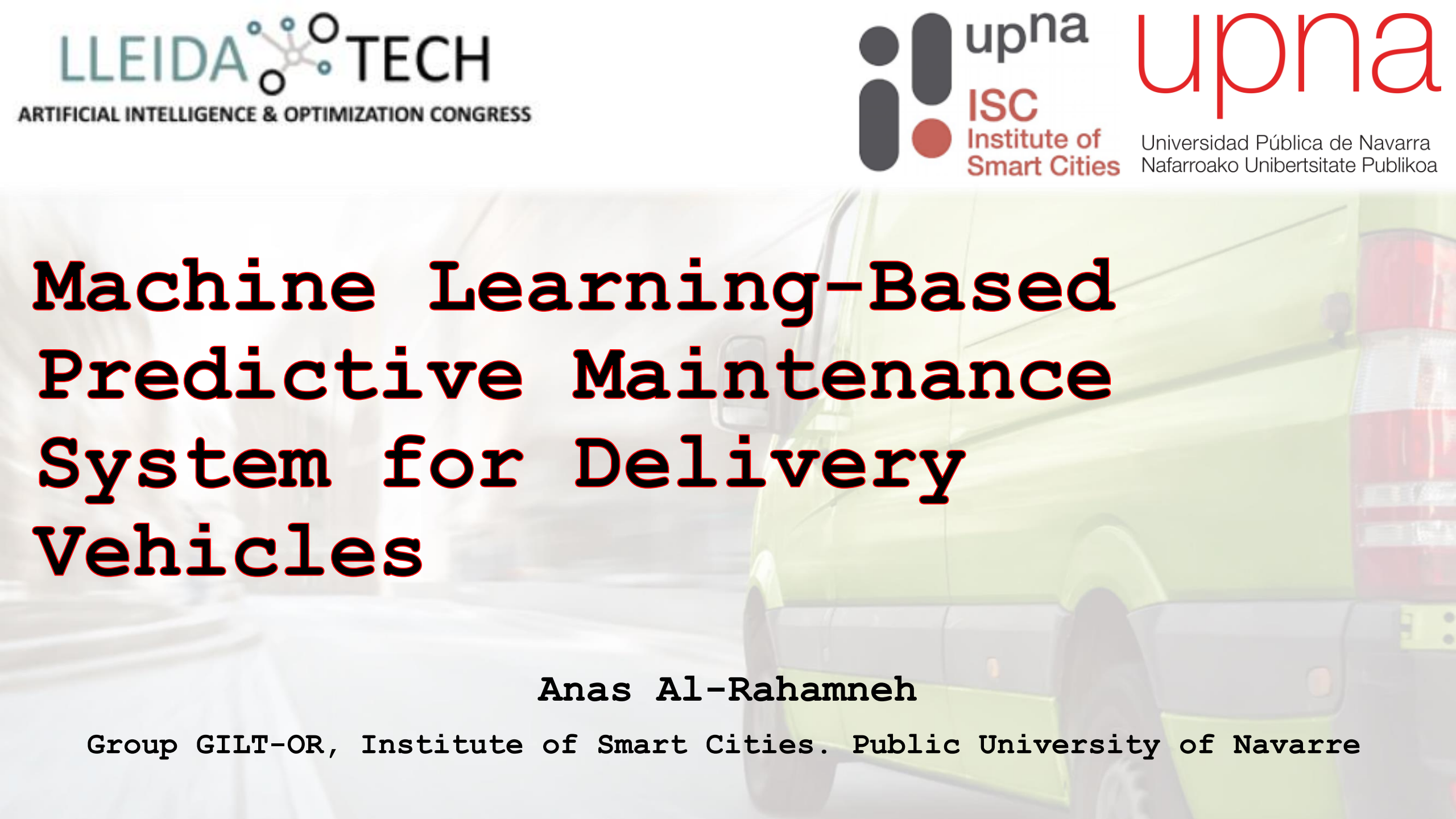

Machine Learning-Based Predictive Maintenance System for Delivery Vehicles

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INTRODUCTION

- **Last Mile Delivery: The final step in the supply chain where a product is transported from a distribution center to the customer's doorstep.**

- **Last mile delivery is a critical component of the supply chain that directly influences customer satisfaction and operational efficiency.**
- **Challenges:**
  - **Failed Deliveries:** Attempts to deliver packages can fail due to recipients being unavailable, incorrect addresses, or other unforeseen issues, leading to additional costs and delays.

INTRODUCTION

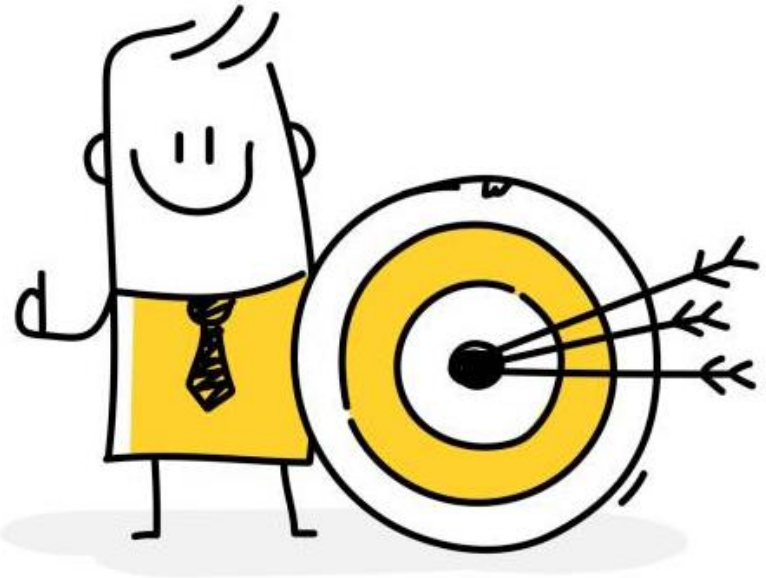
- Delivery truck breakdown:
  - Direct Costs:
    - Repair Expenses.
    - Replacement Vehicles.
    - Towing and Recovery.
  - Indirect Costs:
    - Delivery Delays.
    - Customer Dissatisfaction.
    - Operational Disruptions.
    - Competitive Disadvantage.

INTRODUCTION

- Key measures that can help avoid breakdowns:
  - Regular Maintenance and Inspections:
    - Scheduled Servicing: Adhere to manufacturer-recommended maintenance schedules for engine checks, oil changes, brake inspections, and other critical components.
    - Routine Inspections: Conduct daily or weekly vehicle inspections to identify and address potential issues before they lead to breakdowns..

OBJECTIVE

- Our objective is to reduce truck breakdown incidents by employing advanced machine learning algorithms to detect early signs of potential engine failures.



METHOD

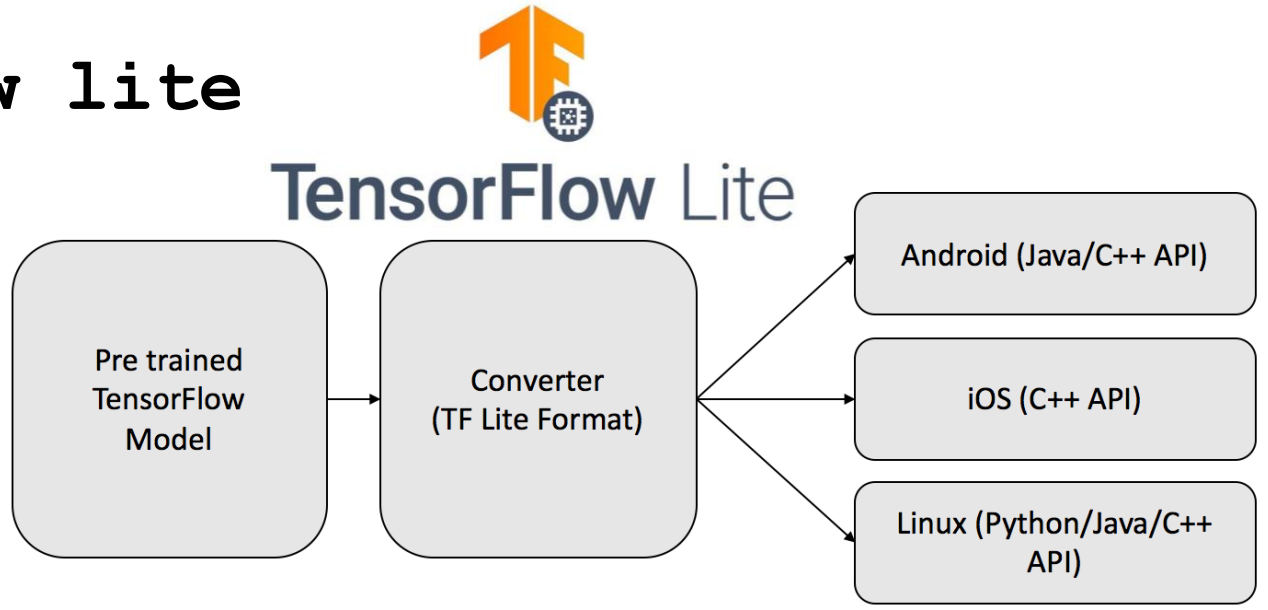
- Dataset:
  - On-Board Diagnostic II (OBD-II)
  - Source:https://www.kaggle.com/datasets/cephasax/obdii-ds3
  - 19535 Data Points.

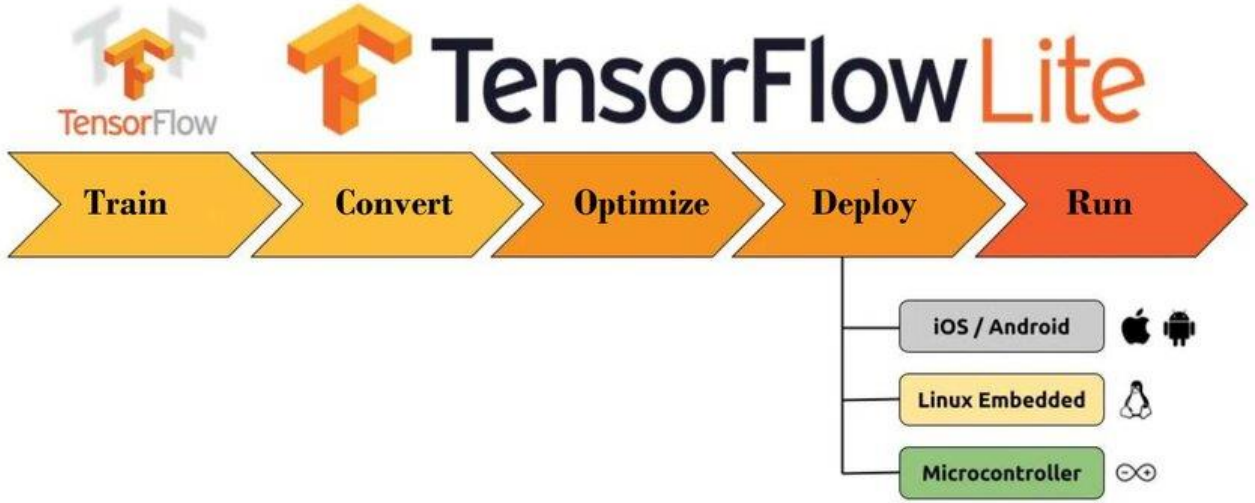
METHOD

- **Input:**
  - **Six Features**
    - Engine rpm
    - Lubricating Oil Pressure.
    - Fuel pressure.
    - Coolant Pressure.
    - Lubricating Oil Temperature.
    - Coolant Temperature.
- **Target:**
    - Engine Condition
- **Model :**
  - **Multilayer Perceptron (MLP)**

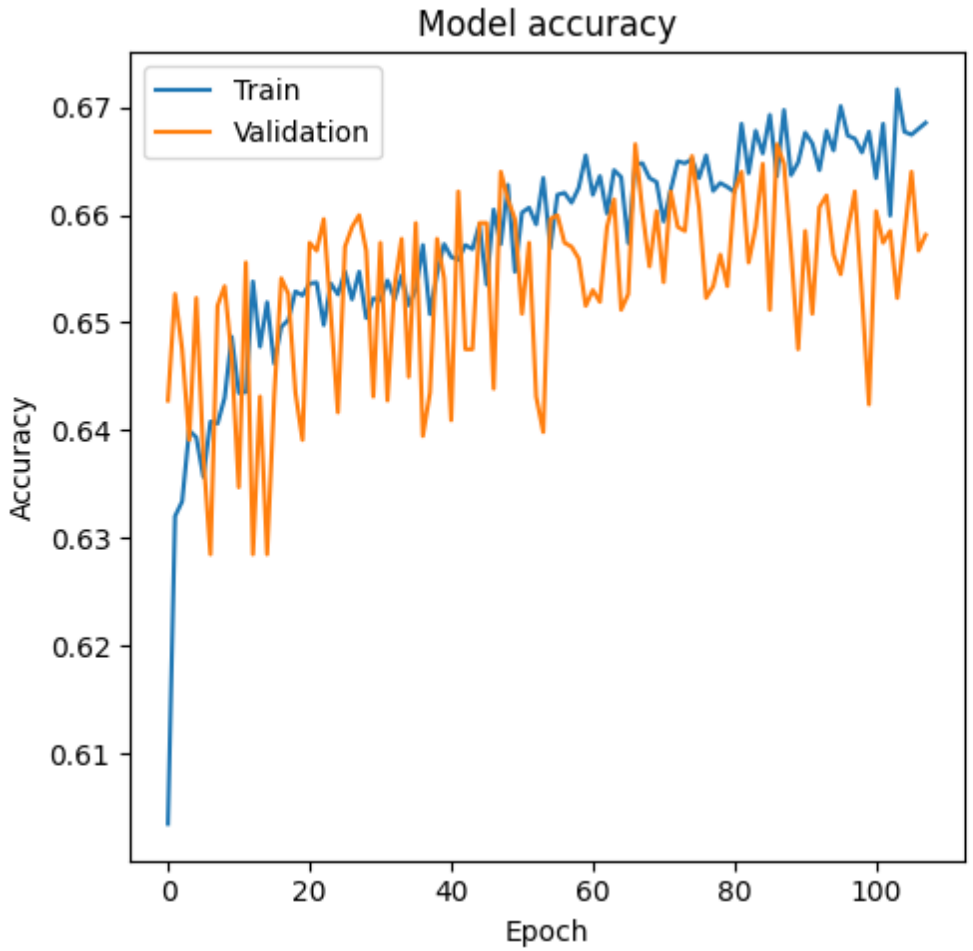
METHOD

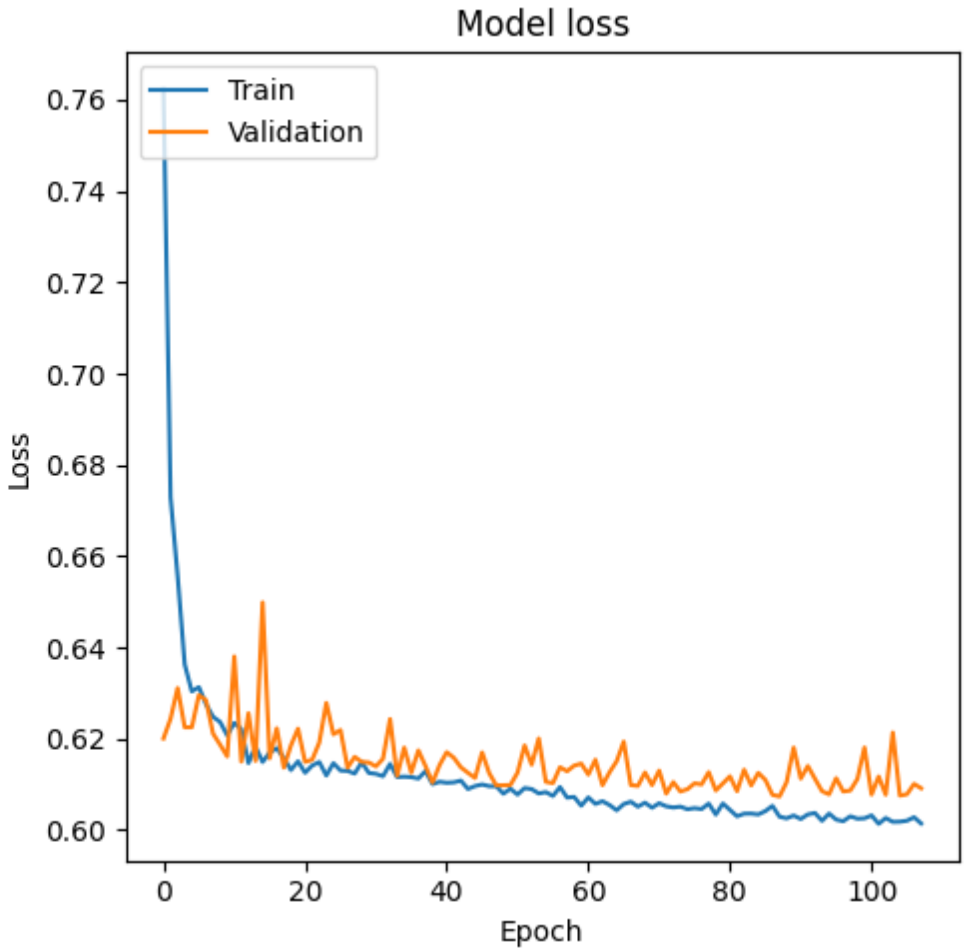
- **TensorFlow lite**





Preliminary Results





- **Loss function: Binary Cross Entropy**


LIVE DEMO


thank you