**Pothole Detection using AI (YOLOv8-seg pretrained NN Model)**

**Colab Notebook link— Denoted in our GitHub page.**

**Dataset link--** [**https://app.roboflow.com/umkc-dcg9f/yolov8-pothole/browse**](https://app.roboflow.com/umkc-dcg9f/yolov8-pothole/browse)

**About YOLO:**

YOLO, or You Only Look Once, operates through a methodology that involves the division of an input image into a grid, enabling localized object detection and plays a key role for instant segmentation. Within each grid cell, the algorithm predicts multiple bounding boxes, each associated with confidence scores reflecting the likelihood of an object's presence. Concurrently, class probabilities for different object categories are determined within these bounding boxes using softmax activation.

**METHODOLOGY:**

The suggested approach consists of the following four steps:

* Data collecting using wide sources.
* Data preprocessing and annotation using a third-party service (for example Roboflow) and dividing the entire dataset into train, valid and test datasets.
* Training a pre trained YOLO deep learning model (almost 200-layer neural network) from Ultralytics module to instantly identify patched and potholes; and optimization of the hyperparameters to produce a more effective model. Data collection was the experiment's first phase.

**Regarding team contribution:**

1. **Veera Poorna Prakash Reddy Chekkera- Performed Model building and platform setup for data and model. Managed timelines, resources, and potential challenges.**
2. **Sreesanth Reddy Samala – Evaluated model performance and designed poster for the project. Helped in giving inputs regarding the concepts of Yolov-segmentation.**
3. **Bharath Tutte – Connected with Venkat regarding initial idea on model building, and developed algorithms based on the sensor input. Monitored project progress by communicating with each person.**
4. **Teja Kammineni – Created Visualizations of the model to make interpretation easier, and made analysis using the entire data. Involved in data collection and annotation parallelly.**
5. **Tirumala Rao Vuddanti – Involved in data collection and annotation.**
6. **Teja Gurramkonda – Involved in data collection and annotation.**
7. **Jyothirmai – Involved in data collection and annotation.**

In a nutshell, each individual offered their skills to various elements of the project, including hardware setup, software development, data analysis, network infrastructure, user interface design, and project management. Effective communication and collaboration are critical for the project's success.