Group-FTL\_Myanmar\_Gr10

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**Proposal Submission** - **Predicting Road Accident Risk**

**1. Project Idea:**

* Project Idea - Predicting Road Accident Risk Using Data Analytics
* Problem Definition -Road accidents are a major global issue, often lacking real-time predictive methods to prevent them. Current systems fail to consider dynamic factors like weather, traffic, and time, leading to missed opportunities for timely interventions.
* Goal - To develop a machine learning model that predicts the risk of road accidents in real-time by analyzing multiple factors such as weather conditions, traffic density, time of day, and location. This model will support improved decision-making for preventive measures and resource allocation, ultimately contributing to reduced accident rates.

**2. Relevance to Sustainable Development Goals (SDGs):**

* Supports SDG 3: Good Health and Well-Being by predicting high-risk areas for road accidents, helping reduce injuries and fatalities.
* Contributes to SDG 11: Sustainable Cities and Communities by promoting safer roads and proactive traffic management.
* Leverages machine learning to provide data-driven insights, minimizing human suffering and improving public safety.

**3. Literature Examples:**

1. ***Prediction of Road Accidents Using Machine Learning Algorithms,***R.Vanitha & M.Swedha:The study used machine learning on 1.6 million records to predict road accident severity with Logistic Regression, Decision Tree, and Random Forest. Their work supports using structured data for interpretable accident risk prediction.
2. ***Graph Neural Networks for Road Safety Modeling: Datasets and Evaluations for Accident Analysis***, Abhinav Nippani, Dongyue Li, Haotian Ju, Haris N. Koutsopoulos, Hongyang R. Zhang: The study introduces a large U.S. accident dataset and shows that Graph Neural Networks accurately predict accident occurrences and counts using multitask and transfer learning.

**4. Describe Your Data:**

* Source of dataset: [Kaggle - Predicting Road Accident Risk](https://www.kaggle.com/competitions/playground-series-s5e10/overview)
* Format: csv, size: 52 MB total, 517754 rows in training data
* The dataset include road's characteristics (like road\_type, num\_lanes, curvature, speed\_limit, road\_signs\_present, public\_road), environmental conditions (lighting, weather), and temporal factors (time\_of\_day, school\_season, holiday) with num\_reported\_accidents and **accident\_risk**.

**5. Approach (Machine Learning or Deep Learning):**

* We’ll employ machine learning approach because the dataset is structured and tabular and the task is to predict a number which is a regression problem. The interpretability is also a crucial factor for a problem like accident risk.