Paper 1

Online Link = " Safe speeds: fatality and injury risks of pedestrians, cyclists, motorcyclists, and car drivers impacting the front of another passenger car as a function of closing speed and age "

What dataset did you use?

- Dataset: GIDAS (Germany), 1999–2020
- Features: Speed, age, injury level, safety use, crash type, year
- Processing: Data weighted to match national accident statistics

Which ML model did you use?

- Model: Logistic Regression (binary classification)
- Target: Injury (1 = injured, 0 = not injured)
- Inputs: Closing speed, Age
- Models tested:
    - Model 1: Speed only
    - Model 2: Speed + Age (better)
- Evaluation: 5-fold cross-validation, ROC & AUC
- Purpose: Create injury risk curves for different road users

What did the result show?

Topic	Result
Model Performance (AUC)	0.66 – 0.94 (good)
Highest Risk User	Pedestrian
Lowest Risk User	Car occupant
Safe Closing Speed (10% MAIS3+F)	Ped: 29, Cyclist: 44, Motorcyclist: 48, Car: 112 km/h
Safe Vehicle Speed	Ped–Car: 25, Bike–Car: 20–25, Car–Car: 55 km/h
Safety Equipment Effect	Helmet, jacket, AEB increase safe speed
Main Limitations	Low motorcycle data, wide uncertainty

4. What did they say about future work / limitations at the end?

- Limitation
  - Only car hits from front were studied
  - Other crashes were not included
  - Age was used in a simple way
  - Children were not included
  - Only injury accidents were used

    - Old vehicles are in the data
    - Data is from Germany only
    - Gender was not used
- Future Work
    - Study other types of crashes
    - Include more vehicles
    - Use new safety technology data
    - Use better models for age
    - Compare with other countries
    - Add gender and social data
    - Improve zero-speed risk idea
    - Use model in smart cars

Paper 2

Online Link = " Automated Construction of Time-Space Diagrams for Traffic Analysis Using Street-View Video Sequences "

What dataset did you use?

- KITTI = real road data from car cameras & sensors
- Images, videos & LiDAR = see roads and object distances

- GPS & calibration = know car location & measure correctly
- Annotations = label cars, people, and other objects
- YOLOv5 + StrongSORT = detect and track objects, estimate distance

Which ML model did you use?

- No traditional ML = Linear Regression, Random Forest, etc. were not used
- YOLOv5 = CNN-based model for real-time object detection, fine-tuned on KITTI
- StrongSORT = tracks multiple objects while moving
- Distance estimation = uses camera geometry & GPS, not ML
- Summary = research uses deep learning & computer vision, not classic ML models

What did the result show?

What	**Result**
YOLOv5 Detection	Vehicles detected very well (mAP ~0.78–0.79)
StrongSORT Tracking	Vehicles detected very well (mAP ~0.78–0.79)

Distance & Trajectory	Some errors (RMSE 1.4–4.4 m, flickering boxes)

What did they say about future work / limitations at the end?

- Limitation
  - Sometimes the car looks too close or too far
  - Boxes around cars and people jump or disappear
  - Only one road video (KITTI) was used
- Future Work
  - Use LiDAR or RADAR to see distance better
  - Teach the computer with more roads and smooth paths
  - Try fake roads in a simulator
  - Mix moving cameras with fixed cameras

Paper 3

Online Link = " Linear Regression-Based Traffic Flow Simulation: Vehicle Density and Speed Analysis on Buah Batu Road "

What dataset did you use?

- Speed = Road length ÷ Time
- Density = Cars coming ÷ Max cars
- Dataset has: No, T in, T out, Speed, Density
- Main features are Speed & Density
- Other columns are just helpers

Which ML model did you use?

- They used Linear Regression
- To see how Speed and Density are friends
- The formula : v(p) = -6.904 + 4.302p
- Intercept = -6.904, Slope = 4.302
- No tricky models like Random Forest or Neural Net

What did the result show?

Thing	**Happened**
Model	Linear Regression
Fit	Graph looks okay
Metrics	No numbers like RMSE
Simulation	Traffic spreads, jam goes down
Next Steps	Add metrics & try cool models

What did they say about future work / limitations at the end?

- Limitation
  - Only Linear Regression
  - No real-time traffic
  - Only Speed & Density
  - Used Upwind math
  - Model is simple
- Future Work
  - Try non-linear or ML models
  - Add real-time & smart traffic data
  - Add weather, road, and driver factors
  - Try better numerical methods
  - Make it more complete & realistic