**Smart India Hackathon (SIH’24): SynoDrive**

**SynoDrive Technical Features:**

1. Urban Traffic

- V2V and V2I communication optimize vehicle approach to traffic lights.

- CAVs adjust speed in real-time to avoid abrupt stops.

- Traffic prediction models suggest alternate routes to avoid congestion.

- AI models adjust lane coordination to reduce bottlenecks.

2. Highway Merging and Lane Changing

- V2V communication ensures vehicles are aware of speed and position.

- System calculates optimal merging times for smooth integration.

- AI-driven models assist in safe lane changes based on vehicle proximity.

- V2I systems control entry ramps and adjust traffic density.

3. Emergency Vehicle Coordination

- V2V systems detect emergency vehicles and alert nearby CAVs.

- CAVs create emergency lanes by adjusting speed or moving aside.

- Traffic lights adapt to prioritize emergency vehicles.

- AI models reroute non-emergency vehicles to avoid congestion.

4. Pedestrian and Cyclist Detection

- Sensors detect pedestrians and cyclists; data shared via V2I.

- AI models predict pedestrian and cyclist movement to adjust speed.

- CAVs stop at crosswalks or avoid overtaking in cycling zones.

5. Adaptive Speed Control in Changing Weather Conditions

- V2I systems provide real-time weather updates.

- CAVs adapt speed and braking distance based on road conditions.

- AI models predict hazards like slippery roads for proactive adjustments.

6. Traffic Congestion Management in Major Events

- V2I and V2V systems detect increased traffic flow near events.

- AI models reroute vehicles through less congested roads.

- CAVs optimize speeds and travel in platoons to reduce road capacity usage.

- Traffic lights and smart signs adjust to event-based patterns.

7. Accident Prevention and Response

- V2V alerts trigger evasive maneuvers and slowing in case of sudden braking or veering.

- AI models predict crash risks and adjust speeds or issue warnings.

- V2I systems notify emergency services and reroute traffic around accidents.

8. Platooning (Coordinated Group Driving)

- CAVs form platoons, traveling together at synchronized speeds to reduce fuel consumption.

- V2V ensures coordinated braking and acceleration within the platoon.

- AI models optimize routes and adapt to road conditions.

9. Rural or Low-Traffic Scenarios

- CAVs rely on V2V communication for local data sharing.

- AI systems adapt driving style based on sensor data (e.g., uneven roads).

- CAVs use sensors for safe decisions at intersections without traffic lights.

**Visionary Pictures:**

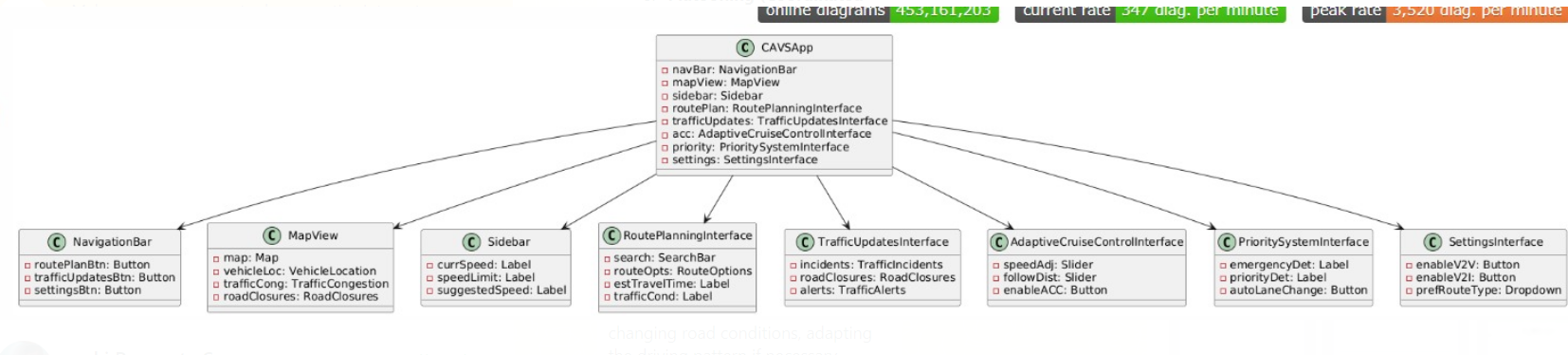
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