

Automated Emergency Braking

Specific focus on vulnerable road users

Introduction

Today, while SAE Level 5 autonomous vehicles are still in development and most autonomous vehicles on road are SAE L4, incremental autonomy is the immediate focus area for majority of the industry players. Advanced Driving Assist Systems (ADAS) features starting from basic L1 features like automated emergency braking and going up to L3 features like automated valet parking, smart summon, rear parking etc. has been focus areas for Wipro. The safety of road users and the occupants of the vehicle is the end objective. With Automated Emergency Braking (AEB), safety of road users, and more specifically vulnerable road users (VRU) - pedestrians and bicyclists, is the problem we intend to address.


Key Takeaways

Understanding Automated Emergency Braking and its reach

The AEB solution raises an alert with an object in close proximity alarming the driver to take an action or it handles the braking action. Automated Emergency Braking is used today in most vehicles.

Understanding how cognitive decision making plays an important role in AEB

Our algorithms predict the behavior of dynamic entities like pedestrians, bicyclists, vehicles, motorbikes etc. and only then decide to apply brakes or else chart a trajectory for object avoidance for a smooth ride.



The AEB for VRU feature focuses on specially designated city zones (school districts, etc.) and ambient conditions (infrastructure provided light, dawn or dusk)

Key Benefits

Safety of other road users

- Automated Emergency Braking for vulnerable road users (AEB VRUs) ensures that safety of the other road users is taken care of, as VRUs are prone to fatal accidents on road.
- Edge cases or corner cases are defined keeping in mind these users. Pre-crash scenarios leading to accidents at intersections are studied and learnings incorporated into the basic algorithms.
- Analyzing behavioral patterns of different pedestrians. For instance, how a child is more likely to dash in front of a vehicle or how an old man may get into an accident owing to poor judgement of the driver due to his speed of walking.

Safety of the driver in case of distracted driving or limited ambient lighting conditions etc.

- AEB helps with situations like night driving or driving in extreme weather conditions, or driving at dawn/dusk when the sun glares into the face of the driver.
- Similarly, distracted driving or driver drowsiness may lead to fatal accidents, which can also be avoided with the help of AEB.

Features

Detecting objects, identifying them, tracking, and eventually predicting their behavior

Being able to differentiate a child from a teenager or from an aged man is necessary to be able to predict their next move and be ready with different decisions based on their actions.

Location or zone sensitivity

Intersections are accident-prone areas, but a lot of the fatal accidents happen in deserted locations (sometimes not well lit). Specially designated zones like school zones, university districts etc. will imply more children on the roads and hence need special attention.



Automated Emergency Braking helps reduce the number of fatal accidents on roads drastically

Wipro Limited
Doddakannelli,
Sarjapur Road,
Bangalore-560 035,
India

Tel: +91 (80) 2844 0011
Fax: +91 (80) 2844 0256
wipro.com

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For more information, please write to us at info@wipro.com