Decision-making algorithm

The decision-making algorithm of the system is essential to ensure safe working. The algorithm decides how to interact based on the environment conditions and the exact position and movement of the animals.

If the system is active, the infrared cameras scan the environment of the car without interruption to detect wild animals. The AI system running in the ECU is able to differentiate between diverse sources of heat, like humans, small animals (birds, cats, etc.), and other cars. If only one camera sees an animal, it’s outside the danger zone. In this case, the probability of crash in this moment is zero. In this case, the system won’t interact in any way. If both cameras see the animal, the animal is in the danger zone (due to the common field of view of the two cameras defined as the “danger zone”).

In this case, the system calculates whether there’s a possibility of crash. The system uses the dynamics data of the car and the calculated trajectory of the animal to check the chance for collision. If collision is not possible, for example the animal only stands next to the road, the system informs the driver of the potential hazard by a short sound signal and an animal warning message appearing on the cockpit. The videos captured by the cameras are streamed to the main infotainment screen, so that the driver can more easily locate the animal with the heat camera pictures. If collision is probable, the car automatically starts braking till the car reaches 50 km/h.

The reason for only braking till 50 km/h is that under 50 km/h, the urban pedestrian/cyclist collision avoidance system is activated in cars equipped with Bosch Multi-Purpose Camera. If this system detects a possible crash with an object jumping in front of the car, it performs emergency braking. So the decision of emergency braking is given to the more advanced Multi-Purpose Camera System, while the infra cameras support this by slowing down to the appropriate speed and detecting animals way before the classic cameras could see them.

So if the car is slowed down and the animals jumps in front of the car, the car performs emergency braking. Otherwise, the driver is alerted more heavily than before, by infotainment-screen video, flashing lights, sound signals and potentially via the Head-Up Display. (For more details, see the Hardware section).

