arbe

All-Environment 360° Perception

Every-Scenario Safety. Radar Data Only.

In too many common driving scenarios, today's leading automotive sensor technologies fall short. Through an AI-based analysis of the vehicle's surroundings, Arbe's 360° Perception is critical for enabling safety in everyday use cases, such as:

Pedestrian detection in complicated urban settings or in the dark

Lane changing and maneuvering in the dynamic highway environment

Obstacle avoidance in all weather and lighting conditions

Transforming Road Safety from Every Perspective

Achieving the best radar-based image quality on the market, Arbe's Perception differentiates true threats from false alarms to ensure a safe road ahead for drivers, pedestrians, and other vulnerable road users.

- 360° Perception
- Free Space Mapping
- Object Tracking
- Object Orientation
- Ego Velocity
- SLAM

Arbe created the first radar technology detailed enough to enhance perception algorithms, providing critical sensing data diversity, such as depth, relative velocity, object orientation, and long-range detection at levels optical sensors can't match. It accomplishes all of this even in environmental conditions where optic sensors fail, making it a critical sensor for reliable redundancy.

The surround data captured by Arbe's perception radars, which leverage AI to identify, classify, and track objects in 360°, is processed in real-time to create a full free space map around the vehicle, as well as an analysis of the evolving hazards sensed by the radars.

From emergency braking to cyclist and pedestrian detection, and from lane change to highway autopilot and traffic jam assist, L2+ and higher applications have so far been mostly about driver comfort. By perfecting these applications in all environmental conditions, Arbe elevates them from a nice-to-have comfort solution to must-have safety features.

Unmatched Safety. Delivered.

360° Perception

Arbe's 360° Perception relies on data sharing between multiple radars, decreasing latencies while increasing confidence levels and accuracy of the tracking and the free space map. Multiple radars overlap in the fringes, tracking objects of interest smoothly from one radar to the next and validating the location of the same object through two different perception algorithms. The result is reduced false alarms, higher resilience to occlusion scenarios, and the ability to better foresee the quickly evolving vehicle environment.

Object Orientation

Object orientation is critical for countless actions, including safe and successful lane changes, navigation in intersections and roundabouts, and maneuvering through parking lots. For example, the sensor system must both see a truck in the lane and understand exactly where that truck is headed at zero/minimal latency within the dynamically changing road scene. Arbe's Perception achieves a 1° spatial resolution and hundreds of separate detections per object, allowing credible inference for hundreds of objects at zero latency.

Free Space Mapping

Free Space Mapping is the basis for navigation, path planning, and obstacle avoidance and therefore paves the way to autonomous decision–making, and autonomous driving. These applications require a reliable estimate of the empty vs. occupied space in the vehicle's environment. Arbe's Perception satisfies key requirements for free space mapping, namely high spatial resolution in all dimensions regardless of lighting or weather conditions, at long range with high reliability. Further, its high doppler resolution allows it to distinguish efficiently between stationary and dynamic detections. Together these capabilities make imaging radar a mandatory sensor suite component to map free space in real–time.

Ego–Motion

An accurate estimate of a vehicle's own velocity, referred to as ego–velocity, is crucial for truly safe ADAS and, eventually, autonomous driving. While ego–velocity can be estimated using a variety of methods, only Arbe's Perception provides precision at zero connectivity scenarios. Based on its ability to distinguish between stationary objects and dynamic objects, and by exploiting its high resolution in all dimensions, Arbe's technology makes highly accurate, per–frame, continuous ego–velocity estimations that overcome problematic scenarios such as bridges, tunnels, traffic jams, and garages.

Object Tracking

Object tracking is the ability to determine an object's location in relation to the vehicle, to classify it, and to understand its speed, size, shape, altitude, and orientation. Sophisticated tracking empowers all advanced safety applications, building a more complete picture of what is happening on and near the road and enabling safer navigation. Thanks to significantly better spatial resolution, Arbe's radar–based perception complements cameras for object tracking due to its superior long range detection, direct measurement of distance and relative velocity, and recognition of connections between frames.

SLAM

All of these perception abilities, combined with the highly detailed 4D radar data and the ability to detect stationary objects, enable the radar to provide Simultaneous Localization and Mapping (SLAM). SLAM is the ability to map the vehicle's surroundings while simultaneously localizing it within that map as it is being continuously generated. Arbe's independent SLAM solution is designed to work both in conjunction with and independently of other sensors in the vehicle, providing both redundancy and full backup when other sensors fail.

Arbe (Nasdaq: ARBE), a global leader in Perception Radar Chipset Solutions, is spearheading a radar revolution, enabling truly safe driver–assist systems today while paving the way to full autonomous–driving. Arbe's imaging radar is 100 times more detailed than any other radar on the market and is a mandatory sensor for L2+ and higher autonomy. The company is empowering automakers, tier–1 suppliers, delivery robots, commercial and industrial vehicles, and a wide array of safety applications with advanced sensing and paradigm–changing perception. Arbe is based in Tel Aviv, Israel, and has offices in China, Germany and the United States.

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Award–Winning Radar Revolution. **Delivered.**