IEEE P3116 Working Group

Standard for Automotive Radars

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Four main pillars of IEEE P3116

1. Static performance metrics of the radar
2. Dynamic or scenario-dependent features of radars
3. Interference
4. Radar testing methods

More information at https://sagroups.ieee.org/3116/

Members of P3116

Static features of automotive radars

- Angle FoV (min and max angle)
- Min and max detectable range
- Min and max detectable speed
- Angle resolution (azimuth, elevation)
- Range resolution
- Speed resolution
- RCS dynamic range
- RCS resolution
- Probability of false alarm
- Probability of mis-detection
- Update rate
- Confidence level under blockage/outage

Dynamic or scenario-dependent features

- Max no. of detectable targets
- Capability to differentiate targets (with respect to its resolution)
- Capability to detect targets crossing the radar bore-sight (perpendicular scenarios)
- Capability to detect targets passing each other
- Tracking (target to track association)
- Conditions
  - Weather conditions
  - Sensor blockage detection/sensitivity/mitigation
  - Tunnel installations
  - Guardrails
  - Manhole metal cap
- On-road objects
- Vulnerable Road User (VRU) detection:
  - VRU definition
  - Capability to detect Micro-Doppler signatures

Interference

- Types of interference:
  - Interference from ego-vehicle radars
  - Interference from radars on other vehicles
  - Interference from other sources, e.g. E-band communication, 5G, 6G etc.
- Performance requirements in presence of interference
- Evaluation of interference mitigation methods

Radar testing methods

- Testing using reference targets
- Testing with radar target simulators (RTS)
- Minimum requirements for virtual testing systems to qualify for testing this standard
- Hardware-In-the-Loop (HIL) requirements for dynamic testing
- Real-time requirements for test systems
- Verification of testing method
- Calibration of test system
- Test environment conditions, e.g. chamber
- Testing requirement at different stages of radar life-cycle:
- Lab testing
- Factory testing
- After-market