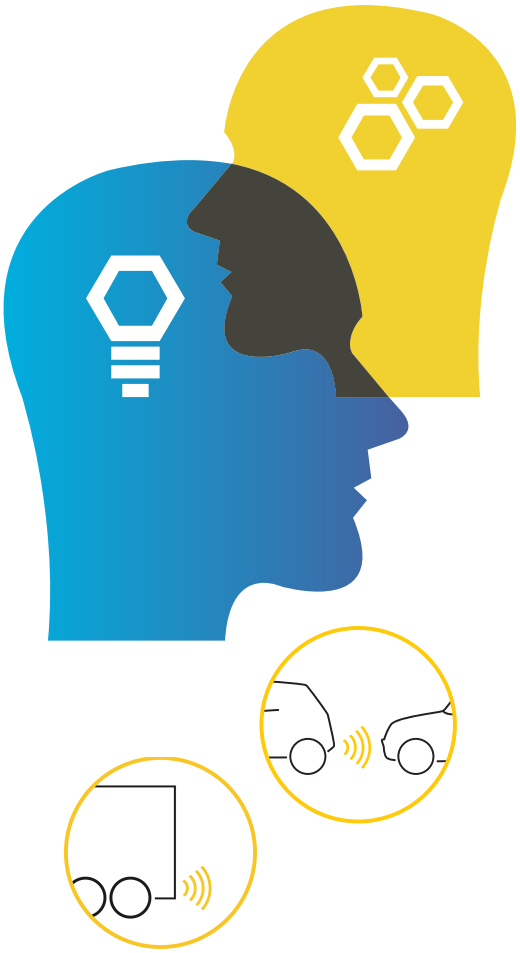
# ASGARD1

# Automated Signature Generator for Automotive Radar verification



## Key features

- Test solution based on real hardware/vehicle in the loop (HIL/VIL) setup,
- Reproducible test scenarios and access to ground truth,
- Specification of test scenarios through a GUI,
- Pre-recorded data base including signatures of thousands of radar targets and scenarios for automotive testing,
- Combining multiple of existing scenarios for creation of new test scenarios,
- Verification of multi-beam automotive radars,
- 24 GHz or 77 GHz RF front-end including a sub-system for obtaining radar signal parameters and antenna beam information.

> “ASGARD1 is a unique radar test and verification solution which provides in-lab facility to evaluate radar sensors, driver assistance systems and autonomous driving for their performance, availability and reliability.”

## Applications

**VERIFYING SAFETY STANDARDS**

Customised test suites e.g.

- AEB (EuroNCAP)
- ACC (ISO 15622)
- FCW (ISO 15623)
- Collision mitigation system (ISO 22839)

**END-OF-LINE TESTING**

- Evaluation of radar-based automotive safety functions in one package
- Validation of radar sensors
- Verification of autonomous vehicles

**INDIVIDUAL TEST SUITES**

Test scenarios for algorithm development for ADAS (Advanced Driver Assistance Systems) and AD (Autonomous Driving)

**CALIBRATION SYSTEM**

Adjustment of sensor Alignment

**RESEARCH AND DEVELOPMENT**

- Data generation for training of DNNs in automotive applications
- Micro-motion signature generation for target identification applications

SIGNAL PROCESSING | RADAR VERIFICATION | RADAR CALIBRATION | TARGET CLASSIFICATION

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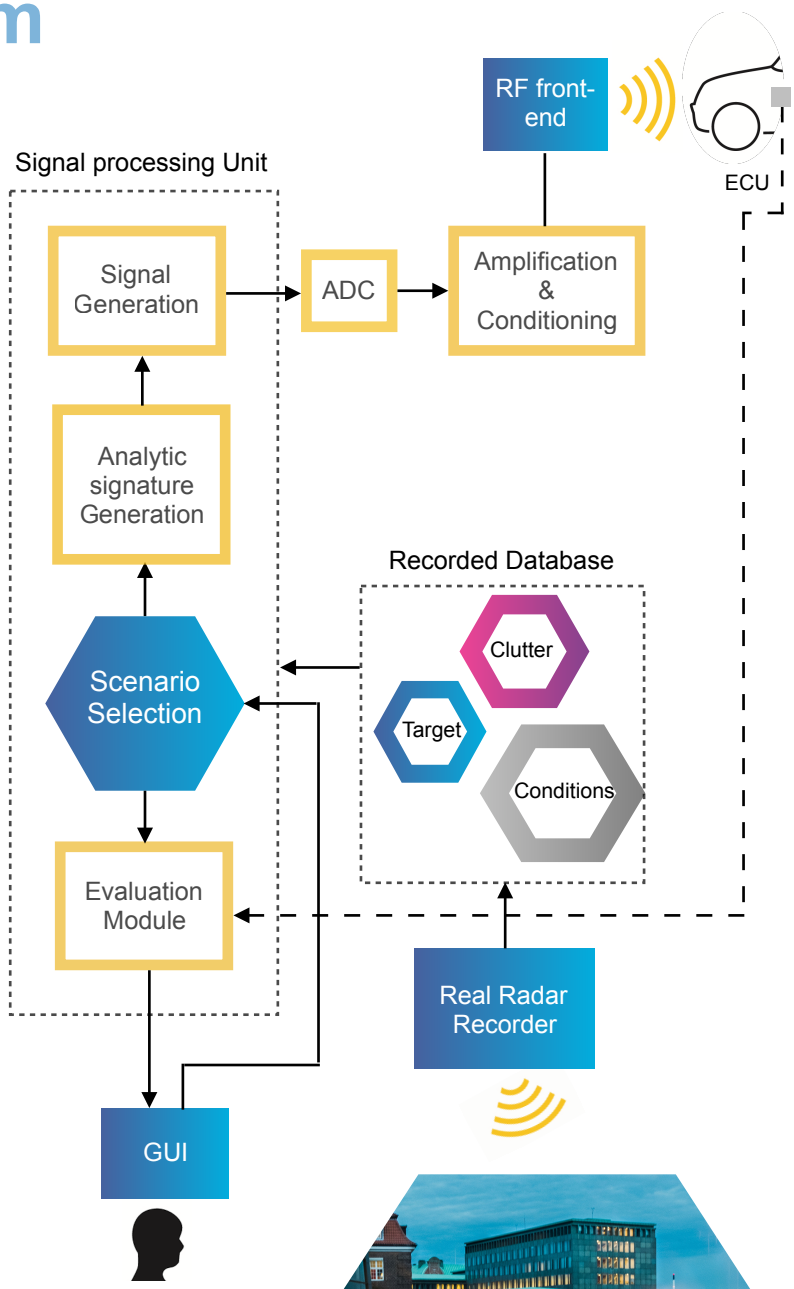
# Description and **Block diagram**

ASGARD1 is based on a patented technology and consists of an analytic signature generator, a data base of recorded signatures and an RF front-end. The user of the system can set different elements of test scenarios through a GUI.
Scenarios can be set in details by specifying:

- Number and types of vehicles, pedestrians and other road users,
- Road and traffic situations,
- Environment elements, e.g. rail guards, tress, …
- Weather conditions.




### TESTING SETUP

ASGARD1 sits in front of the vehicle or radar under test and emulates electromagnetic emissions analogous to real-scenario radar reflections. Due to the HIL/VIL setup, scenario signature updates in response to VUT in order to simulate experience of driving expeditions more realistically.

### MAJOR ADVANTAGES

Signature generation in ASGARD1 is done either through analytical method or using a pre-recorded data base or both. This does not only cover a large number of test scenarios but also makes it possible to add more test scenarios through combination of existing data.
This technology aims to replace long hours of driving expeditions with in-lab testing and adds the opportunity of repeating same test scenarios multiple times for radar, which is a definite need for development of radar-based systems and their reliability assessment.



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