

VALIDATION OF TEST INFRASTRUCTURE III: PERCEPTION TESTS ON A COBOT HiL

Cobot-HiL from Valeo for automated perception tests with a demonstration of data recording with Valeo's far-field lidar sensor Scala® Gen. 1.

Gerhard Schunk, Peerayut Khongsab, Xiaofeng Zhang, Georg Puhlfürst,
Valeo Schalter und Sensoren GmbH

Valeo develops a Hardware-in-the-Loop (HiL) based on a collaborative robot (cobot) for automated perception tests of Valeo's mobility kit sensors including fisheye cameras, near- and far-field lidar sensors, and ultrasonic sensors. Mechanical safety features support the safety of the involved engineers.



Cobot-HiL with the currently available sensors from Valeo's mobility kit: <https://www.valeo.com/en/valeo-mobility-kit/>.

The respective sensor is mounted on the last joint, i.e., the wrist, of the cobot. The cobot HiL can be used for the recording of high quality data, which is the basis for developing and testing the performance of the sensor's HW and SW. The cobot HiL can be used for reproducible tests over a large parameter space including different...

- ...mounting heights,
- ...angles of incidence,
- ...types of asphalt concrete,
- ...samples of lidar sensors.

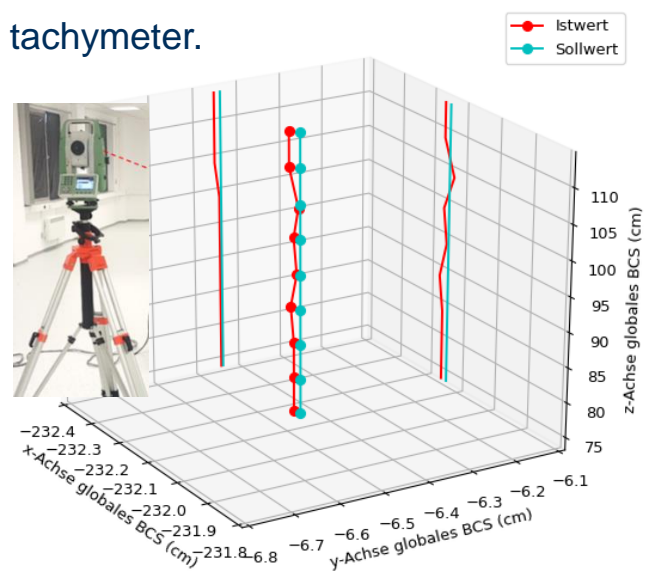
The cobot's range of 85 cm is sufficient to emulate all typical sensor mounting

www.vvm-projekt.de Twitter @vvm-project LinkedIn VVM Project

Projektpartner

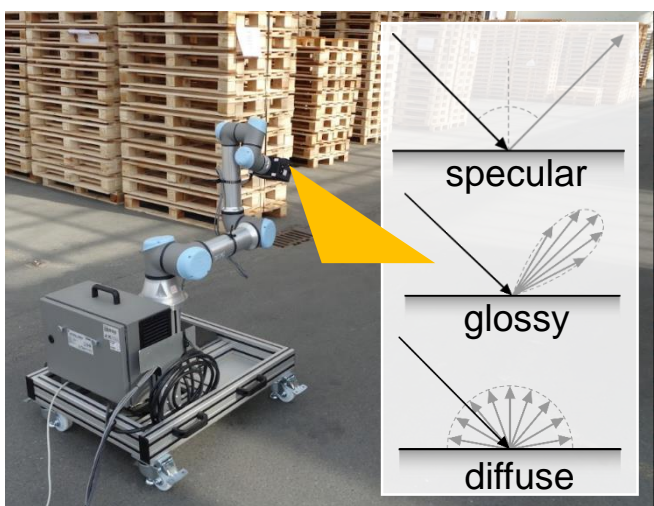


positions in the front of a passenger car. The position and orientation of the sensor in a global coordinate system is provided by a highly accurate tachymeter.



Accuracy tests of the robot with a trajectory in z-direction.

The measured standard deviation in z-direction (5 cm steps) is 0.18 mm. For the validation of the lidar simulation in VVM, the cobot HiL is used to collect reference data with the Scala® Gen. 1.



Recording of reference data for validating the lidar simulation based on the bidirectional reflectance distribution function (BRDF).

Finally, we compare the measured and simulated echo-pulse-widths (~optical power) using the different metrics such as the "Area Validation Metrics".