

**Equipment:**

ZESS provides on a floor space of about 1.500 square meters (office and laboratory space) modern equipment for the three main research topics.



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*Sensor Information Processing*

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Research in the field of sensor information processing are supported by setups for high performance sensor data simulation, collection and handling. Most of it is to study signal processing techniques for efficiently acquiring and reconstructing data by finding solutions to underdetermined linear systems (compressed sensing):

- Mono- and binocular RGB-D sensors
- AMCW and pulse-based ToF cameras (also to study various sensor effects such as multi-path, motion artefacts etc.)
- THz cameras
- Thermal infrared cameras
- optical infrared stereo cameras for 3D-Posetracking
- Long-range ToF imaging system mounted on a rotary table
- Turning roll test bench for axisymmetric symmetrical components

In addition there are measurement setups for:

- Real-time data recording of new sensor systems (mainly camera modules/image sensors with different interfaces)
- sensor fusion and 3D scene reconstruction (also on mobile devices)
- Imaging with Synthetic Aperture Radar Imaging
- Radar Detection and Tracking

And spectroscopy setups:

- Chemiluminescence/emission-sensor system based on a spectrometer and a back-illuminated CCD camera
- Raman-sensor system based on a cw Nd:YAG laser
- Various CARS-systems based on pulsed pico/nanosecond a Nd:YAG laser and a broadband dye laser

And Sensor Network test platforms (IMU, pressure, temperature, magnetic, light detection sensors, power balancing electronic etc.):

- Embedded vision nodes (2D/3D, multi-modal sensor nodes)
- Autonomous mobile systems (indoor/outdoor, air and ground robots)

Several in-house workstations and high performance compute-servers are used for simulations and verification of algorithms.