

IPS

Integrated Positioning System



Brief description

IPS is a **multi-sensor concept** for real-time self-location and 3D mapping in unknown indoor and outdoor environments where external location infrastructure such as GNSS or Wi-Fi are unavailable or restricted.

The model for IPS is the human sense of orientation. Visual and balance senses are replicated using a stereo camera and an Inertial Measurement Unit (IMU), and the sensor data are combined. The process is extremely **robust** in the face of interference and thus provides **reliable information about position and location** in space in real time. The computed depth maps created using the IPS stereo camera data are used to generate spatially referenced point clouds of almost any size, which can serve as the basis for subsequent **3D modelling**.

Other sensors (for example an HD camera) can be integrated as required. Their data are spatially and temporally referenced by IPS. This is very useful for a wide variety of **visual inspection and documentation tasks**. IPS is constantly being developed to optimise its functionality and performance. The Institute is conducting research and development work for this purpose in cooperation with industrial partners. The current **mobile handheld** unit is **small, light** and ideal for areas that are difficult to access.

Facts and figures

- Self-location and guidance for measurement tasks
- Robust, reliable and accurate basic technology
- Creation of 3D point clouds and basis for 3D modelling
- Visual inspection with spatially and temporally referenced data
- Digital documentation
- Suitable for indoor and outdoor use
- Proven application in the documentation of maritime facilities, mining industry, technical infrastructure and forest inventory
- Awards: Berlin Brandenburg Innovation Prize 2018

Applications and prospects

- Industry 4.0
- General navigational use
- Inspection of industrial plants and mines
- Use in mining, ship inspection, construction and infrastructure projects, forestry and seismic surveying
- Spaceflight

Parties involved

DLR Institute of Optical Sensor Systems, Berlin

