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Interactive visualization of robotic devices and the data provided by them in an augmented reality environment

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Our paper deals with designing and implementing methods for interactive visualization of dynamic spatial data using augmented reality (AR/XR). The data include the work zones of the robots and other information about the environment, e.g. lidar ranges and physical fields are also planned. Visualization takes place using AR headsets Microsoft HoloLens 2. These headsets are equipped with our in-house software modules that allow users to view data and manipulate objects in real-time. The data can of course be both measured and calculated dynamically.

As part of our development, we create suitable tools for spatial data visualization in AR/XR, including their integration and extension for the industry. In this area, the design and implementation of methods for effective data transfer between AR (respectively headset) and real devices. It is necessary to consider different formats, sources, and data characteristics (size, resolution, time dependence, uncertainty...) Applications also include voice and gesture control.

An important part of the development is also the design of suitable ergonomics applications in AR, where standardized solutions and standards have not yet been established, as is the case with the development of common 2D applications.

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