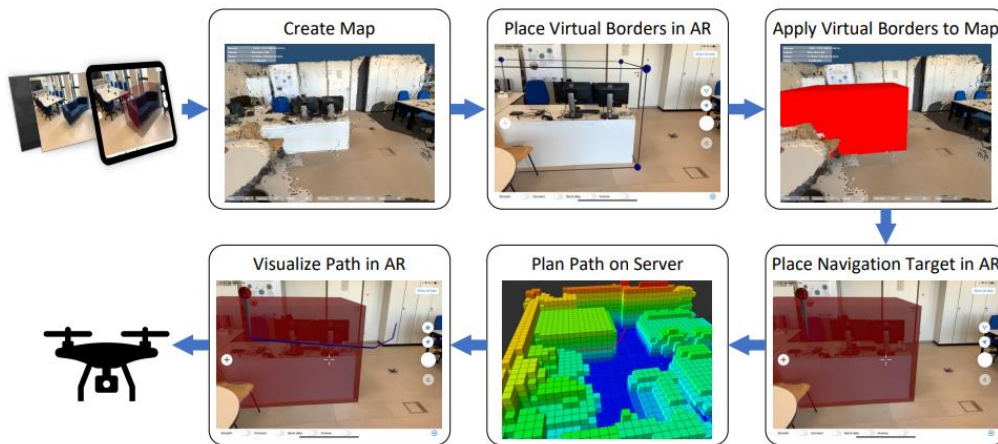


Virtual spatial boundaries for robots

3D working area entry with augmented reality

Invention

Safety first: Robots must not hurt people, and objects must be protected from collisions. So robots must know the working area in which they can move safely.



Procedure for placing virtual boundaries

Help is coming in this area in the form of an invention from the Bielefeld University of Applied Sciences and Arts: software that establishes and identifies virtual boundaries for autonomous robots. It is based on an augmented reality environment that uses RGB-D data, a format that links a camera image of the environment with spatial depth information. Sensors are already built into many mobile devices, such as smartphones and tablets. The key to this technology is that the working area boundaries are monitored in three dimensions, so a volume that the robot may not enter can be stipulated.

Commercial Opportunities

Since people and autonomous assistance systems increasingly share environments, such delimiting capabilities will become more and more important. A fast-growing market potential for such software-based autonomous robot control systems is forecast – both for private applications (house and garden) and for industrial use such as manufacture and storage.

Current Status

Initial prototypes have been manufactured, measured, and tested. System function and operation are shown in an illustrative video. Registration with the German Patent and Trade Mark Office and other subsequent international applications can be made in the priority year. We are offering interested companies the opportunity to license and refine the technology in collaboration with the inventors and the Bielefeld University of Applied Sciences and Arts.

Relevant Publications

1. Assisted Localization of MAVs for Navigation in Indoor Environments Using Fiducial Markers; Andre Kirsch, Malte Riechmann; Matthias Koenig
2. Augmented Reality for Interactive Path Planning in 3D; Malte Riechmann, Andre Kirsch, Matthias Koenig

An invention of the Bielefeld University of Applied Sciences and Arts.

Competitive Advantages

- Simple detection of 3D spatial boundaries
- Software-based solution
- Six degrees of freedom

Technology Readiness Level

123456789

Experimental proof of concept

Industries

- Electrical engineering
- Sensors
- Robotics

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