

The IUB 2002 Rescue Robot Team

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Extended Abstract

The first research goal of the IUB Team is on the systems engineering side to develop robust and versatile robots that are nevertheless rather inexpensive. The low cost factor should allow us to use larger groups of robots in scenarios with a high risk of losing individual systems. Second, semi-autonomy is investigated to allow a safe and efficient integration of tele-operation and various autonomous behaviors on board of the robots. The IUB rescue robot team is also used for education, as it is a regular part of the undergraduate program in Electrical Engineering and Computer Science (EECS) at IUB.

The implementation of the rescue robots is based on the so-called CubeSystem, a kind of construction kit for robotic systems. The center of the CubeSystem is the so-called RoboCube controller hardware [BKW00,BKW98]. For the challenging locomotion tasks that are needed for rescue robots, a mobile base was developed that features six actively driven wheels.

The IUB rescue robots are connected via standard networking technology, especially RF-ethernet, to their cockpit(s) from where they can be tele-operated. Due to the limitations of wireless connections and the complexity of rescue operations, the full operation of a robot can not be constantly supervised by a human operator, i.e., the robots have to be semi-autonomous. So, the commands by the human operator that are high-level and maybe already outdated due to a broken RF-link have to be supplemented by various autonomous behaviors on board of the robots. A detailed description of the software architecture that achieves this can be found in this volume [BK02].

References

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