

Augmented sensor data for mobile remote experimentation

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To establish mobile learning environments we have adapted Web-based remote laboratories to mobile devices like PDAs and smart phones. Our on-line lab experiment is a remotely controlled Pioneer 3 AT mobile robot [1].

A platform independent approach to realize web-based user interfaces on mobile devices is the use of asynchronous Javascript. With asynchronous Javascript an application behavior like Java applets or interactive Flash movies can be implemented. In combination with the exchange of XML based messages between client and server, these techniques are well known under the term 'AJAX'. Windows Mobile does not support an AJAX framework directly, but asynchronous HTTP requests are possible in Javascript.

The new asynchronous web client works on each Windows Mobile device without any additional software. Opera Mobile on Symbian OS, the new Google smart phone OS Android [2] and Apples iPhone are supported as well, only the video streaming solution have to be adapted for these platforms.

To overcome restrictions dealing with limited screen sizes, sensor data like position information and a moving map have been augmented in real time into the video stream to save limited place (320x240 pixels) for the GUI.

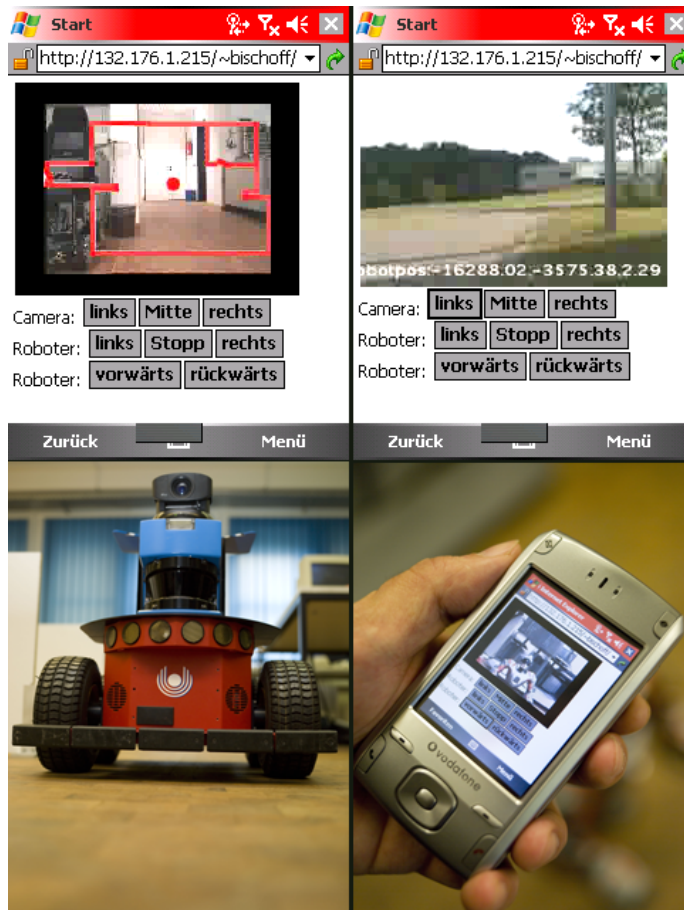


Figure 1: Windows Mobile 5 augmented asynchronous Javascript client 240x320 pixel

[1] Andreas Bischoff. M-learning, mobile experimentation and telepresence with cell phones and pdas. In Reinhard Langmann Michael E. Auer, Editor, International Conference on Remote Engineering and Virtual Instrumentation, REV2008, Duesseldorf, Germany, June 2008. Kassel University Press.

[2] <http://www.android.com>