1 Large Display Interaction Using Mobile Devices

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Large Displays are quite common in collaborative environments nowadays, due to the price drop in the last couple of years in display technology. Furthermore, with the advent of tiled displays, these kinds of displays are no longer an exclusive domain of high-end Computer Aided Design (CAD) / Computer Aided Modeling (CAM) users, e.g., in the automotive industry. In most cases Large Displays are controlled using the traditional desktop input devices, i.e. computer mouse and keyboard. While this approach is simple and straightforward, it does not scale very well to the number of users. That is especially true in the collaborative environments large displays are meant to be used. Since Large Displays offer a huge amount of screen real estate, their most common uses are to display very large datasets and/or to allow for a large number of people to use the display simultaneously. As the traditional devices of mouse and keyboard need a stable mount to be employed properly it might not always be possible to have enough room to offer these for a large number of people. It certainly is possible to provide all users with traditional or specialized input devices. A solution where each person already has their personal input device is obviously the most cost- and space-efficient. Smart phones are very popular and most people own one. The capabilities of those devices include touch screens, WiFi and 3G connectivity, gravitation sensors, GPS and more, which makes smart phones sophisticated input devices. Ballagas et al.[1] already came to the conclusion, that smart phones can be used in a number of scenarios. They are probably able to replace traditional input methods in collaborative environments for the reasons already stated. Tablets, such as the popular iPad, feature similar characteristics as smart phones packed into a larger form factor. As part of the ongoing BMBF ViERforES(Virtuelle und Erweiterte Realität für höchste Sicherheit und Zuverlässigkeit von Eingebetteten Systemen, Virtual and Augmented Reality for Highest Safety and Reliability of Embedded

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[1] Ballagas, Rafael and Borchers, Jan and Rohs, Michael and Sheridan, Jennifer G: The Smart Phone: A Ubiquitous Input Device in IEEE Pervasive Computing, Vol. 5, No. 1. (January 2006), pp. 70-77, doi:10.1109/MPRV.2006.18

Systems)-project new interaction metaphors have to be developed for usage with large 3D displays. First steps into this direction include a user study to test the general capabilities of smart phones for large display interaction (which showed promising results) and the introduction of a gesture-based eyes-free selection interface on mobile devices.