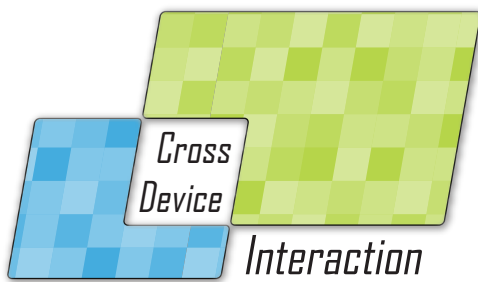
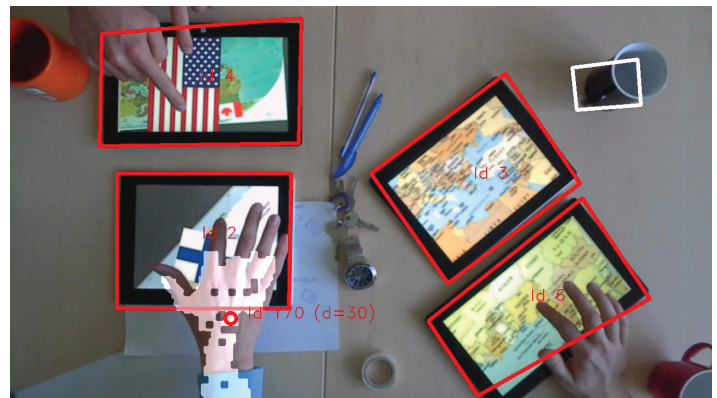


Cross-Device Interaction

Enabling technologies for multi-device environments



In recent years, the number of mobile devices has increased significantly. Along with this explosive growth, advancements in computing technology and the miniaturization makes them small, mobile, personal (super-) computers that we can carry with us. We envision a future where mobile devices can contribute their (interaction) resources to a community of devices in their proximity. At any time, users can dynamically compose a seamless multi-device user interface (UI) and reconfigure this UI according to their current needs and the task at hand. In this vision, users also can seamlessly add or remove devices from the community without explicit setup or pairing. Instead, this happens implicitly as a byproduct of natural use. Ideally, users will experience these co-located cooperating devices and reconfigurable displays as one seamless and natural user interface for ad-hoc co-located collaboration.



Device- and Hand-Tracking with HuddleLamp



Distributed Application based on Connichiwa

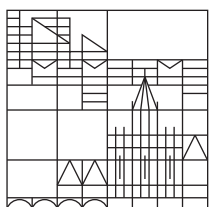
Projects

HuddleLamp

HuddleLamp is a desk lamp with an integrated low-cost RGB-D camera that detects and identifies mobile displays (e.g., smartphones or tablets) on tables and tracks their positions and orientations with sub-centimeter precision. Users can add or remove off-the-shelf, web-enabled devices in an ad-hoc fashion without prior installation of custom hardware (e.g., radio modules, IR markers) or software. Because of HuddleLamp's web-based pairing, adding a new device is simply done by opening a URL on the device and putting it on the table so that it is visible to the camera. This enables a new kind of computer-supported around-the-table collaboration. Users can sit around ordinary tables that can remain cluttered with non-digital objects (e.g., printouts, maps, notebooks) while their digital collaborations happen using spatially-aware mobile screens.

Connichiwa

Connichiwa is a web-based framework for creating cross device applications without the need for external sensing hardware or server infrastructure. Connichiwa abstracts away complex multi-device setup and pairing, works across different hardware platforms and architectures, and integrates full-stack web-technologies for cross device applications and communication. Beyond that, it runs a local web server on one of the participating devices, which makes external network infrastructure or an internet connection obsolete. As a framework designed to build truly self-sustaining cross-device applications, Connichiwa is compelling for many improvised activities (e.g., ad hoc meetings, outdoor scenarios, crisis management).



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