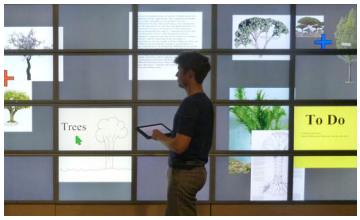
Intangible Tablet for Remote Interaction with Wall-sized Displays

Caroline Appert
caroline.appert@universite-paris-saclay.fr

Internship period: start March 1st or April 1st (5-to-6 months)
Supervisors: Caroline Appert (in collaboration with members from the ILDA team)
Research team: ILDA, Inria (building 660)



a)

b)

c)

Interacting with a Wall-sized display with a) a personal device held in the non-dominant hand [Chapuis *et al.*], b) a personal device worn as a smartwatch [Von Zadow *et al.*], c) an *intangible* tablet (artist rendering of a hypothetical solution)

Wall-sized displays immerse users in large high-resolution information spaces. They are well adapted to data analysis and collaboration, thanks to physical navigation that affords a natural type of pan-and-zoom in the information space [Ball *et al.*] and an enlarged physical space that enables collaborative work [Andrews *et al.*]. Interacting with such displays raises many challenges though, in particular because users need to be able to interact both close to the surface (typically touching the display) and far from it (typically using mid-air gestures [Nancel *et al.*] or a remote controller such as a tablet device [Chapuis *et al.*]).

Existing solutions have drawbacks though. On the one hand, mid-air gestures are difficult to discover, learn and might not be expressive enough to trigger a large range of commands. They are also difficult to implement robustly as they typically collide with everyday hand movements. On the other hand, using a tablet as a remote controller overcomes these issues as the tablet can accommodate usual widgets and supports multi-touch input, but it is at the cost of having their hands occupied. In this internship, we want to explore an alternative solution that consists of displaying a "tablet device" but in Augmented Reality. Such an *intangible* tablet would float over the user's non-dominant hand. The user can then interact with it using her dominant hand as she would do with a physical tablet but without having to carry a physical weight. The problem with virtual elements that float in the air is the lack of haptic feedback when interacting with them. In this specific case, we want to take advantage of the non-dominant hand to compensate for this.

The goal of this internship is to study this concept of *intangible* tablet. The intern will work on its interaction design (how to invoke it, how to control its position, how to let users reposition their non-dominant hand, etc.), its technical realization and on its evaluation in comparison with a regular tablet that is held in the non-dominant hand or attached to the non-dominant arm (in the spirit of projects like [Horak *et al.*, Von Zadow *et al.*]).

The work during this internship will consist of:

- literature review of remote interaction with wall displays;
- interaction design and prototyping;
- comparative evaluation in the form of a laboratory study.

Bibliography

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