

# Urban HCI: PlazaPuck

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## An unowned, moveable, public interface

### Introduction

Urban HCI research explores new interactive possibilities in the built environment. These interactions pose various challenges such as creating new interfaces for the public setting, and developing content to suit the medium.<sup>1</sup>

The PlazaPuck project is an attempt to explore public interaction in plaza situations. The device is movable unlike most public interfaces and provides a multi-access interface for performers, participants and spectators.<sup>2</sup>

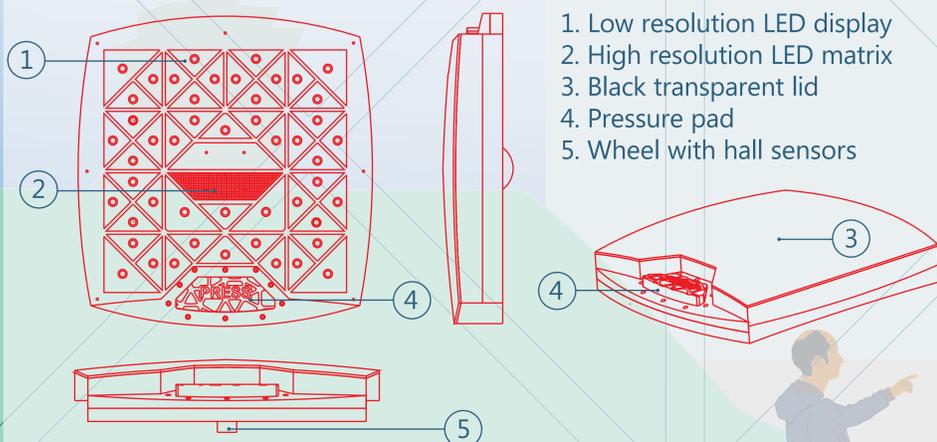
Main challenges for public interfaces are robustness, immediacy, cost and the subtle integration into the environment.

### The Interface

The PlazaPuck device is used as a research vehicle to explore different space types inherently present on public plazas, such as: "interaction spaces", "potential interaction spaces", "comfort spaces", "activation spaces", "gap spaces", "social interaction spaces", "display spaces".<sup>3</sup>

The physical design comprises a wheel so it can be easily turned and moved around the plaza. It is predominantly operated with user's feet through orientation, distance and stepping on. It contains a 2.4 GHz transceiver, microcontroller, tilt-compensated compass, pressure sensor, hall sensors, LED display matrix and a multicolour strip of LED's.

It is uniquely addressable allowing the project to be scaled up to a network of multiple PlazaPuck interfaces, increasing the overall access of the interface. The system also offers access by mobile phones.



### Intended Use Cases

Relative distance and absolute orientation are the main modes to interact and also tie the interfaces in relation to its surroundings.

This is done through storing a map in the host application. Users can e.g. be prompted to face the interface in the direction of a specific location on the plaza. Then by applying force to the pressure foot pad the application could prompt how many other people 'select' this architectural element.

The interface also aims to encourage social interaction within the proxemic social space, but also in the proxemic public space.<sup>4</sup>

E.g. for the latter a common question could be prompted onto all PlazaPuck interfaces meaning that all user's responses should be similar; creating a public performance and enhancing the 'performers display'<sup>3</sup> and spectator's experience.<sup>5</sup>

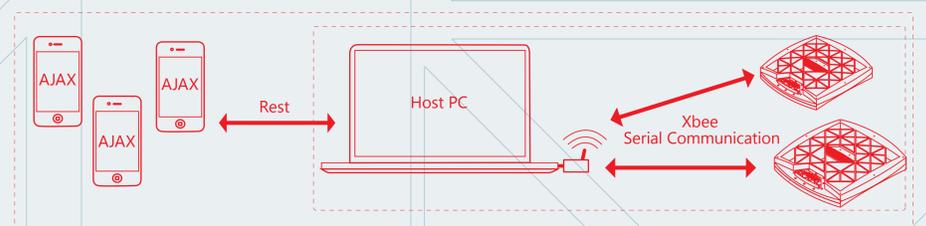
New use cases are expected to arise during the further development and when the device is put into its working environment.

### Design Aims

Based on prior experience with public interfaces, we found that 'moveable interfaces' the least inhibit the formation of a 'social space':

- Attention can switch quickly without losing control.
- The interface accommodates the user's movements.
- Bystanders can easily see what is happening.
- Participants can intervene in multiple ways.

A second reason for creating a moveable interface is that this allows us to explore different spaces in the city without heavy equipment. Thus, we might be able to get an understanding of what interactions could work 'better' in certain contexts and environments than others.



The system also considers explicitly the presence of spectators that feel only comfortable with watching the use of the PlazaPuck. They can influence the running application from 'back-stage' using their mobile phones.

Our main design aim is to promote values that enrich our public space through active engagement: moving through, communicating, play, discovery; and passive engagement: observing, viewing, involvement.

### Preliminary Findings

During the first field tests an un-owned nature of the interface could not be achieved and a 'gap space' between us (with the host PC) and the PlazaPuck was created. Surprisingly the space around the PlazaPuck was less affected. People also walked by and even over it.

Some people altered their original way to inspect the PlazaPuck.

Transmitting full sensor data to the PC host should be avoided and a more event-based approach should be adopted. For rich display data, such as the light gestures, an animation buffer is needed. Also information about finished animations and scrolled text is needed in order to be able to orchestrate the interaction flow better remotely.

### Future Work

Further system designs would involve an attempt to using a "Network of things" approach that integrates sensors and actuators directly through transceivers. This reduces the growing complexity when more sensors and actuators are added to a system. We also expect faster prototyping through a modular approach.

A test use case will be decided upon that will be put into the wild. It will be tested in different urban settings, in order to evaluate influences induced by architectural features.

REFERENCES:  
[1] DALSGAARD, P. AND HALSKOV, K. DESIGNING URBAN MEDIA FAÇADES: CASES AND CHALLENGES.  
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[3] FISCHER, P.T. AND HORNECKER, E. URBAN HCI: SPATIAL ASPECTS IN THE DESIGN OF SHARED ENCOUNTERS FOR MEDIA FAÇADES.  
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[5] REEVES, S. ET AL. DESIGNING THE SPECTATOR EXPERIENCE.

