

# Leveraging Physical Human Actions in Large Interaction Spaces

## Motivation

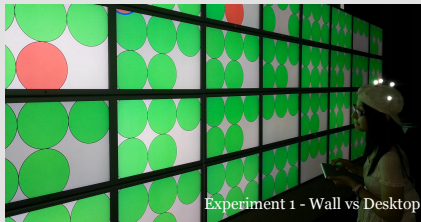
High-resolution wall-sized displays show massive amounts of data at once. Users can navigate the data by physically moving in front of it.

Organizers of CHI'13 scheduled talks into sessions on a wall display. Observation of this process motivated two controlled experiments to study the interaction with such displays for data manipulation tasks.

- What are the benefits of a wall-sized display?
- How do we design better interaction techniques to support group work?



## Benefits of Wall Display for Single and Multiple Users

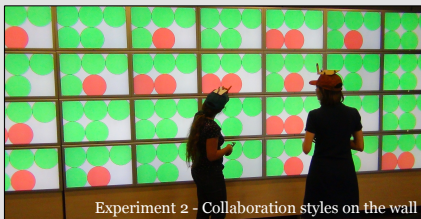
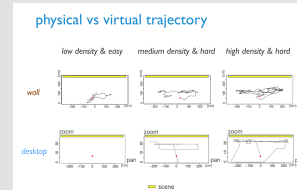
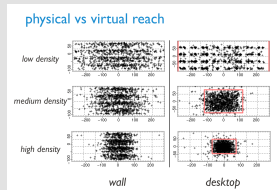
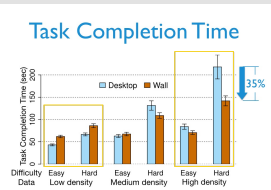


### Experiment 1 - data manipulation

- compares a wall display against a desktop screen
- abstract classification task
- operationalizes data density and task difficulty

### Results show:

- wall is 35% faster with dense data and hard tasks
- benefits come from using physical movements and positions to navigate the data (see details in [1])



### Experiment 2 - efficiency of collaboration styles

- operationalizes collaboration styles with different levels of coupling
- abstract task with quantitative measures
- compares collaboration with and without communication or interaction support

The findings suggest that close collaboration can benefit from augmenting verbal and gestural communication between users with interaction techniques.

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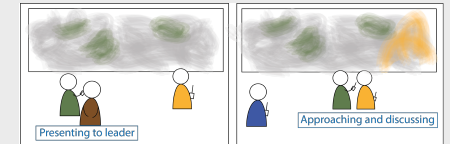
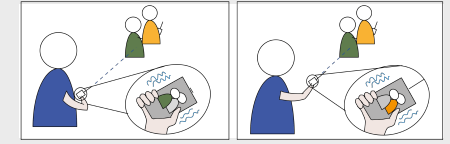
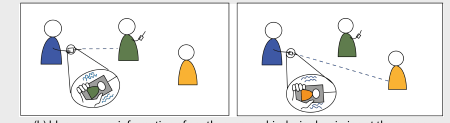
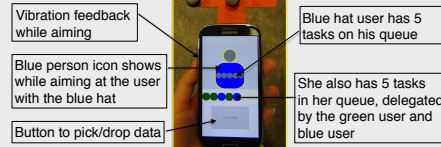
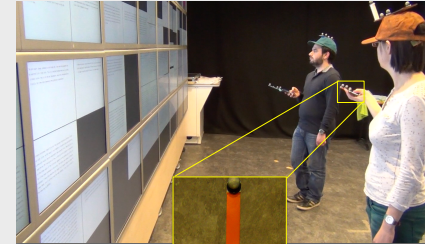
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Doctoral Symposium

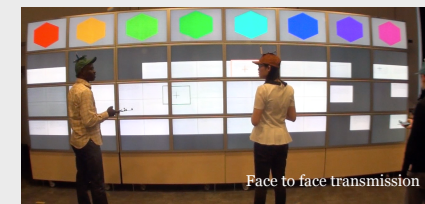


## Techniques to Augment Gestural Interaction Between Users



### PoPe - Point to People

- Interaction technique for multiple users to exchange data and delegate tasks in collocated collaboration environments
- One user can pick a data item on the wall display with a pointer device. The item can then be sent to another user by clicking a button while aiming at them.
- The item directly transmits to the receiver's cursor if it is idle, otherwise is stored in a queue to be retrieved later.
- Face-to-face communication while transmitting the data will highlight the received items in the queue for easy retrieval.



## Summary

My dissertation will contribute to the field in two main areas.

The fundamental research investigates the benefits of wall displays for data manipulation in both individual and collaborative context.

The interaction techniques will explore the design space of augmenting human-to-human interaction to support fluid information exchange.

## Reference

1. Liu C., Chapuis O., Beaudouin-Lafon M., Lecolinet E., and Mackay W. E. Effects of display size and navigation type on a classification task. *CHI '14*, ACM (2014), 4147–4156.