Interaction with Large Public Displays using Phonecams

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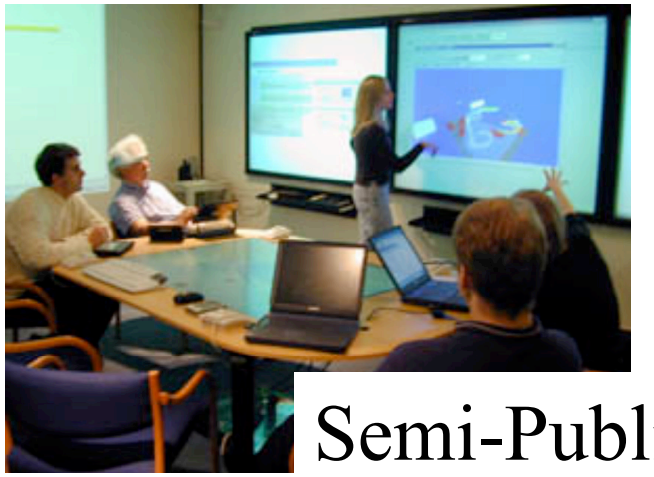
Overview

- Introduction / Motivation
  - **Large Public Displays**
  - **Phones vs. Other Interaction Techniques**
- New Phonecam Interaction Techniques
  - **Sweep**
  - **Point & Shoot**
- Future Directions
  - **Potential Improvements**
  - **Deployment Opportunities**
- Demo

Interaction with Large Displays

Personal



Semi-Public

Public

Potential Applications

Large Public Displays

- Games
- Interactive art
- Digital bulletin boards
- Advertising

Direct surface interaction

- Clear affordance
- One-to-one mapping
- High Serendipity

But…

- Physical Security
- Scalability
- Perspective
- Sanitation / Maintanence
- Multi-user

Mobile Phones

- Inherent Multi-user support (1 device / person)
- Physical Security not an issue
- User familiarity
- Connectivity standards
- Many built-in sensors / actuators

Mobile Phones for Pointing Tasks

Two Camera-based Techniques

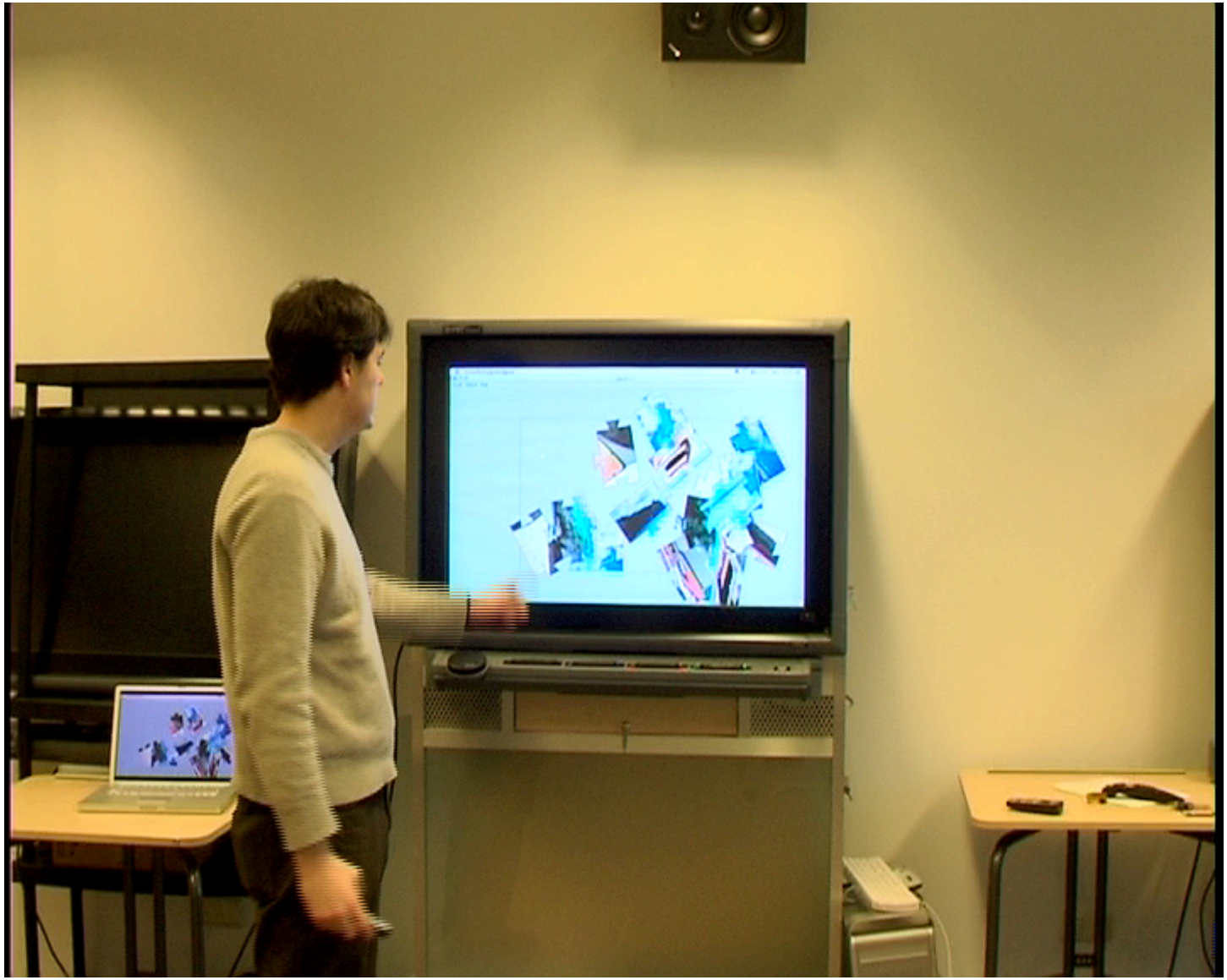
- Sweep
- Point & Shoot

Sweep

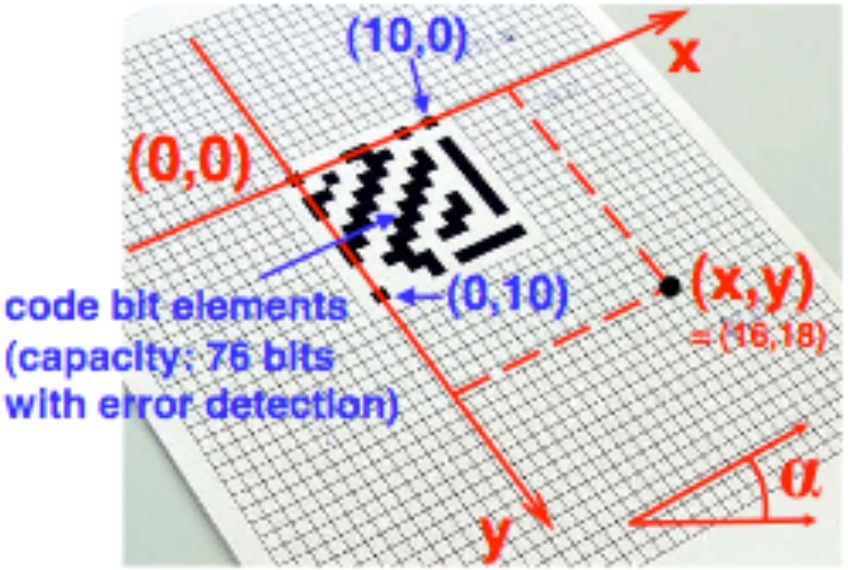
- Optical Flow Technique
  - **Allows the phone to be used like an optical mouse**
- The joystick is used as a clutch
  - **Allows user to reposition arm**
- User can focus attention on the large display

Point and Shoot

- Aim using cross-hair cursor on phone screen
- Take a picture
- Item that you selected through the camera lens becomes selected on the large display.

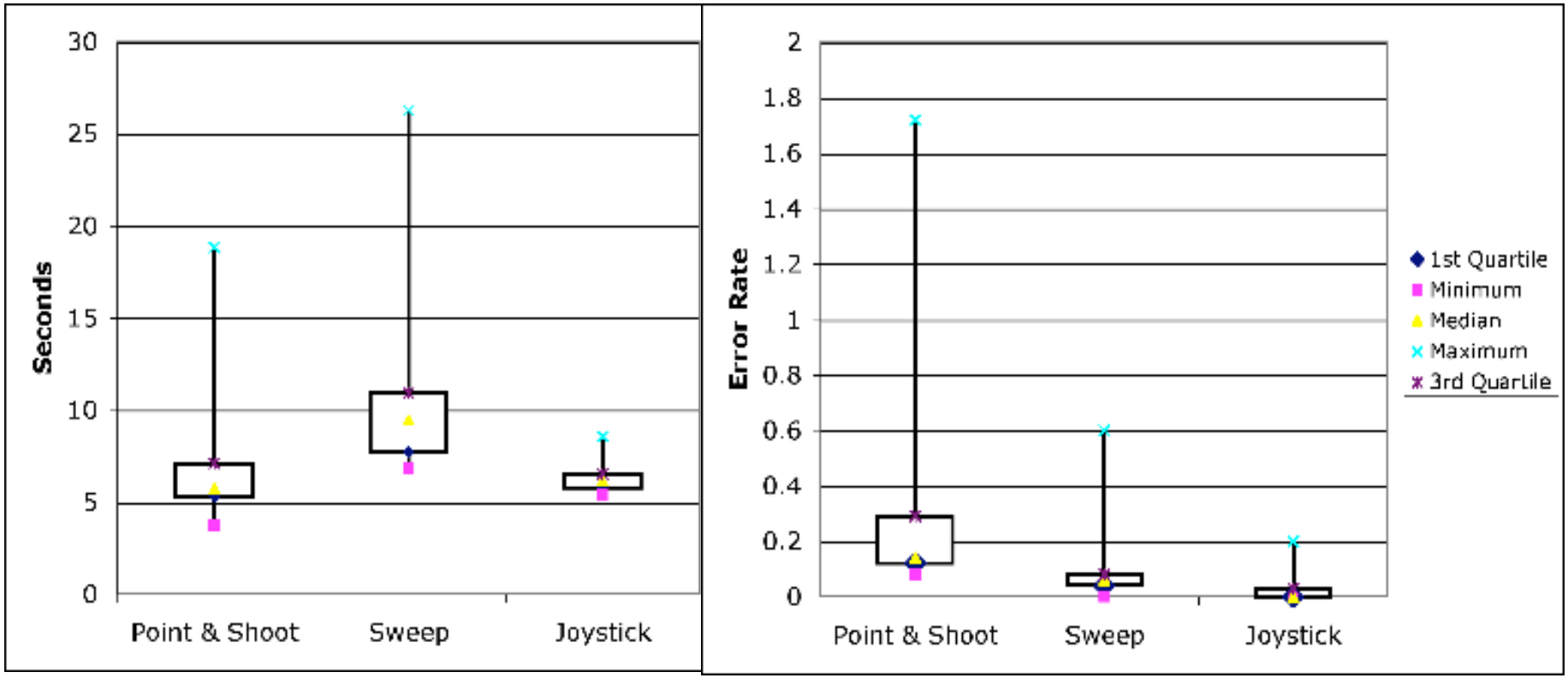


Visual Codes

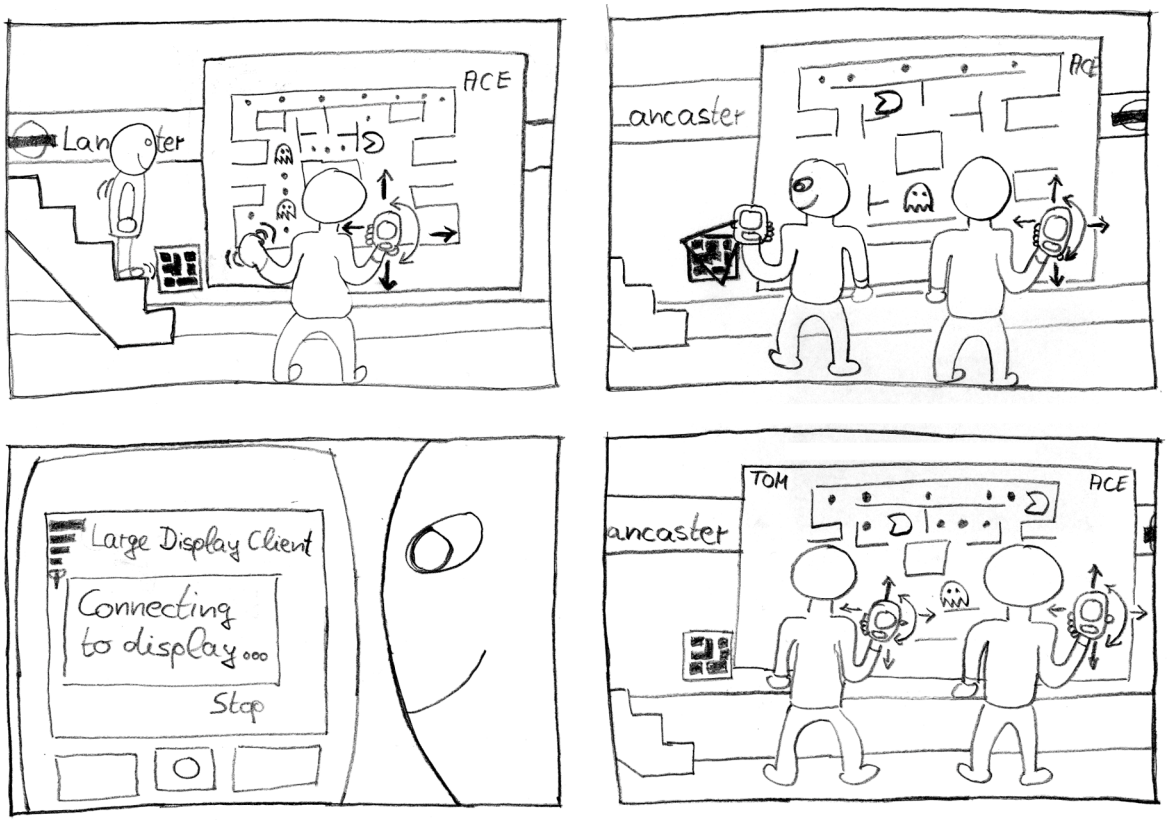


- Arbitrary
  - **Orientation**
  - **Tilt**
  - **Rotation**
- In Point & Shoot they are used to derive coordinate system on the display surface.
- Currently 83 bits

Performance Evaluation



Example Scenario



Deployment Opportunities

- eCampus
- REXplorer