iCapture: Facilitating Spontaneous User-Interaction with Pervasive Displays using Smart Devices

Keith Mitchell
Nicholas J.P. Race
Michael Suggitt

Presentation Overview

- Lancaster eCampus Initiative
- Background and Motivation
- iCapture Use Application
- Initial Evaluation
- Future Work

eCampus Overview

- Lancaster eCampus Initiative
  - £500,000+ capital funded project
  - Pervasive display deployment
    - Focus is on public spaces
      - Not offices or meeting room or lecture halls
    - Open to all University members
      - Research and production services
    - Concurrent/Parallel research activities
      - Underpass project
      - Networked displays for facilitating coordination & community
      - Awareness and Interaction

eCampus: Infrastructure

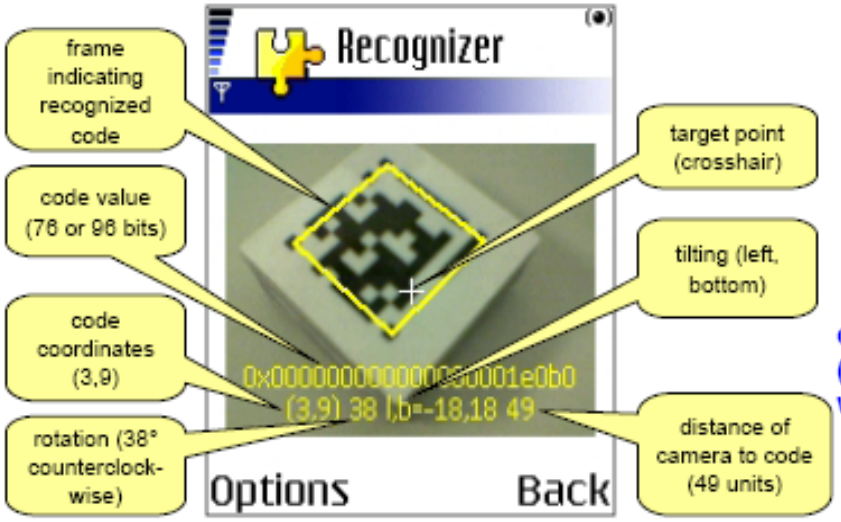
- Multiple Display Technologies
- Sensors
- Cameras

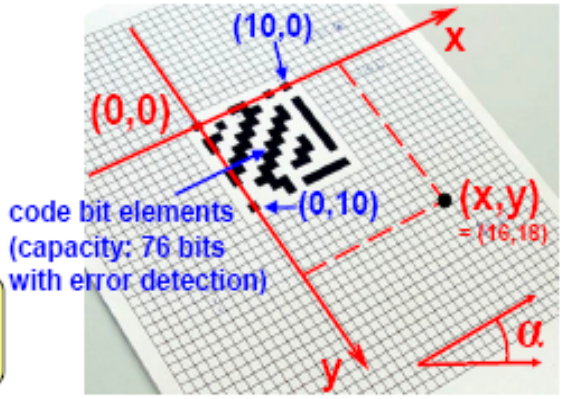
iCapture Overview

- *Investigate how one can mediate spontaneous user interaction with the pervasive*
  - *Via camera equipped mobile phones*
  - *Use the camera as the contextual trigger for information retrieval*
    - Simple and intuitive
    - Exploit visual codes

Visual Codes

- 2D bar-codes
  - Recognition via VGA Camera-Phones
- Visual code acts as an identifier
- Recogniser application on handset
  - Able to computes orientation and distance





iCapture Overview

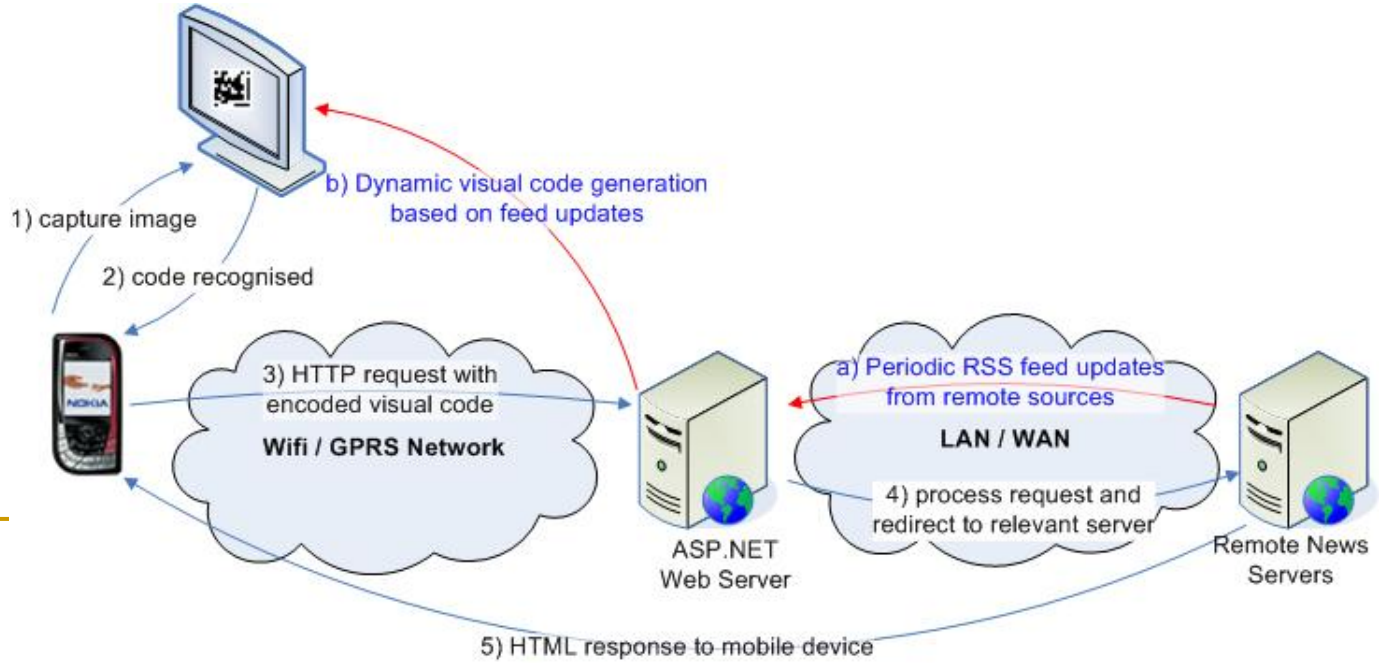
- Prototype visual code application
  - MSC Project demonstrator
- Supports user-interaction with large public display
  - Plasma displays
- Large displays contain news headlines, article summary and code

iCapture Operation

- Codes dynamically generated
  - Based on URL of article

iCapture Architecture

- ASP.NET server back-end
  - Creates feeds, codes
- Standard Windows Form UI
- Symbian based code recogniser



iCapture: Initial Evaluation

- Simple Scenario
  - Capture news on way to lecture
  - 15 seconds initially
  - 8 seconds for subsequent requsts
- Experimented with Large Underpass projected display
  - Scaling Issue when project 3m x 3m!
  - Poor lighting conditions
  - Hard to detect glyphs, and ….
  - … user has to stand in middle of road!

iCapture: Future Work

- Currently porting to .NET Framework
  - Download Now Vs Bookmark for later
    - Improve performance
  - Test with WM5 devices to test video functionality
    - Exploit integrated wi-fi to trigger video streaming
    - Further large (projector) screen deployment
  - Large Vs Small
    - Display content on personal device or large display?
      - Investigate public/private information