Using Pen-based (Sonically-enhanced) Gestures to Maximise PDA Screen Space

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Introduction

• The Palm V screen is small
  - 160×160 pixels
  - 2% of the area of a 1280×1024 desktop screen
  - 10% or more is used by buttons
• Q: Can we get rid of the buttons?
Alternative to buttons?

• **Gestures**
  – Stylus strokes interpreted by computer
  – Palm’s Graffiti is a gesture system, though not a whole-screen system

• Use whole-screen gestures instead of buttons?
  – Instead of a "Confirm" button have a "Confirm" gesture

• Cinema listing application built to test the idea
The gesture set

(a) Confirm
(b) Cancel
(c) Previous
(d) Next

(e) Showing
(f) Book
(g) F/slash
(h) B\slash
Problems?

- No visual cues as to available actions
- Memorability of the gestures
- Recognition algorithms not always reliable enough for all users
A solution

- Use audio cues to inform user of available actions
- 3 groups of gestures
  - Navigation group: "Next" and "Previous"
  - Decision group: "Confirm" and "Cancel"
  - Cinema-specific group: "Showing" and "Book"
  - (F/slash & B/slash not sonified)
- Earcons for three groups
  - Single, double, and triple tones respectively
Evaluation

• Four modes of operation
  - With buttons
  - With gestures &
    - With sonically-enhanced gestures
  - With sonically-enhanced gestures and permanent screen prompts
Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Identify two pieces of information for a selected cinema.</td>
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<tr>
<td>2</td>
<td>Identify two pieces of information for a selected film.</td>
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<tr>
<td>3</td>
<td>Place and confirm a booking for a selected film.</td>
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<tr>
<td>4</td>
<td>Place and cancel a booking for a selected film.</td>
</tr>
<tr>
<td>5</td>
<td>Place and confirm a booking for a selected film, but before confirming the booking, make an electronic payment.</td>
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<tr>
<td>6</td>
<td>Place and confirm a booking for a selected film, but before confirming the booking, cancel an attempted electronic payment.</td>
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<tr>
<td>7</td>
<td>Place and cancel a booking for a selected film, but before cancelling the booking, make an electronic payment.</td>
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</tbody>
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User responses

• **Buttons Mode:**
  - "Easy to use but had to stop myself trying to use gestures … buttons mode felt cumbersome", "Easy, but tried to use gestures first"

• **Earcons difficult remember and to recognize**
  - More a function of poor earcon design and the Palm’s audio engine

• **Gestures modes required fewer stylus presses**

• **Familiarity led to decreased dependence on backslash and auditory cues**
Next

• Look at platform with better sound
• Improve earcon design
• Extend earcons to give feedback during use
• Apply to desktop environments?
  – e.g. Wacom graphics tablets
Questions