Computer Interaction for Older Adults

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Outline

• Introduction
  – older adults and computer mouse use

• Background
  – Fitts’ law and implications for improving performance

• Two studies
  – 1. Expanding targets  2. Proxy targets

• Conclusions and further work
Introduction
Introduction

Compared with younger people, older adults have greater difficulties using a computer mouse

- take longer to make movements
- have more difficulties getting the cursor onto a target and keeping it steady
Fitts’ law

For a “point and click” task:

\[ MT = a + b \times ID \]

\[ ID = \log_2 \left( \frac{D}{W} + 1 \right) \]
Fitts' Law

- "Easy" (faster)
- "Hard" (slower)
Fitts’ law

Suggests two ways to reduce times,

- increase $W$ – bigger targets

**Study 1: Expanding Targets**

- decrease $D$ – shorter distances

**Study 2: Proxy Targets**
[Baudisch et al, 2003; Bezerianos and Balakrishnan, 2005]
Study 1:
Expanding Targets
ISO 9241, Ergonomic requirements for office work with visual display terminals (VDTs) — part 9, requirements for non-keyboard input devices.
Study 1: Expanding Targets

10 older

“regular” and expanding, over a range of difficulties

10 younger

“regular” and expanding, over a range of difficulties
Study 1: Expanding Targets

- Older adults took nearly twice as long as the younger adults
- Overall, times were approx 200ms ~ 13% faster with expanding targets
Study 2: Proxy Targets

Proxy target
Study 2: Proxy Targets

11 older

“regular” and proxy, over a range of difficulties

11 younger

“regular” and proxy, over a range of difficulties
Study 2: Proxy Targets

257ms = 12% slower

No effect
Conclusions

For older adults

- Expanding targets - 13% time reduction
- Proxy targets - 12% time increase
- Both methods are intuitive
- Analysis of error rates and subjective feedback gives a more complete picture
Further work

• How should these methods be implemented for multiple targets?

• How well will these methods work for multiple targets?
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