

Improving command selection with CommandMaps

Joey Scarr, Andy Cockburn, Carl Gutwin, and Andrea Bunt. CHI 2012.

Designers of GUI applications typically arrange commands in hierarchical structures, such as menus, due to screen space limitations. However, hierarchical organisations are known to slow down expert users. This paper proposes the use of spatial memory in combination with hierarchy flattening as a means of improving GUI performance. We demonstrate these concepts through the design of a command selection interface, called CommandMaps, and analyse its theoretical performance characteristics. We then describe two studies evaluating CommandMaps against menus and Microsoft's Ribbon interface for both novice and experienced users. Results show that for novice users, there is no significant performance difference between CommandMaps and traditional interfaces -- but for experienced users, CommandMaps are significantly faster than both menus and the Ribbon.

Three Approaches to HCI Research



Empirical science

- Descriptive research
- Relational research
- Experimental research



Ethnography



Engineering and design

- Compelling target
- Technical challenge
- Deployed when possible

Seven Research Contribution Types in HCI

- Empirical
- Artifact
- Methodological
- Theoretical
- Dataset
- Survey
- Opinion

(1) IllumiRoom: peripheral projected illusions for interactive experiences

Brett R. Jones, Hrvoje Benko, Eyal Ofek, and Andrew D. Wilson. CHI 2013

IllumiRoom is a proof-of-concept system that augments the area surrounding a television with projected visualizations to enhance traditional gaming experiences. We investigate how projected visualizations in the periphery can negate, include, or augment the existing physical environment and complement the content displayed on the television screen. Peripheral projected illusions can change the appearance of the room, induce apparent motion, extend the field of view, and enable entirely new physical gaming experiences. Our system is entirely self-calibrating and is designed to work in any room. We present a detailed exploration of the design space of peripheral projected illusions and we demonstrate ways to trigger and drive such illusions from gaming content. We also contribute specific feedback from two groups of target users (10 gamers and 15 game designers); providing insights for enhancing game experiences through peripheral projected illusions.

(2) Typing on flat glass: examining ten-finger expert typing patterns on touch surfaces

Leah Findlater, Jacob O. Wobbrock, and Daniel Wigdor, CHI 2011

Touch screen surfaces large enough for ten-finger input have become increasingly popular, yet typing on touch screens pales in comparison to physical keyboards. We examine typing patterns that emerge when expert users of physical keyboards touch-type on a flat surface. Our aim is to inform future designs of touch screen keyboards, with the ultimate goal of supporting touch-typing with limited tactile feedback. To study the issues inherent to flat-glass typing, we asked 20 expert typists to enter text under three conditions: (1) with no visual keyboard and no feedback on input errors, then (2) with and (3) without a visual keyboard, but with some feedback. We analyzed touch contact points and hand contours, looking at attributes such as natural finger positioning, the spread of hits among individual keys, and the pattern of non-finger touches. We also show that expert typists exhibit spatially consistent key press distributions within an individual, which provides evidence that eyes-free touch-typing may be possible on touch surfaces and points to the role of personalization in such a solution. We conclude with implications for design.

(3) Starcraft from the stands: understanding the game spectator

Gifford Cheung and Jeff Huang. CHI 2011

Video games are primarily designed for the players. However, video game spectating is also a popular activity, boosted by the rise of online video sites and major gaming tournaments. In this paper, we focus on the spectator, who is emerging as an important stakeholder in video games. Our study focuses on Starcraft, a popular real-time strategy game with millions of spectators and high level tournament play. We have collected over a hundred stories of the Starcraft spectator from online sources, aiming for as diverse a group as possible. We make three contributions using this data: i) we find nine personas in the data that tell us who the spectators are and why they spectate; ii) we strive to understand how different stakeholders, like commentators, players, crowds, and game designers, affect the spectator experience; and iii) we infer from the spectators' expressions what makes the game entertaining to watch, forming a theory of distinct types of information asymmetry that create suspense for the spectator. One design implication derived from these findings is that, rather than presenting as much information to the spectator as possible, it is more important for the stakeholders to be able to decide how and when they uncover that information.

(4) Dark Patterns in Proxemic Interactions: A Critical Perspective

Saul Greenberg, Sebastian Boring, Jo Vermeulen, Jakub Dostal. DIS 2014

Proxemics theory explains peoples' use of interpersonal distances to mediate their social interactions with others. Within Ubicomp, proxemic interaction researchers argue that people have a similar social understanding of their spatial relations with nearby digital devices, which can be exploited to better facilitate seamless and natural interactions. To do so, both people and devices are tracked to determine their spatial relationships. While interest in proxemic interactions has increased over the last few years, it also has a dark side: the knowledge of proxemics may (and likely will) be easily exploited to the detriment of the user. In this paper, we offer a critical perspective on proxemic interactions in the form of dark patterns (i.e., ways proxemic interactions can be misused). We discuss a series of these patterns and describe how they apply to these types of interactions. In addition, we identify several root problems that underlie these patterns and discuss potential solutions that could lower their harmfulness.

(5) A Versatile Dataset for Text Entry Evaluations Based on Genuine Mobile Emails

Keith Vertanen and Per Ola Kristensson. MobileHCI 2011

Mobile text entry methods are typically evaluated by having study participants copy phrases. However, currently there is no available phrase set that has been composed by mobile users. Instead researchers have resorted to using invented phrases that probably suffer from low external validity. Further, there is no available phrase set whose phrases have been verified to be memorable. In this paper we present a collection of mobile email sentences written by actual users on actual mobile devices. We obtained our sentences from emails written by Enron employees on their BlackBerry mobile devices. We provide empirical data on how easy the sentences were to remember and how quickly and accurately users could type these sentences on a full-sized keyboard. Using this empirical data, we construct a series of phrase sets we suggest for use in text entry evaluations.

(6) Complementing text entry evaluations with a composition task

Keith Vertanen and Per Ola Kristensson. TOCHI 2014

A common methodology for evaluating text entry methods is to ask participants to transcribe a predefined set of memorable sentences or phrases. In this article, we explore if we can complement the conventional transcription task with a more externally valid composition task. In a series of large-scale crowdsourced experiments, we found that participants could consistently and rapidly invent high quality and creative compositions with only modest reductions in entry rates. Based on our series of experiments, we provide a best-practice procedure for using composition tasks in text entry evaluations. This includes a judging protocol which can be performed either by the experimenters or by crowdsourced workers on a microtask market. We evaluated our composition task procedure using a text entry method unfamiliar to participants. Our empirical results show that the composition task can serve as a valid complementary text entry evaluation method.

- How? ←
- speed
 - accuracy
 - satisfaction
- task

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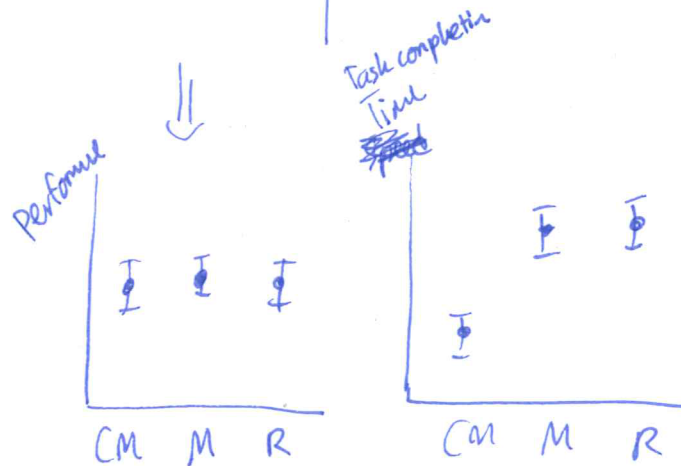
Domain overview

Designers of GUI applications typically arrange commands in hierarchical structures, such as menus, due to screen space limitations. However, hierarchical organisations are known to slow down expert users. This paper proposes the use of spatial memory in combination with hierarchy flattening as a means of improving GUI performance.

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□ What performance?

	novice	experienced
Command Maps		
Menu		
Ribbon		



□ How did the theoretical perf. derived?

Problem in the domain
proposed solution
(in principle)

evidence to support the proposed principle

What they did.

What they found.

comparison ⇒ experimental

artifact "model"

empirical