SketchingDIS: Hand-Drawn Sketching in HCI

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Abstract

Hand-drawn sketches can be an easy way for HCI researchers to communicate and express ideas, as well as to document, explore and communicate concepts between the researcher and user, collaborator, manager or client. These sketches are fast, lightweight, easy to create, and – by varying their fidelity – they can be used in all stages of the HCI research and design process. Here, we aim to explore themes around sketching in HCI with the aim of producing tangible outputs in the form of visual records, articles and papers that review and promote this technique in HCI as a field: 'SketchingDIS: Hand-drawn sketching in HCI' SketchingDIS.wordpress.com, a one-day workshop will bring together researchers from various disciplines that have incorporated hand-drawn sketching into their everyday research practice, to share knowledge and methodologies, generate ideas, practice collaborative sketching, and to discuss the future of hand-drawn sketching in HCI and DIS itself.

Author Keywords
Sketching, Drawing, Visual Thinking, HCI

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.
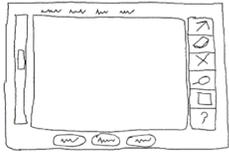
Figure 1: Low-fidelity hand generated sketch of a simple application created with SILK [8]
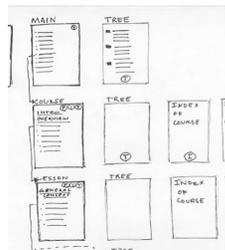
Figure 2: Part of a low-fidelity sketch of the overall structure of CAD software tutorial [7].
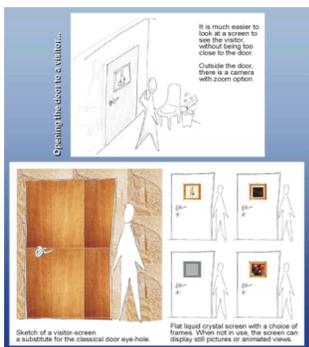
Figure 3: Hand-drawn sketches of door screens sketched by elderly users and researchers [17].

Background

The skill of drawing has been shown to develop along the same pathways as language [1]. As babies, our first forays into visual representations of the world around us are through picture books; as toddlers, we are encouraged to depict our world and our feelings using crayons, pencils and finger-paint on paper. Then – often to the dismay of our parents – we are often drawn to larger canvases such as furniture and walls. When we grow up however, we are introduced to verbal and textual communication and information and somehow forget or become 'blinded' to the value of pencil and/or pen-to-paper, sketches [2]: *"Out go their loose, easy sketches, and in come the supposedly "real" tools, the power tools of numbers and words that will likely dominate their attention for the rest of their lives"* [3].

Hand-drawn sketching is often viewed as challenging due to an inherent belief that visual thinking and production is something practiced when young and is hard to achieve as an adult – because drawing is difficult [2, 3, 4]. However, hand-drawn sketching can be learned at any age and is not an innate ability or extraordinary coordination [5]. Researchers often feel incapable of creating sketches, or resort to written scenarios as a fast option. However, pencil to paper, or stylus to digital tablet (e.g. iPad, Surface Pro or Cintiq Companion) can be an easy way for HCI researchers to communicate and express ideas and the road maps of how to get there [6]. Sketches are often used to document, explore and communicate concepts and ideas between the researcher and researcher, the user, collaborator, manager or client. For example: **User interface design:** Low fidelity hand-drawn sketches, e.g. storyboards, site maps and wireframes, are used in

the early stages of websites, applications and software design (figure 1) [7, 15]. **Interaction design and user experience design:** Low fidelity hand-drawn sketches (e.g. storyboards) and visual notations are used to explore possible solutions within a current conception of the problem. For example, how interaction sequences can inform use and context of a system over time (figure 2) [15]. **User-centered design:** Hand-drawn sketches are used to quickly and inexpensively to explore concepts. For examples, users' can be asked to step through a task using a sequence of paper prototypes. **Participatory design:** Low to medium-fidelity hand-drawn sketches is used to gather user requirements i.e. making communication tangible, contextualizing design concepts, and unveiling underlying thoughts. Sketches created by the users can facilitate design by providing resources for idea exploration and allowing for further interpretations (figure 3) [6, 8, 3, 9]. **Shape-Changing Interfaces:** User-generated sketches demonstrate ideas for the future of shape-changing interfaces (figure 4). Additionally, designers explore how to communicate shape-change in product sketches (figure 5). **Information security:** Low and medium-fidelity hand-drawn sketches are used to gather and understand user behaviors. The sketches created by the researchers and users depict a lived experience within organizations or when interacting with a digital service (figures 6 and 7). **Design fiction and speculative design:** High-fidelity hand-drawn sketches are used to depict fictional research worlds through which HCI researchers might consider future interactions (figure 8). **Reflective practice:** hand-drawn sketches are often used to depict the way individuals make sense of 'things' through and with their bodies, tools, artifacts and the surrounding environment [14, 16].

Figure 4: Non-expert participant generated sketch of idea for future use for shape-changing interface technology [18].
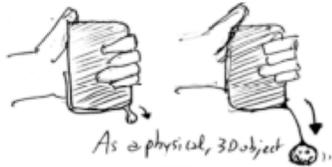
Figure 5. Designer's sketch of adding/subtracting in shape-change [19].
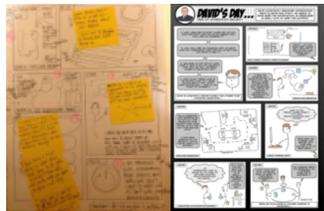
Figure 6: Current experience comic strip showing lived experience. Left: low-fidelity hand-drawn sketch. Right: medium-fidelity hand-drawn sketch using tablet/stylus [11].

Motivation

Hand-drawn sketches are lightweight and easy to create and by varying the fidelity of sketches they can be an integral part of all stages of HCI research and the design process [10]. Such flexibility makes them a valuable tool that can increase access; break down boundaries to concept expression; support the thinking process; and communicate ideas to others [12]. As such, hand-drawn sketching has trickled into HCI researcher's everyday practices – with a particular focus on the gathering or reflecting on user research data, designing of novel user experiences, [6, 8, 3, 7 & 9]. For example, Makayla Lewis and Lizzie Coles-Kemp. 2014b [11] created a visual artifact, current experience comic strip (Figure 7), based on interviews. The visual artifact depicted the everyday security behaviors of information security practitioners. The research discovered that low to medium-fidelity hand-drawn sketches could offer a way in which different professional roles can work together to share understanding of complex topics. Additionally, medium-fidelity hand-drawn sketches offer HCI researchers a way to reflect on, and participate with, user research data [11]. Whereas, Dixon, D, et. al. [5] developed a system for a computer to provide direction and feedback for assisting users to draw a human face as accurately as possible from an image; whilst Erkut and Rajala-Erkut, [13] used pen to paper sketches to explore embodied interaction for designing designedly knowledge.

Goals

SketchingDIS will bring together individuals from industry and academia that have an interest or have used hand-drawn sketching in HCI research. The workshop aims to: 1) Discuss the future of hand-drawn sketching, e.g. What is preventing hand-drawn sketching in HCI research from being more visible in the HCI community? What research does SketchingDIS community deems worthy of further investigation? 2) Exercise and discussion to explore the idea that hand-drawn sketching is not just about drawing, when HCI researchers sketch, they talk, they interact and they collaborate. Thus, we aim to answer: What is the significance, benefits and pitfalls of hand-drawn sketching in HCI? We will ask attendees to form groups to brainstorm ideas and then compare and contrast the results. 3) Develop a roadmap and agenda for greater engagement with sketching in the HCI community: brainstorm and document key barriers and issues (e.g. reproducibility), research directions, and training or education necessary. 4) Discuss how sketching is currently taught in HCI curricula and identify opportunities to increase its use for communication and its recognition as a key skill. 5) Produce an overview of the value of sketching at DIS and in the wider HCI community by drawing upon the visual and written abilities of the attendees, to be published in Interactions, or at a future conference. Attendees will also be encouraged to take their own style of visual notes during the sessions as a reflective tool.

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Figure 7: User' current experience comic strip depicting information sharing using tactile visual library & pen/paper [3].

Figure 8: Comic-strip created for Sturdee, M. et, al. [19].

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