Sketching in HCI: Hands-on Course of Sketching Techniques

Makayla M. Lewis, Brunel University London, United Kingdom, makayla.lewis@brunel.ac.uk
Miriam Sturdee, University of Calgary, Canada, miriam.sturdee@ucalgary.ca
Nicolai Marquardt, University College London, UK, n.marquardt@ucl.ac.uk

Freehand sketching is a valuable process, input, output, and tool, often used by people to communicate and express ideas, as well as document, explore and describe concepts between researcher, user, or client. Sketches are fast, easy to create, and – by varying their fidelity – can be used in all areas of HCI. Sketching in HCI will explore and demonstrate themes around sketching in HCI with the aim of producing tangible outputs. Attendees will leave the course with the confidence to engage actively with sketching on an everyday basis in their research practice.

INTRODUCTION

Freehand sketching is of great value as a process, input, output, and tool but is often limited to personal expression. It is in our roots: from ancient cave paintings to modern graffiti. We learn to use tools and make marks before we learn to speak, our visual language is universal, and may be as fundamental to development as language learning [4]. The traditional view of the "sketch" is that of a visual representation of an idea, a short, fast drawing on paper – although it has more meanings depending on context. It can be used across multiple disciplines and all levels of research. In HCI it can take on roles as diverse as a section of code [1] or rapid prototype [5], be recognized using algorithms [8], converted into digital representations [9], and even used as input [10].

DETAILED COURSE STRUCTURE

Course website: https://sketchhci.wordpress.com/

Duration of course: Three 80-minute sessions.

Audience: The content of this course is suitable for individuals from industry and academia that have an interest in learning and or improving their sketching skills. Novices, experts and those with an interest are welcome to attend.

Benefits: Often overlooked in many disciplines, or suggested as a 'soft' skill, sketching can support researchers to ideate [16], collaborate, document [6], and explore [11] complex themes and spaces. The popularity of sketching can be seen across disciplines and at all levels of HCI research, so we intend not only to celebrate and promote this diverse role of sketching to all practitioners, but also to generate discussion – encouraging participants to adopt sketching in their everyday research.

Prerequisites: No prerequisites.

Course content: Participants will be guided through selected sketching techniques and strategies (Fig. 1, 2, 3, 4, 5, 6)). These techniques will be based on well-established sketching, interaction design and computer science material, e.g. [7], but will also include additional techniques and examples. Participants will also be encouraged to bring an idea which they feel would benefit from a sketching

approach, in order to make a start on their own work and gain helpful feedback from the instructors and their peers. As a result of *CHI 2018 Applied Sketching in HCI* course [13] feedback, this course will consist of 8 parts and 14 hands-on activities:

Figure 1: Sketching in HCI workshop (top), Visual icon library *'18* (middle), and photo tracing at *CHI '18* (bottom)
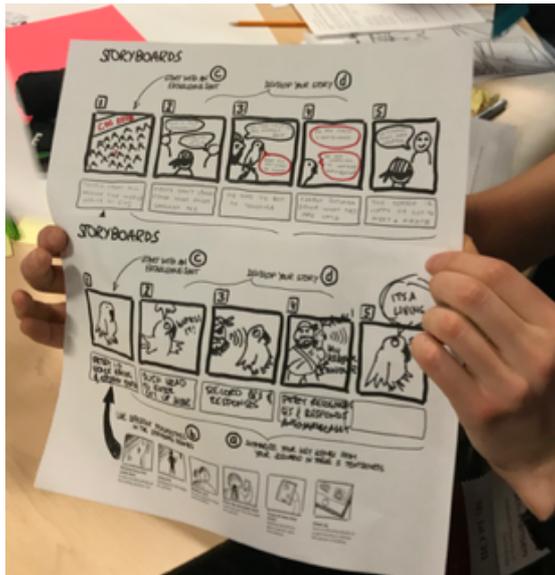
Figure 2: Participant's storyboard sketch at *CHI '18*

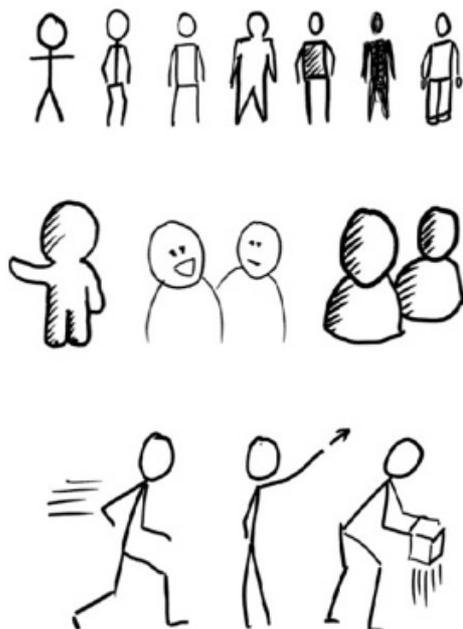Figure 3: Participant's storyboard sketch at *NordiCHI '16*

Figure 4: Sample sketching techniques covered in the course

Figure 5: Makayla Lewis live sketching at *CHI '18*

Figure 6: Participant's figure, gesture and action sketches at *CHI '18*

1. Warm up: *Activity #1*: Participants will be asked to embrace their 'younger selves' by mark making (scribbling). The purpose is to let go of perfection, and to create a safe and friendly environment for sketching.

2. Sketching in HCI: Presentation and discussion outlining visual thinking and sketching with examples from HCI, interaction design and computer science. *Activity #2*: Visual mind map exploring significance, benefits, and pitfalls of sketching in HCI.

3. Visual language: Participants will sketch-along with the instructors, following a series of best practice examples, that will be live drawn and digitally projected for immediacy. *Activity #3*: The humble line, connectors, and separators. *Activity #4*: People gestures and actions, place, and shading (Fig. 4, 6).

4. Objects: Participants will work together to rapidly build a visual dictionary of objects and concepts present in HCI. *Activity #5*: icon dictionary (Fig. 1, 10).

5. Typography & lettering: Participants will explore the role of annotations and notes in sketches (e.g. Fig. 7, 9). *Activity #6*: Hand-lettering with different pens using instructor examples (worksheets) + Show & Tell

Figure 7: Sketchnotes by Miriam Sturdee

6. *Photo tracing and hybrid sketches:* Participants will create a collection of outlines as sketches followed by clear examples of how this can be used in HCI. *Activity #7*: Photo tracing with black markers and transparent film (Fig. 1) + Show & Tell.

7. *Visual Storytelling:* Participants will use 'Storycubes' [18] to practice quick ideation, storytelling and sketching. *Activity #8*: Rapid story sketching. Next, they will be asked to theoretical prototype (peer generated) or storyboard a user experience. *Activity #9*: Storyboarding (Figs. 2, 3, 5). *Activity #10*: image-interviewing (Fig. 5).

8. *Reproducibility:* Examples of sketching in HCI, interaction design and computer science. *Activity #11*: Participants will work in groups to see if different types of sketches obtain different results. *Activity #12*: Participants will be given an HCI paper, asked to identify icons in its content then create an overarching sketch + Show & Tell attention will be placed on sketch variances.

9. *Application of new skills to relevant research topics*: Participants will utilize the skills from the initial stages of the course in the investigation of their own topic of interest. *activity #13*: (low level) Mapping out early-stage design iterations and ideas, or sketching problems/solutions. *activity #14*: (high level) Refining and annotating images to explore potential benefits, pitfalls, and implementation issues.

The instructors will ensure feedback is given to each participant during the course. The course will culminate in sharing of recommended tools, materials, books, teaching resources, e.g. methods to apply sketching in HCI for lectures/workshops - followed by group discussion around the skills learned, and give participants the opportunity to ask questions, exchange best practice, ideas, and make contacts for potential collaboration. Participants will also be invited to join our existing network, *'Sketching in HCI'*: engaging with sketching research and practice in HCI at http://bit.ly/2yiacMk [12].

COURSE HISTORY

Applied Sketching in HCI course [13] and a special interest group *Sketching in HCI* [12] has been previously given at *CHI 2018* by the authors. Similar courses and workshops have been provided by the authors at: *CHI 2017, DIS 2017, NordiCHI 2016, TReSSPASS Summer School 2016,* and *CHI 2015*.

One author delivers an MSc module in sketching in HCI. Another author has provided industry tuition at *UX Cambridge 2018, UX in the City: Manchester 2018, UX Oxford 2017, UX Scotland 2017, UX in the City: Oxford 2017, UX Leeds 2017, UX Bristol 2016, UCD 2015,* and *TCUK 2014*. The CHI 2019 course will have a greater focus on applying sketching on an everyday basis to researchers' own work and interests, an emphasis lacking in previous courses.

INSTRUCTOR BIOGRAPHY

Makayla Lewis is a Research Fellow in HCI and smart money at Brunel University London, she uses visual methods to explore human factors in private data management. Makayla is also an accomplished visual thinker and sketcher who organizes monthly sketching events and courses, and provides visuals and sketchnotes for international companies and conferences such as CHI and ISS. *Miriam Sturdee* is a Post-Doctoral Fellow at University of Calgary, investigating sketching and data visualization. She holds an MFA in Illustration, and is a member of *ReOpen*, the comics network at Lancaster University (http://wp.lancs.ac.uk/reopen/). *Nicolai Marquardt* is Associate Professor in Physical Computing at University College London. See Fig. 10.

INSTRUCTOR RESOURCES

Makayla Lewis www.makaylalewis.co.uk contains HCI sketchnotes, daily sketches and illustrations, and links to public engagement events e.g. http://SketchnoteHangout.com, SketchnoteLDN, sketching crib sheets and worksheets, and Adobe XD sketching feature. *Miriam Sturdee* co-authored our ACM Interactions magazine features 'Feeling SketCHI? The lasting appeal of the drawn image in HCI' [20] and 'The rise and rise of the Sketchnote' [19], the latter is also ACM featured blog. *Nicolai Marquardt* is well known for his collaboration on *Sketching User Experiences: The Workbook* (Morgan Kaufmann 2011, resources website at: https://sketchbook.cpsc.ucalgary.ca/). Other helpful resources include *The Back of the Napkin* [15] and *The Sketchnote Handbook* [16], *Doodle Revolution* [3], *Visual Notetaking for Educators* [14], and *Visual Thinking: Empowering People & Organizations through Visual Collaboration* [2] books, which offer a beginner's perspective on different sketching approaches. Course notes (e.g. Fig 4) will be produced before course and shared. Following the course, a visual summary 'sketchnotes' (e.g. Figs. 7, 9) and crib sheet (e.g. Fig. 8) will be produced and shared.
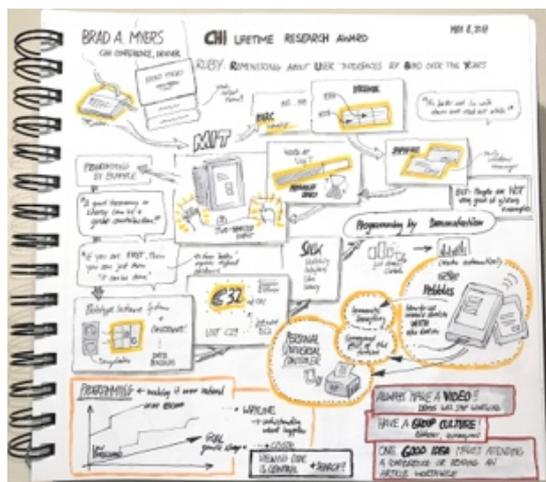

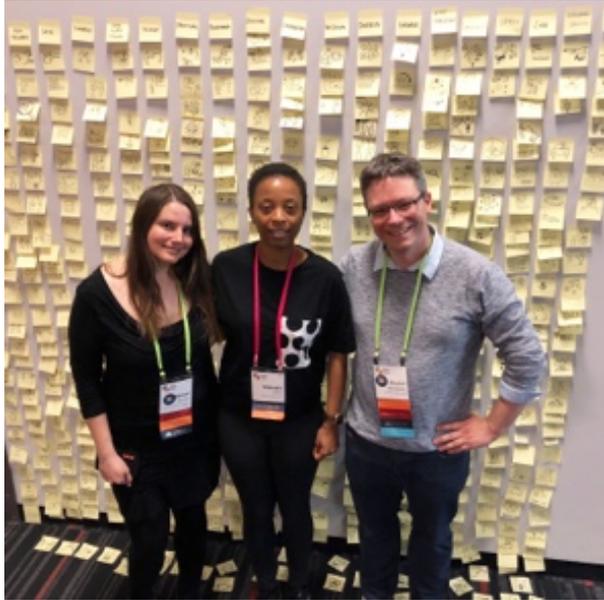Figure 9: Sketchnoting at *CHI '18* by Nic Marquardt

Figure 10: Instructors in front of visual icon library after *CHI '18* course.

REFERENCES

Ilias Bergström and Alan F. Blackwell. 2016. The practices of programming. In *Visual Languages and Human-Centric Computing (VL/HCC), 2016 IEEE Symposium on*, pp. 190-198.

Willemien Brand. 2017. Visual Thinking: Empowering People & Organizations Through Visual Collaboration. BIS.

Sunni Brown. 2015. The Doodle revolution: Unlock the power to think differently. Portfolio.

Neil Cohn. 2012. Explaining 'I can't draw': Parallels between the structure and development of language and drawing. *Human Development* 55, 4: 167-192.

Matthew Cottam and Katie Wray. 2009. Sketching tangible interfaces: Creating an electronic palette for the design community. *IEEE Computer Graphics and Applications* 29, no. 3.

Pauline Gourlet and Thierry Dassé. 2017. "Cairn: A Tangible Apparatus for Situated Data Collection, Visualization and Analysis." In *Proceedings of the 2017 Conference on Designing Interactive Systems*, pp. 247-258. ACM.

Saul Greenberg, Sheelagh Carpendale, Nicolai Marquardt, and Bill Buxton. 2011. *Sketching user experiences: The workbook*. Elsevier.

Tracy Hammond and Randall Davis. 2006. Tahuti: A geometrical sketch recognition system for uml class diagrams. In *ACM SIGGRAPH Courses*, p. 25. ACM.

Takeo Igarashi, Satoshi Matsuoka, and Hidehiko Tanaka. 2007. Teddy: a sketching interface for 3D freeform design. In *ACM SIGGRAPH Courses*, p. 21. ACM.

Gabe Johnson, Mark Gross, Ellen Yi-Luen Do, and Jason Hong. 2012. Sketch it, make it: sketching precise drawings for laser cutting. In *CHI'12 Extended Abstracts on Human Factors in Computing Systems*, 1079-1082. ACM.

Bongshin Lee, Rubaiat Habib Kazi, and Greg Smith. 2013. "SketchStory: Telling more engaging stories with data through freeform sketching." *IEEE Transactions on Visualization and Computer Graphics* 19, no. 12 (2013): 2416-2425.

Makayla Lewis, Miriam Sturdee, and Nicolai Marquardt. 2018. "SketCHI: Hands-On Special Interest Group on Sketching in HCI." *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM.

Makayla Lewis, Miriam Sturdee, and Nicolai Marquardt. 2018. "Applied Sketching in HCI: Hands-on Course of Sketching Techniques." *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM.

Wendi Pillars. 2015. Visual Note-taking for Educators: A Teacher's Guide to Student Creativity. WW Norton & Company. Dan Roam. 2013. The back of the napkin: Solving problems and selling ideas with pictures. Portfolio. Mike Rohde. 2013. The sketchnote handbook: the illustrated guide to visual note taking. Peachpit Press.

Stephen AR Scrivener and Sean M. Clark. 1994. Sketching in collaborative design. *Interacting with Virtual Environments*. *Wiley, UK*.

Rory's Storycubes. 2018. Retrieved 16 Oct. 2018 from https://www.storycubes.com/

Miriam Sturdee, Makayla Lewis, and Nicolai Marquardt. 2018. Feeling SketCHI?: the lasting appeal of the drawn image in HCI. *Interactions* 25, 6 (October 2018), 64-69.

Miriam Sturdee, Makayla Lewis, and Nicolai Marquardt. 2018. SketchBlog #1: the rise and rise of the sketchnote. *Interactions* 25, 6 (October 2018), 6-8.