Maker Movements, Do-It-Yourself Cultures and Participatory Design: Implications for HCI Research

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Abstract
Falling costs and the wider availability of computational components, platforms and ecosystems have enabled the expansion of maker movements and DIY cultures. This can be considered as a form of democratization of technology systems design, in alignment with the aims of Participatory Design approaches. However, this landscape is constantly evolving, and long-term implications for the HCI community are far from clear. The organizers of this one-day workshop invite participants to present their case studies, experiences and perspectives on the topic with the goal of increasing understanding within this area of research. The outcomes of the workshop will include the articulation of future research directions with the purpose of informing a research agenda, as well as the establishment of new collaborations and networks.

Author Keywords
Maker culture; DIY approaches; participatory design; social innovation; research in-the-wild; grassroots HCI.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Background and Questions

Participatory design has a long history of relevance to the HCI research community, due to a shared focus on the human in the system [12]. Participatory design originated as a movement grounded in supporting the rights of workers to participate in the development of the systems that directly affect them [4], and is now addressing widespread changes in access to, and engagement with, networked media and technologies. The shifts in this landscape, where vastly greater numbers of people can now obtain low cost, customisable computational components, is enabling the democratisation of innovation [3]. The age of "Do-It-Yourself" and "maker culture" may be opening out the design of computational technologies to more people, but what does this mean for HCI research? What implications does this work have for citizen and community empowerment? Does the foundational knowledge gained and described by HCI researchers still have relevance for this new generation who are exploring the world of interaction design at first hand?

Design Values and Social Innovation

Recent work on the design of information and communication technologies has raised and explored research questions around democracy, accountability and the values inherent in design against the backdrop of participatory culture [15]. For the HCI community in particular, research challenges are emerging around the development of methods and approaches to support user involvement and empowerment in the design process, such as the design of effective toolkits [9, 16] or new engagement frameworks [1, 13] and methodologies to support technology innovation at the grassroots level [18].

Objects, systems and processes

Previous work on participatory design has focused on the physicality of "things and objects", and on the involvement of participants and potential users in the product design process. However, there is also a movement towards identifying, designing and supporting social, technical and spatial infrastructures [5, 2, 14]. As opposed to the modernist framing of design as problem solver, the metaphor *infrastructure* designates the creation of possibilities, in and through which stakeholders can create their own solutions. Depending on the situation, these structures can denote virtually anything from tools, physical spaces, shared language, protocols and boundary objects [17].

Participation: from user to maker

The growth of the maker movement, and the wider availability of low cost technological components, has supported a wider participation in the hands-on activity of making objects. However, questions arise around the scale of impact that is possible within the essentially individually-oriented practice. Making is often carried out as an end in itself, for the fundamental, creative pleasure and direct engagement with materiality that the practice affords.

In the European context, research projects including *Making Sense* [8] and *MAZI* [10] are developing approaches to engage citizens in the design and development processes of interactive networked technologies. These projects are addressing challenges and questions around what participation means against the background of widely accessible design tools and technologies.

More broadly, researchers are turning their attention to addressing the implications of maker culture for HCI and this workshop aims to further explore current practices, methods and framings. Both the potentials, such as expanding technological innovation enabled by the makerspace ecosystem [7] and the limitations, such as self-reference and restricted focus, will be explored. As described in [6], people risk 'aspiring to be "makers" instead of makers of things'. Other authors have noted a utopian view of maker culture in literature, calling for a more critical appraisal of its ability to support and empower [11].

Developing theory from practice

From a research perspective this is work that is happening "in the wild", as communities galvanise around real and situated matters of concern. These naturally add new constraints, and reveal opportunities that academia is only fairly recently beginning to explore. One of the challenges this situation poses is how to produce knowledge and theory during the process, and as a result, of such interventions. Among the questions for the HCI community that this workshop will address is how to assess the impact of these interventions from the perspective of the participating communities in ways that are meaningful and measurable. One example from within the *Making Sense* project is the use of Community Level Indicators (CLIs) [19]

Workshop Aims and Outcomes

The aims of the workshop are to identify research questions and directions, and to build relationships and networks. To this end the workshop is structured around supporting discussion with a view to forming new research collaborations and identifying routes to publication and dissemination.

Questions that the workshop will address include, but are not limited to:

1. What can the HCI community learn from maker and DIY cultures that could inform theory and practice?
2. How should HCI research, design and evaluation methods adapt to become more relevant to DIY and Maker culture?
3. How could HCI research methods inform and develop scaffolding approaches for these new and emerging participatory processes?
4. Are there examples of shifting power relationships, and evolving design paradigms, and when should design be done "from the ground up"?
5. What are the roles of the designer, maker, researcher and participant in social innovation and design?
6. What are the ideals and aspirations of maker culture and participatory design? How does — and could — the "democratisation of making" through fablabs, makerlabs etc, help realise these visions of "democratic design"?

About the organisers

Each of the organisers will participate in the review and selection process for submissions to the workshop. Several of the committee will participate in a panel session during the workshop.

Michael Smyth (main contact) is an associate professor at the Centre for Interaction Design at Edinburgh Napier University. His current research focuses on the design of toolkits for democratising media sharing in the physical environment.

Ingi Helgason is a researcher at the Centre for Interaction Design at Edinburgh Napier University. She is currently working on the EU H2020 MAZI project which is developing a Do-It-Yourself toolkit for building local, community wireless networks.

Frank Kresin is the Managing Director of the DesignLab at the University of Twente, and a fellow of the Waag Society, institute for art, science and technology in Amsterdam. He is the co-founder of Apps for Europe, City SDK, CineGrid, Code 4 Europe, Digital Social Innovation, Making Sense and the Smart Citizens Lab.

Mara Balestrini is CEO of Ideas for Change and a Senior Research Fellow at Fab Lab Barcelona. Her research is positioned in the intersection between participatory design, digital social innovation, civic tech and the commons.

Andreas Unteidig is a lecturer at the Design Research Lab/Berlin University of the Arts, where he explores the relationship of design, technology and the political. His project work revolves around the development and appropriation of DIY technology with activist communities.

Mark Gaved is a lecturer in the Institute of Educational Technology at The Open University, UK. His research focuses around informal, self-directed and community based learning, and the use and appropriation of technology in neighbourhood and educational settings.

Mel Woods is a reader at Duncan of Jordanstone College of Art & Design, at the University of Dundee. Her practice led research in Art and Design has developed interfaces and explored interaction between people to foster creativity and affect.

Shaun Lawson is a professor of Social Computing at Northumbria University, UK. His research focuses on the convergence of broadcast and social media in political and societal contexts and on how technology is used to support mental health, wellbeing and social support and cohesion.

Nick Taylor is a senior lecturer in DJCAD at the University of Dundee. His research focuses on participatory design and co-design with communities, including the use of DIY and maker practices to support grassroots action.

James Auger is an associate professor at the Madeira Interactive Technologies Institute. His current research focuses on the design of local community based approaches to off-grid energy solutions.

Lone Koefed Hansen is an assistant professor in Digital Design and Aesthetics, School of Communication and Culture, Aarhus University, Aarhus, where she researches digital art and aesthetics. Her research focuses on digital aesthetics, digital media, interaction design and pervasive computing.

Douglas Schuler is professor emeritus of the Evergreen State College and the board chair of the Public Sphere Project. He is particularly interested in how computing could promote and sustain civic intelligence to address 21st century issues and how researchers can play significant roles in bringing this about.

Paul Dourish is Chancellor's Professor of Informatics and Associate Dean for Research in the Donald Bren School of Information and Computer Sciences at UC Irvine. His research focuses primarily on understanding information technology as a site of social and cultural production; his work combines topics in human-computer interaction, social informatics, and science and technology studies.

Pre-Workshop Plans

A workshop website has been launched: www.makersdiyparticipatorydesign.wordpress.com

Paper submissions will be reviewed by the organising committee, and accepted papers will be published on the workshop website in advance of the workshop. It is expected that a maximum of 12 papers will be accepted in order to enable authors to present their work in person at the workshop. As well as including members of the organising committee, the workshop will also be open to conference delegates in order to encourage both whole-group discussions as well as smaller breakout group discussions.

Inviting participation

The workshop will be promoted through appropriate CHI, HCI and related mailing lists, making use of the organising committee's extensive academic and professional networks, and through social media channels. In addition, contact will be made with relevant communities, including makerspaces and fablabs in the Montréal area, in order to encourage local participation and input to the workshop from a practical, first-hand perspective. This will ground the discussions in practice. Members of the organising committee already have strong links with these global maker networks.

One-day Workshop Structure

The workshop will include the following sessions with approximate timings, taking into account breaks:

1. (60 mins) **Introduction and keynote talk** by one of the organising committee members as an introduction to the workshop topic and themes.
2. (30 mins) Invited presentation from **local makerspace and fablab representatives**.
3. (3 hours, before and after lunch) **15 minute presentations by the accepted authors (10 minutes plus questions)** of each of the accepted papers.
4. (45 mins) In the afternoon there will be a **panel session with 4 or 5 members of the organising committee** to summarise themes and research directions that have emerged during the day, with open, whole-group discussions.
5. (45 mins) To finish the workshop, there will be a **small group breakout session** with the aim of encouraging networking and relationship building around aligned interests. This final session will provide time for participants to continue particular discussions that have arisen throughout the day in a relaxed situation.
6. (15 mins) Round up and concluding remarks.

After the workshop, participants will be invited to continue discussions at an informal, social dinner in a nearby location.

Post-Workshop Plans

During the workshop, designated members of the organising committee will have the role of recording ideas, themes and discussions that emerge. After the workshop, these will be written up and included on the workshop website as a first step towards framing a research agenda. This will form the basis of a submission to the CHI 2019 conference, and an article for ACM Interactions magazine. Other options including a special issue of a relevant journal will be discussed at the breakout session at the end of the workshop day.

Call for Participation

CHI 2018 Workshop on Maker Movements, Do-It-Yourself Cultures and Participatory Design: Implications for HCI Research.

The organising committee invites submissions for this one-day workshop to be held as part of the ACM SIGCHI 2018 Conference on Human Factors in Computing Systems, in Montreal, Canada between 21st- 26th April 2018.

The workshop will address questions and themes around the relationships between maker and DIY culture and participatory design, with a particular focus on visions, values and the implications of these interconnections. Submissions can focus on any area of relevance to the themes of the workshop, including participatory design, maker culture, Do-It-Yourself approaches, social innovation, democratic design, research methods and frameworks, user and participant perspectives, creativity and materiality, grassroots activities and activism, and research "in the wild".

As the aim of the workshop is to encourage cross-disciplinary discussions, contributions can include theoretical, critical or practice-based formats, including frameworks, evaluations, case studies, etc. Submissions should be in the CHI extended abstract format (4-6 pages) in .pdf format. Submissions will be reviewed by the organising committee and selected based on relevance to the workshop themes, quality of submission and potential to stimulate discussion.

At least one author from each accepted submission must attend the workshop to present the work.

Important Dates:

- Participant submission deadline: 2nd February 2018
- Notification of acceptance: 22nd February 2018
- One-day workshop: 21st or 22nd April 2018

For more information, and details of how to submit visit:
www.makersdiyparticipatorydesign.wordpress.com

References

1. Mara Balestrini, Yvonne Rogers, Carolyn Hassan, Javi Creus, Martha King, and Paul Marshall. 2017. A City in Common: A Framework to Orchestrate Large-scale Citizen Engagement around Urban Issues. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems (CHI '17). ACM, New York, NY, USA, 2282-2294. DOI: https://doi.org/10.1145/3025453.3025915
2. Thomas Binder, Giorgio De Michelis, Pelle Ehn, Giulio Jacucci, Per Linde, and Ina Wagner. 2011 Design things. MIT press.
3. Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren. 2010. Participatory design and "democratizing innovation". In Proceedings of the 11th Biennial Participatory Design Conference (PDC '10). ACM, New York, NY, USA, 41-50. DOI=http://dx.doi.org/10.1145/1900441.1900448

4. Pelle Ehn. 1988. Work-Orientated Design of Computer Artifacts, Arbetslivscentrum, Stockholm.
5. Pelle Ehn. 2008. Participation in design things. In Proceedings of the Tenth Anniversary Conference on Participatory Design 2008 (PDC '08). Indiana University, Indianapolis, IN, USA, 92-101.
6. Tom Jenkins and Ian Bogost. 2015. Escaping the Sandbox: Making and its Future. TEI '15, January 16 - 19 2015, Stanford, CA, USA
7. Silvia Lindtner, Garnet D. Hertz, and Paul Dourish. 2014. Emerging sites of HCI innovation: hackerspaces, hardware startups & incubators. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14). ACM, New York, NY, USA, 439-448. DOI: https://doi.org/10.1145/2556288.2557132
8. Making Sense, Advanced and experiments in participatory sensing. 2017. Retrieved from http://making-sense.eu/
9. Nicolai Marquardt, Steven Houben, Michel Beaudouin-Lafon, and Andrew D. Wilson. 2017. HCITools: Strategies and Best Practices for Designing, Evaluating and Sharing Technical HCI Toolkits. In Proceedings of the 2017 CHI Conference Extended Abstracts on Human Factors in Computing Systems (CHI EA '17). ACM, New York, NY, USA, 624-627. DOI: https://doi.org/10.1145/3027063.3027073
10. MAZI Developing a DIY networking toolkit for location-based collective awareness. 2017. Retrieved from http://www.mazizone.eu/
11. David Roedl, Shaowen Bardzell, and Jeffrey Bardzell. 2015. Sustainable Making? Balancing Optimism and Criticism in HCI Discourse. ACM Trans. Comput.-Hum. Interact. 22, 3, Article 15 (June 2015), 27 pages. DOI: https://doi.org/10.1145/2699742
12. Douglas Schuler and Aki Namioka. 1993. Participatory Design: Principles and Practices. L. Erlbaum Associates Inc. Hillsdale, NJ, USA
13. Douglas Schuler. 2008. Liberating Voices: A Pattern Language for Communication Revolution. MIT Press.
14. Douglas Schuler. 2013. Creating the World Citizen Parliament: Seven Challenges for Interaction Designers. interactions, 20(3), 38-47.
15. Rachel Charlotte Smith, Claus Bossen & Anne Marie Kanstrup. 2017 Participatory design in an era of participation. CoDesign Vol. 13 , Iss. 2,2017
16. Michael Smyth and Ingi Helgason. 2017. Making and Unfinishedness: Designing Toolkits for Negotiation, The Design Journal, 20:sup1, S3966-S3974, DOI: 10.1080/14606925.2017.1352899
17. Susan Leigh Star and James R. Griesemer. 1989 Institutional Ecology, 'Translations' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907-39. Social Studies of Science, 19(3), 387-420. Retrieved from http://www.jstor.org/stable/285080
18. Nick Taylor, Loraine Clarke, and Katerina Gorkovenko. 2017. Community Inventor Days: Scaffolding Grassroots Innovation with Maker Events. In Proceedings of the 2017 Conference on Designing Interactive Systems (DIS '17). ACM, New York, NY, USA, 1201-1212. DOI: https://doi.org/10.1145/3064663.3064723
19. Mel Woods, Drew Hemment, Lily Bui. 2016. D5.4 Community Level Indicators. Making Sense, Advances and experiments in participatory sensing. http://making-sense.eu/wp-content/uploads/2016/09/D5.4-COMMUNITY-LEVEL-INDICATORS.pdf