Rural Computing: Beyond Access and Infrastructure

Jean Hardy
University of Michigan
Ann Arbor, Michigan, USA
jkhardy@umich.edu

Dharma Dailey
University of Washington
Seattle, Washington, USA
ddailey@uw.edu

Susan Wyche
Michigan State University
East Lansing, Michigan, USA
spwyche@msu.edu

Norman Makoto Su
Indiana University
Bloomington, Indiana, USA
normsu@indiana.edu

Abstract

Computing tends to be associated with cities and urban areas, where innovation in Information and Communication Technologies (ICTs) is often seen as coming from and where a majority of users live. In this workshop, we seek to offer a counterpoint to CSCW and other computing disciplines' biases towards the urban and focus on ICT use and design in rural areas. In particular, our goal is to recognize rural areas not just as sites where ICT access and infrastructures need improvement, but as places of innovation and exploration that can inform a more representative and just understanding of people and users. This workshop offers a space for these conversations and to bring together and build a network of established and emerging scholars in the CSCW and adjacent communities conducting research in and about the rural.

Author Keywords

Rural Computing; Rural HCI; ICTD; HCI4D

Introduction

There is growing interest in CSCW and allied disciplines (e.g., HCI and ICTD) in rural areas. In particular, scholars have begun to investigate how to make these

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What is rural?

"Rurality" is by definition a relational category, used to denote social and spatial difference; thus, it is always held in contrast to the urban or the suburban.

There are many understandings and a history of contention with respect to the proper definition of "rural" [1, 16]. This workshop utilizes this unsettled ground as a starting point for conversations on what might rural mean for computing.

Participants in this workshop should come prepared to discuss how they envision deploying rural as a relational category in their work. The organizers will provide participants with resources for these conversations ahead of time.

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sites more central to computing research and design, and not just as sites where access and infrastructures need improvement. In this workshop, we will foreground how rural areas and their relationship to technology can draw attention to significant topics in HCI and CSCW, including biases inherent in crowd computing platforms, sustainable practices, design, and aging populations. We use this as an opportunity to highlight and explore the boundary that frequently separates research being done in rural areas of so-called "developed" countries from that of "developing" countries. We also recognize that the importance of ICT non-use and other aspects of rural life, such as agriculture, tight-knit communities, distance, and remoteness, can inform our research and practice.

This workshop builds upon a successful "Birds of a Feather" event at CSCW 2017, where a dozen researchers gathered to discuss their diverse interests related to rural computing. Rather than regard rural populations as "other", or peripheral to mainstream HCI [23], we concluded that there was an opportunity to make studies of rural technology use and users more integral to the field. This workshop will do this by bringing together researchers and practitioners to explore: What would computing (and CSCW and HCI in particular) look like when it prioritizes the experiences and needs of people in so-called marginalized and peripheral places?

Topics of interest we see encompassed in this question (and in this workshop) are:

- The design and use of ICTs in rural geographies, including rural cultures of technology use, rural hacks and work-arounds, and non-use.
- Multiple ruralities (e.g., "developing regions," queer and other identity-based understandings of rurality, etc.).
- Methodological challenges of the rural, including the changing and context-dependent meaning of "rural" and the challenge of bridging rural and non-rural populations.
- Moving HCI and ICTD discourse, research, and practice beyond questions of access and infrastructure.
- Identifying overlap with research in ICTD, but also highlighting how rural computing (and related disciplines like rural, environmental, or community sociology) can offer new CSCW insights distinct from and unaddressed by ICTD
- Recognizing that understanding ICT use in rural areas can contribute to significant topics of interest in CSCW, such as sustainability, education, and cross-cultural understanding.
- How studies of computing can learn from economic and cultural activities especially present in the rural (e.g., agriculture, natural resource extraction, differing values, etc.).

Background

The dominant narrative in computing has been a diffusion of innovation radiating out from urban centers (where technologies are largely developed) to rural locales. When rurality is addressed if at all, it is frequently focused on a deficit model, or what rural areas lack (e.g., strong Internet infrastructure, economic development). Yet a growing body of work shows that rural communities and individuals

appropriate computing technologies differently than their non-rural counterparts (e.g. [7, 10, 11]).

Early studies of rural computing came primarily from business and organizational studies. These studies tended to focus on ICT adoption and how to adapt them to rural contexts [7, 19], such as teleworking in rural European regions [25] or understanding ICT use *in situ* [10]. This literature also provided recommendations on developing ICT policy specific to rural regions [19, 20] or the education among rural firm managers to improve ICT adoption [21]. More recently, as CSCW and HCI researchers have become interested in "developing regions", we see growing interest in understanding how ICTs support significant activities in, for example, rural Africa, such as agriculture [28]. These scholars recognize the challenges in rural areas (e.g., limited access to electricity and water) and also the ICT opportunities that emerge when rural residents work to address them, such as solar-powered approaches to mobile phone charging [27].

This desire to improve technological situations for those in developing regions is also found in research projects occurring in the Global North. Some recent projects working in the realm of design interventions have sought to: ease barriers to cultural information sharing in rural areas [24]; design commerce-based application for a rural farmer's market [3]; and help a remote island leverage new open data practices [5].

As in non-rural areas, computing technologies are increasingly integrated into the social fabric of rural daily life. Examining rural computing can extend our understanding of user groups that traverse geographic boundaries. For example, Mary Gray's early studies [10] on the use of the Internet in the early-to-mid 00s by LGBT youth demonstrated the unique and liberatory uses that emerged from those populations. Similarly, [11] compared how location-based mobile applications for gay men were discursively constructed by their creators, and how that dramatically differed from the use of these same applications "in the wild" by rural gay men.

The above examples also illustrate how uses vary as technologies are taken up across multiple geographies. Therefore, considering the rural also brings a new lens to extant technologies. One set of technologies in particular has shown the importance of considering rurality. Researchers have repeatedly found social computing platforms that rely on publicly available user-generated content have an urban bias in their content [12-14]. Non-rural users may incorrectly interpret the way rural users engage with these platforms as non-use [4]. Understanding rural/non-rural differences in content and use becomes increasingly important as social computing is integrated into important activities like crisis response [4].

Rural Community, Opportunity, and HCI Innovation
Rural areas in the US face harsh economic realities—higher poverty and unemployment rates as well as brain drain [6]. However, recent surveys suggest that the biggest divide between rural and urban areas is not an economic one but a cultural one. Almost half of rural residents say that their *values* are very different from urbanites [26]. Rural Americans are proud of their close-knit, often face-to-face, social networks and the ability to trust their communities [6]. We suggest that bridging these divides is especially timely given

increased urban interest in traditionally "rural" skills such as farming, bee-keeping, and hunting [2]. Despite their expertise, HCI work has shown that the knowledge of rural users is often undervalued [22].

We recognize that research and practice related to rural ICTs, use, non-use, and various cultural practices has the opportunity to benefit CSCW and related communities. We use the term *rural computing* to draw attention to innovative practices taking place in rural contexts as communities and individuals re-situate and re-appropriate technology that may or may not have been designed with them in mind. For example, an understanding of rural practices for mobile phone repair contributes to discussion about sustainability design more broadly [27].

Rural communities also place great value on the knowledge of older adults; the organizational practices in which this knowledge is shared may have broad implications for CSCW researchers who engage with older adults. Disciplines such as knowledge management have long acknowledged the value of older adults in their organizations [15], yet these findings have not been applied outside the company to rural settings. Attempts to bridge the rural and urban divide also contributes to the wider agenda in HCI of reflective and persuasive designs. Reflecting on the inherent differences of rural use that have emerged in recent research, we invert the site of innovation thereby seeing HCI and CSCW through a new landscape.

Workshop Description

Goals

Our goal for this workshop is explore rural computing as a distinct theory space by *bringing together established and emerging scholars in the CSCW along with scholars conducting research in and about the rural in related fields.* We seek to:

- Map respective understandings of "rural computing," including its relationship to established research fields such as ICTD and rural studies.
- Explore how the practices and expertise of the rural can inform design spaces and theories for CSCW and HCI generally
- Highlight research approaches that delve meaningfully into rural peoples' perspectives on the technologies in their hands.
- Establish working relationships that further the publication of research related to rural computing.

Workshop Structure

The workshop is a forum to support and promote rural computing research and to reflect on the current state of our field. We will bring established and emerging scholars who have experience in their respective fields to speak to us about challenges and opportunities in establishing rural research agendas. Participants will introduce their research in brief presentations with ample time for collective reflection. The networking and connection opportunities the workshop provides will help build a community of rural computing scholars.

Activities & Schedule
Our preliminary one-day workshop schedule is as follows:

- *8:30-9am* - Arrival
- *9-9:15am* - Brief opening of the workshop by the organizers and establishing some common ground for the workshop space.
- *9:15-11am* - Participants give short presentations (~3-4 mins) that outline who they are and how they approached the question guiding their position papers.
- *11am-12pm* – We will break out into small groups to discuss commonalities between participants and identify unifying questions of rural computing research.
- *12-1:30pm* - Lunch in small groups based on interest related to questions and problems outlined in morning session.
- *1:30-3pm* - A "fireside conversation" between an organizer and an outside scholar with experience navigating rural research partnerships, especially with nearby University Extension offices. We have identified professors from Rutgers University who would be a good fit for this role: Melanie McDermott, Karen O'Neill, and Ethan Schoolman (all from the Human Ecology department). This conversation would also be based on the topics brought up in the position papers submitted to the workshop.
- *3-4:15pm* - Small group breakouts whose purpose is conversation and brainstorming about each other's work, of which the purpose is to generate a rough abstract for each

participant that could be used to propose a journal special issue on Rural Computing.
- *4:15-5pm* - Concluding the workshop with a group conversation and task generation session planning a special issue (e.g., in Interactions or TOCHI journal) and its continuation in another workshop (e.g., the following CHI or CSCW).
- *5-6:30pm* - Break
- *6:30pm* - Dinner together off-site.

Workshop Promotion and Other Details
We will ask participants to submit position papers that explore how they envision their research currently or in the future addresses the question: How can computing research broadly, and CSCW and HCI in particular, prioritize the experiences and needs of people in rural places? The call for the workshop will be distributed across list-servs with subjects relevant to this workshop (e.g., those dedicated to HCI4D/ICTD and rural sociology). Furthermore, we will reach out to faculty and students at rural colleges and universities— populations that are historically under-represented at CSCW, and in the HCI community more broadly. Examples of these institutions include: Berea College in Kentucky, Ferrum College in Virginia, and Michigan Technological University in Michigan. We seek to have no more than 25 participants. A website has been created and will be populated with workshop information if the workshop is accepted: www.RuralHCI.info

Organizers
Jean Hardy is a PhD Candidate at the University of Michigan School of Information. His research focuses on ethnographic studies of technology use by rural LGBTQ

people, as well as the role of economic development in the rural Midwestern United States. His work on this received a Best Paper Honorable Mention at CSCW 2017 where he also co-convened the initial meeting that provoked this workshop.

Dharma Dailey is a PhD Candidate at the University of Washington. She has done two ethnographic studies on social media use by rural communities after a crisis. Her work on this received a Best Paper Honorable Mention at CSCW 2017.

Susan Wyche, PhD, is an assistant professor in the Department of Media and Information at Michigan State University, where she is also affiliated with the university's African Studies Center. She is interested in HCI and ICTD and for the past eight years has worked in Western Kenya investigating mobile phone and social media use among rural farmers. This research is currently supported by an NSF CAREER Award.

Norman Makoto Su, PhD, is an assistant professor in the School of Informatics, Computing, and Engineering at Indiana University Bloomington. He does research in HCI and CSCW that characterizes the often messy relationship subcultures have with technology. He is currently engaged in ethnographic fieldwork on the local, value-diverse, rural subcultures of Indiana.

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