The Changing Contours of "Participation" in Data-driven, Algorithmic Ecosystems: Challenges, Tactics, and an Agenda

Christine T. Wolf
IBM Research, Almaden
San Jose, CA, USA
ctwolf@us.ibm.com

Min Kyung Lee
Carnegie Mellon University
Pittsburgh, PA, USA
mklee@cs.cmu.edu

Haiyi Zhu
University of Minnesota
Minneapolis, MN, USA
zhux0449@umn.edu

Jed R. Brubaker
University of Colorado Boulder
Boulder, CO, USA
jed.brubaker@colorado.edu

Julia Bullard
University of British Columbia
Vancouver, BC, Canada
julia.bullard@ubc.ca

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Abstract
Contributing to a growing attention to algorithms and algorithmic interaction in the CHI and CSCW communities, this workshop aims to deal centrally with the topic of human "participation" and its changing role to data-driven, algorithmic ecosystems. Such a focus includes projects that involve users in the design of algorithms and "human-in-the-loop" systems, broader investigations into the ways in which "participation" is situated in data-driven activities, as well as conceptual concerns about participation's changing contours in contemporary social computing landscapes. This one-day workshop will be led by academic and industry researchers and sets out to achieve three goals: identify cases and ongoing projects on the topic of participation in algorithmic ecosystems; create a tactical toolkit of key challenges and strategies in this space; and set a forward-facing agenda to provoke further attention to the changing role of participation in contemporary sociotechnical systems.

Author Keywords
Participation; Big Data; algorithms; algorithm design; values in design; data-driven design

ACM Classification Keywords
Human-centered computing → Human computer interaction (HCI); Theory of computation → Design and analysis of algorithms

Introduction

In recent years, there has been a growing attention to human-algorithm interactions in CHI and CSCW communities as the use of algorithmic decision-making systems grow. Algorithmic curation of content, including prioritizing, classifying and filtering content, is behind most influential social media sites [3]. Beyond social media, algorithmic decision-making systems are on the rise in a wide variety of domains, with recent work investigating their use in a number of settings, including classrooms [10], gig work [11, 13], archival practice [21], online advertising [7], and criminal justice systems [6], to name a few.

An emerging body of literature has shown that algorithmic systems (often based on machine learning approaches) can fail in multiple ways. One way algorithmic systems can fail is by not engaging with (and therefore losing the acceptance of) users and stakeholders [4, 5, 14]. There is often a disconnect between mathematically rigorous machine learning methods and social, organizational, and institutional realities, constraints, and needs [e.g., 22, 23]. Furthermore, approaches that largely rely on automated processing of historical data can repeat and amplify historical stereotypes, discriminations, and prejudices [e.g., 1].

This workshop aims to contribute to these conversations by exploring how human-centered and participatory methods can inform the design of algorithmic systems.

This workshop approaches "participation" from multiple vantage points. Participatory approaches, for example, take the form of design projects that aim to incorporate stakeholders directly in the design of algorithms [e.g., 20]. User-centered design approaches, meanwhile, take users' needs and concerns as an initial design input in the creation of algorithmic systems [e.g., 12]. Such projects echo the longstanding tradition of participatory design (PD) and user-centered approaches within CSCW and raise a unique set of concerns about values, priorities, and influence. For the spirit of PD to flourish, stakeholders must have the capacity for meaningful influence in the direction of a system's development [15]. But holding true to this spirit can prove challenging when algorithms are often invisible [19], input into their development may not always be from direct community stakeholders [20], and users of the resulting algorithmic system might hold conflicting views and understandings of when and how algorithms operate [18]. Furthermore, the capacity for algorithms to be fair or enact fairness can be a topic of debate [14, 24] and communities may disagree on whether algorithms and other forms of automation are suitable interventions in particular contexts [2, 17].

A long line of research on "human-in-the-loop" systems and interactive machine learning techniques offers computational techniques to incorporate human inputs into algorithmic systems [e.g., 8]. Exploring applications of this work into the new social contexts of algorithmic system opens up new research questions. While the human relationship with algorithmic, machine action can be confrontational in some contexts [16], in

Workshop Timeline

July 27: Workshop Proposal Due

Aug 10: Notifications of Workshop Proposal Acceptance

Aug 17: Launch Workshop website, which includes CfP for potential participants to submit positions papers

Aug 17-Sept 28: Active recruitment and distribution of Workshop CfP

Sept 28: Position papers due

By Oct 5: Position paper submitters are notified of acceptance

By Oct 19: Position papers are posted to the workshop website, participants are asked to read ahead of workshop

Nov 3: Workshop takes place ahead of CSCW'18 in Jersey City, NJ

others it might be leveraged to promote social welfare and community cohesion [9]. The point such tensions make is that algorithmic interactions are not zero-sum – neither wholly positive nor negative. Instead, the CSCW community is called to take care and pay close attention to how collaboration unfolds in such interactions, noting the ways in which individuals' capacity, agency, and influence to participate is both shaped by algorithms but also the broader organizational and institutional settings within which such encounters take place.

Algorithms cannot be understood in isolation from the data that both shape and are shaped by them and the broader settings within which they are deployed and interact. Accordingly, this workshop is also interested in investigating the topic of algorithmic participation from a broader perspective, investigating where, how, and to what effect participation is a phenomenon of interest across data-driven ecosystems. How do questions of data collection, awareness, and consent, for example, inform the question of algorithmic participation? Such a focus can fuel conceptual discussions about the changing contours of participation in contemporary social computing landscapes. What does it mean to "participate" in such landscapes? Has the nature of "participation" changed, particularly in so-called "Big Data" systems that incorporate millions of users, and billions of data points? Such developments challenge us to probe further into the nature of participation, and what it takes to not only participate, but participate meaningfully.

This one-day workshop sets out a goal of creating a "tactical toolkit" – a workshop report aimed to support and provoke action through three objectives:

1. Identifying cases and ongoing projects on the topic of participation in data-driven, algorithmic ecosystems
2. Listing key challenges and strategies in this space;
3. Setting a forward-facing agenda to provoke further attention to the changing role of participation in contemporary sociotechnical systems.

Workshop participants will be asked to submit short position papers (2-4 pages) dealing with the topic of participation in contemporary social computing systems. The themes mentioned below are meant to generate discussion and provoke ideas to be explored throughout the workshop. Position papers can focus on one or more themes, but we also welcome perspectives that more broadly address any topic of interest to the workshop agenda.

Workshop Themes
Who? – Who are stakeholders in algorithmic ecosystems? What are the "stakes" held in data-driven, algorithmic ecosystems and what are the politics and power dynamics amongst stakeholders?

What? – What does it mean to "participate" in algorithmic ecosystems? Has the nature of "participation" changed, particularly in large-scale, "Big Data" systems?

How? – How do we include stakeholders into the design of data-driven, algorithmic systems? How is "participation" measured and evaluated? By whom? What forms of gatekeeping or barriers arise? What tools and techniques are needed to enable participation?

Tentative Workshop Schedule

9:00-9:15
Welcome, Settle In, Agenda
9:15-10:15
Position Papers Round Robin
10:15-10:30
Coffee Break
10:30-11:30
Opening Sprint: Key Challenges
11:30-12:00
Small Group Readouts/Shuffle
12:00-1:30
Lunch
1:30-2:30
Tactical Sprint: "How Might We…?"
2:30-3:00
Small Group Readouts/Shuffle
3:00-3:15
Coffee Break
3:15-4:15
Strategic Sprint: Prioritizing Outputs of Prior Sprints
4:15-4:45
Small Group Readouts
4:45-5:00
Synthesis and Wrap up

Where? And When? – Where does participation take place? And when? Do algorithmic ecosystems require us to re-think notions of participation as synchronous, time-bounded events?

Why? – How might different cases and domains invoke different incentives (i.e., what types of market incentives operate in "free" platforms as opposed to enterprise software)? What are the pros and cons of allowing stakeholders to participate in the algorithmic ecosystem?

Workshop Goals

The main deliverable of the workshop will be a digital workshop report, a "tactical toolkit," consisting of three sections:

1 – Current Work on Participation in Data-driven, Algorithmic Ecosystems
The first section of the toolkit will be a collection of current and ongoing projects on the topic of algorithmic participation, identified from position papers, as well as relevant citations and references shared during the workshop.

2 – *Key Challenges and Tactics*
The second section of the toolkit will identify this space's key challenges, as well as tactics and strategies to address them, as identified through the day's work.

3 – *What's Next? Grand Challenges and Opportunities*
Finally, the toolkit will conclude by setting out a forward-looking agenda for continued work in this space. Now that we have set out the first section (cases and ongoing projects around participation) and our second section (key tactical challenges and strategies to address them) what's next in this space? What are untapped opportunities we should explore next?

Workshop Outcomes

The workshop has two expected outcomes:

1. Establish a network of people working on the topic of participation in data-driven, algorithmic ecosystems
2. Create a tangible deliverable in the form of a tactical toolkit that outlines: current work in this space; key challenges in this space and strategies to address them; and an agenda for further research to drive future research efforts within CSCW and related communities

Workshop Activities

Pre-Workshop Activities
By October 5, 2018, potential participants are asked to submit a short position paper (2-4 pages) on the topic of participation in data-driven, algorithmic ecosystems. These papers can be related to one or more of the workshop themes, or can more broadly address any topic of interest to the workshop agenda.

Workshop Activities
A tentative workshop schedule has been included in the left margin. Below are descriptions of each proposed activity.

Position Papers Round Robin: Each participant presents a short "briefer" on their position paper. Workshop organizers will order papers ahead of time based on emergent themes, creating 3-4 "affinity clusters" (small working groups). Participants will be asked to highlight

their domain/case, methodology, central research question and/or key findings, as appropriate, during their "briefer." Depending on the composition and size of the workshop, the Round Robin will be single track (large group discussion with the workshop cohort as a whole) or in parallel groups (small group discussion within each affinity cluster).

The workshop will consist of three hands-on sessions called "sprints" with readouts after each. After each readout, participants are given the opportunity to shuffle or change groups for the following sprint, if they would like, to facilitate cross-group collaboration.

Opening Sprint: Key Challenges: In each small working group, participants will each share 2-3 key challenges they see in this space. Organizing these into higher-order themes, each group will work with post-it notes and large poster boards to produce an affinity diagram that they will share with the large group during the readout session.

Tactical Sprint: "How Might We…?": Taking the output from the first sprint, here each group will brainstorm approaches to address the challenges, identifying key stakeholders, dependencies, and resources involved in each approach. Organizing these into higher-order themes, each group will work with post-it notes and large poster boards to produce an affinity diagram that they will share with the large group during the readout session.

Strategic Sprint: Prioritizing Outputs of Tactical Sprint: The final sprint will build on the outputs of the first two, taking the challenges and possible ways to address those challenges and creating a strategic list of priorities for action taking into account the different dependencies and requirements identified earlier. Similar to prior sprints, each group will organize this list, producing an affinity diagram that they will share with the large group during the readout session.

Post-Workshop Activities
The various collateral created throughout the day will be the inputs for the workshop deliverable, a tactical toolkit.

Workshop Logistics

This one-day workshop will take place on either November 3rd or 4th, 2018, the weekend before the CSCW'18 conference.

Number of Participants
The target number of participants for this workshop is between 20-25, to facilitate a range of perspectives but maintain a number conducive to in-depth group discussions.

Means of Recruiting Participants
We will set up a workshop website, which will feature the body of this workshop proposal. The website will provide details on the Call for Participation (CfP) for potential participants, relevant due dates, and pre-workshop preparation. The organizers will distribute the CfP amongst their various professional networks, including various social computing listservs.

Equipment and supplies
With 20-25 participants, and the 5 workshop organizers, we will need a room that can accommodate 30 people. We also request that the room is configurable, with tables and chairs that can be moved

and arranged as needed to facilitate small group discussions. We will also need basic conference accommodations (WiFi access, digital projector kit, nearby restrooms). We will also need large, easel-style pads and small post-its for notetaking (to be provided by workshop organizers if unavailable from the workshop program organizing committee).

Workshop Organizers

Christine T. Wolf is a Research Staff Member at IBM Research, Almaden (San Jose, CA). Her research investigates how people make sense of (and transform) emergent technologies through everyday practice. Adapting techniques from PD, her work currently focuses on the incorporation of data analytics into organizational work practices and draws on perspectives from information systems (IS), computer-supportive cooperative work (CSCW), and technology policy. She has co-organized workshops at iConference and the Participatory Design Conference (PDC).

Haiyi Zhu is an assistant professor in the computer science department at the University of Minnesota, Twin Cities. Her research integrates social science theories, design methods, and machine learning to build better large-scale socio-technical systems. One of her ongoing projects is to propose and validate a new method for developing intelligent algorithms, which she called "Value-Sensitive Algorithm Design". The method engages relevant stakeholders in the early stages of algorithm creation and incorporates stakeholders' tacit values, knowledge, and insights into the process of creating an algorithm. She has received Best Paper Honorable Mention in CHI' 2018, CHI' 2016, CHI'2013, CSCW'2012, Newell Allen Research Award 2016, Human Factor Prize in 2013, and NSF CRII award 2016. She received a PhD in Human-Computer Interaction from Carnegie Mellon University.

Julia Bullard is an assistant professor at the University of British Columbia iSchool (Library, Archival and Information Studies) where she examines how communities instantiate their values in infrastructure, particularly through the design of knowledge organization systems. One of her current concerns is how communities negotiate between automated and conventional methods in creating and maintaining large-scale metadata systems and what methods of participation make community-supported systems trustworthy and legitimate. She holds a PhD in Information Studies from the University of Texas at Austin and an MA in Cultural Studies & Critical Theory from McMaster University.

Min Kyung Lee is a research scientist in Human-Computer Interaction in the Machine Learning Department at Carnegie Mellon University. Dr. Lee has conducted some of the first studies that empirically examine the social implications of algorithms' emerging roles in management and governance in society, looking at how people perceive algorithms and how we can design fairer and more trustworthy algorithmic services that work in the real world. Dr. Lee is a Siebel Scholar and has received several best paper and honorable mention awards in venues such as CHI, CSCW, DIS and HRI, as well as an Allen Newell Award for Research Excellence. She is an associate editor of the ACM Transactions on Human-Robot Interaction. Her work has been featured in media outlets such as the New York Times, New Scientist, and CBS. She received a PhD in Human-Computer Interaction and an MDes in Interaction Design from Carnegie Mellon.

Jed R. Brubaker is an assistant professor in Information Science at the University of Colorado Boulder where he studies how identity is designed, represented, and experienced in socio-technical systems. His current work focuses on the design of algorithmic interaction design (AIxD) and how to improve the design of social algorithms to better understand for the social nuances of data. He has co-organized workshops at CHI and ICWSM.

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