



## Future of Work at the Human-Technology Frontier: 2022 Annual PI/Co-PI Awardee Meeting

June 27, 2022 | 1:00-4:00 p.m. EST

Zoom Meeting

Chat Links and History

Links from Chat History		
<i>Participant</i>	<i>Topic</i>	<i>Link</i>
Saiph Savage	Example of how gig platforms (Uber) have been using data to manipulate and harm workers while increasing their profits	<a href="https://qz.com/952445/uber-has-crossed-the-line-from-motivating-employees-to-actively-manipulating-them/">https://qz.com/952445/uber-has-crossed-the-line-from-motivating-employees-to-actively-manipulating-them/</a>
Lydia Chilton	PI project posters	<a href="https://www.sri.com/the-future-of-work-at-the-human-technology-frontier/">https://www.sri.com/the-future-of-work-at-the-human-technology-frontier/</a>
Saiph Savage	Dr. Savage's slides	<a href="https://1drv.ms/p/s!AjS5UB68rMQChVf5_zuA_QTyOGwk?e=DTt0mg">https://1drv.ms/p/s!AjS5UB68rMQChVf5_zuA_QTyOGwk?e=DTt0mg</a>
Jordan Berg	<i>The Work of the Future</i> , co-authored by David Autor, David Mindell, and Elisabeth Reynolds	<a href="https://mitpress.mit.edu/books/work-future">https://mitpress.mit.edu/books/work-future</a>

**[00:48:25] Yin Aphinyanaphongs:** In healthcare, it already true that AI can perform better than experts at some tasks and the skilled providers will no longer be the “gold standard.”

**[00:49:25] Dan Cosley (NSF):** Maybe, though questions of accountability, acceptability, and fit into practice and decision-making still lurk there...

**[00:49:49] Yin Aphinyanaphongs:** Similar conversations in direct-to-consumer AI models for digital mammogram for example is another facet.

**[00:50:09] Yin Aphinyanaphongs:** Bypassing experts for AI driven second opinions.

**[00:50:58] Dan Cosley (NSF):** More generally, folks should feel free to drop questions/comments into the chat that you'd like panelists to address; in moderator role, Betty and I will help surface them.

**[00:51:17] Yin Aphinyanaphongs:** Case studies in other countries with less regulatory issues in healthcare have shown that diagnoses do happen for breast cancer (though huge selection bias) on patient stories of positives.

**[00:51:36] Yin Aphinyanaphongs:** When having a location to upload mammograms for AI review.

**[00:55:17] Saiph Savage:** A lot of entry level jobs are lost due to automation. Making it harder for new workers to join the workforce. How do you imagine addressing this problem? Is it something employers should address? Community Colleges? How might governments help address this problem?

**[00:55:25] Jialei Yang:** we also need to note that this general-purpose technology (AI) is good at some use cases, but not good at everything.

**[00:56:35] Deb Doing:** I'm really glad to hear that reasoning, literacy, and civil discourse skills are being highlighted as important for success in this new industrial economy. I hope that we can tether the call to foreground this kind of education to policy and funding structures. Right now, those of us who teach in the humanities—the very disciplines that teach these kind of skills—cannot do these things effectively because of lack of hiring lines with sustainable wages and job security in the academy; lack of funding pockets—including vast inequalities in how STEM is federally funded vs humanities funding—to subsidize research and development about how to do so effectively in a changing economy of higher education, and a fair amount of administrative obstruction to doing so with innovation.

**[00:58:30] Berk Calli:** I believe the arguments in this talk assumes a constantly growing economy. However, for mitigating effect of climate change, if we need to stall or even reduce production, wouldn't it boost the negative impact of automation to jobs?

**[00:58:52] Marian Chertow:** What do you predict will come of the attention paid now in the US for private company workers joining unions such as Starbucks, Amazon, etc.?

**[00:59:36] Berk Calli:** Similarly, when there is stagnation in economy due to economic crises, how does it impact the workforce displacement picture?

**[00:59:45] Ron Eglash:** Digital support for worker-owned companies – “platform cooperatives” – are an exciting new trend. Rather than exclusively depend on privately owned companies for their charity, we could think about research on the relation of automation to worker ownership.

**[00:59:59] Saiph Savage:** Digital labor has isolated workers, making it harder for them to unite (before they might have been able to meet and connect in person more). How do you imagine that we can help digital workers to unite?

**[01:07:58] Saiph Savage:** Great talk Professor Juliet. As Professor Juliet mentioned, gig platforms have been using data to manipulate and harm workers while increasing their profits. Here is an example from Uber: <https://qz.com/952445/uber-has-crossed-the-line-from-motivating-employees-to-actively-manipulating-them/>

**[01:09:52] Juliet Schor:** On platform cooperatives—I did the first academic study of a platform coop/there's a great deal of activity now going on to create coops, but market dominance by the big firms is a significant barrier to their growth. A decade after people got excited about platform coops, they have virtually no presence in the US. There's a bit more growth in Europe, especially in food delivery, where “cycling culture” is stronger.

**[01:11:34] Julia Ticona:** I'd love to hear more about the way the panelists see the role of the state & gov't in the ethical issues in their cases. It seems like the state plays a role in dealing with the negative results of these problems, but are there other ways for us researchers to think about gov'ts role in our cases?

**[01:16:31] Chris Callison-Burch:** White collar work is a going to be a target of automation.

**[01:18:09] Chris Callison-Burch:** I asked GPT-3 to “Write a short academic essay about the potential for AI automating white collar jobs, and what the societal implications would be.”

**[01:18:22] Chris Callison-Burch:** The potential for artificial intelligence (AI) to automate white-collar jobs is significant. A recent study by McKinsey Global Institute estimates that as many as 45 percent of the activities individuals are paid to do in the United States could be automated using existing technology. This would have major implications for the workforce, as well as for society as a whole.

There are a number of reasons why AI could automate white-collar jobs. First, many of these jobs are highly routinized, with little need for human judgment or creativity. For example, tasks like data entry, claims processing, and simple customer service inquiries can all be automated using AI. Second, AI is becoming increasingly sophisticated and capable, as evidenced by the rapid growth of machine learning. This means that more and more jobs that once required human skills can now be done by machines.

**[01:18:28] Dan Cosley (NSF):** Was it afraid of its job being supplanted by better AI? :)

**[01:18:30] Chris Callison-Burch:** The implications of AI automating white-collar jobs are both economic and social. Economically, there would be a significant shift in the labor market, with many workers losing their jobs to machines. This could lead to increased inequality, as those who are able to find new jobs in the AI economy may be better off than those who are not. Socially, there could be a number of disruptions, as those who are displaced by AI may have difficulty adapting. There could also be a reduction in the overall demand for labor, as companies seek to replace workers with cheaper machines.

Overall, the potential for AI to automate white-collar jobs is significant. The economic and social implications of this shift are likely to be profound.

**[01:19:07] Saiph Savage:** Here are my slides. Thank you, Libby, for the interest:  
[https://1drv.ms/p/s!AjS5UB68rMQChVf5\\_zuA\\_QTyOGwk?e=DTt0mg](https://1drv.ms/p/s!AjS5UB68rMQChVf5_zuA_QTyOGwk?e=DTt0mg)

**[01:19:14] Dan Cosley (NSF):** Double-official zoom meeting. 😊

**[01:19:17] Chris Callison-Burch:** We have all been there.

**[01:19:27] Mindy Bergman:** ^^yes

**[01:22:18] Craig Woolsey:** Assuming we can address the economic concerns that worry Martin Ford due (the erosion of comparative advantage), I wonder if humanity will move away from deriving our individual value from the jobs that we do...

**[01:23:26] Judy Wawira Gichoya:** What's the book from New York that was mentioned?

**[01:23:48] Saiph Savage:** Thank you for the great moderation!

**[01:23:49] Craig Woolsey:** I think one of the co-authors was David Autor

**[01:23:51] Kwame Porter Robinson (w/ Ron Eglash, Umich):** re: Woosley - Maybe converting to artisan workers with pride in craft, supported by AI would be a way. PI Ron Eglash has been researching these lines

**[01:25:21] Jordan Berg (NSF/ENG):** Maybe this one? <https://mitpress.mit.edu/books/work-future>

**[01:25:36] Judy Wawira Gichoya:** Thanks Jordan

[02:27:41] **Dan Cosley (NSF)**: Gymnasts and parkour runners – worried about their future of work.

[02:32:24] **Georgia Chao**: Great presentation – thanks!

[02:33:02] **Alexandra Medina-Borja (NSF)**: Thank you for that! Interesting remarks about the importance of hardware!

[02:33:31] **Balakrishnan Prabhakaran**: Very enjoyable presentation, thanks.

[02:34:07] **Marc Raibert**: Glad you caught the hardware comment. It is important but sometime ignored these days.

[02:34:14] **Betty Tuller (NSF)**: Cognitive science also has a history of ignoring the importance of the “hardware” — that is the body of which the brain is a part

[02:35:29] **Marc Raibert**: I think the interaction of the athletic AI (including the hardware) and the cognitive AI will be very interesting and productive.

[02:35:52] **Shimon Y Nof**: Thanks Marc! It is insightful

[02:36:36] **Jordan Berg (NSF/ENG)**: Marc, what did “HPU” stand for in your hardware slide?

[02:37:23] **Thomas F. Shipley**: Psychology has ignored hardware often to discover that it helps to understand more complex thinking. Any sense that the action work to achieve robot skill will move into thinking (e.g., recognition)?

[02:37:33] **Marc Raibert**: Hydraulic Power Unit. The humanoid at that scale is made possible by the HPU shown in that picture. 5Kw in 5 Kg

[02:37:42] **Jordan Berg (NSF/ENG)**: Thanks!

[02:38:42] **Marc Raibert**: The ethology work is interesting, focused on affordances, where the shape and structure of the environment plays a role in perception and action.

[02:39:08] **Leanne Chukoskie**: Tim – love the line of thinking here. As you know, this makes a lot of sense in terms of the ability to produce of certain movements is often found correlated with the ability to recognize those types of movements.

[02:40:19] **Jordan Berg (NSF/ENG)**: Marc, thanks again for that look at the incredible capabilities being created for robots in the near future. In his earlier keynote, Dr. Holzer talked about the economics of using automation to complement or replace human workers.

My question to you is whether these two processes are, or should be, interdependent. That is, do the capabilities of state-of-the-art robots drive their use in the workplace? Or do the economics of the workplace drive the development of new robotic capabilities? It looked like there might be examples of both kinds in your talk (big Dog the former, Stretch the latter). Is this generally a tightly integrated cycle? If not, should it be?

[02:42:37] **Marc Raibert**: I think companies usually let the economics of the workplace drive what technology gets developed. While academic researchers and Institutes think further out about what technology might be possible and opens the door for new ways of doing things.

[02:45:53] Chris Callison-Burch: 😊

[02:46:09] Balakrishnan Prabhakaran: @ Libby: If they are paid, will moderators stay?

[02:46:22] Craig Woolsey: Really interesting work on content moderation.

[02:46:58] Saiph Savage: Great talk Professor Libby

[02:47:06] Libby Hemphill: Volunteering literature suggest no, they wouldn't stay, because their motivations are not economic. But payment might work for some.

[02:47:29] Libby Hemphill: Thank you, Craig, and Saiph!

[02:47:37] Marian Chertow: What is “augmented ban appeal?”

[02:49:39] Libby Hemphill: On Reddit, “ban” means that a user has been denied access to a community—they aren't allowed to post anymore. “Appeal” refers to the common practice among banned user to beg their way back into the community. The appeal process is manual—it’s like an email thread between banned users and moderators. “Augmented ban appeal” uses AI to handle some of the mundane and routine parts of that communication process.

[02:50:47] Libby Hemphill: Our system recognizes that a ban is being appealed, collects standard info from the user appealing a ban, and shares structured info with mods. Our system does not make suggestions about the output of the appeal.

[03:00:03] Saptarshi Purkayastha: Berk, my question is to you when thinking about sorting trash. When new trash is shown, humans can forget what something looks like when it wasn't trash, and so it can easily classify something as trash. Humans are great at forgetting things. How does AI forget things, instead of learning only new things? Particularly, when things are not used humans can forget things, and can AI demonstrate that it forgets the appropriate things.

[03:00:06] Wei Zhao: Robots and AI can be so useful and helpful. But AI can be too smart and powerful. For example, AI has defeated the best players in various chess games for quite a while, and recently some claim that AI now has a “soul.” So, will AI dominate or threaten the existence of human beings in the future? And how can we avoid or minimize such huge risks? I don’t know if the questions are fair to our panelists. But I just like to get some ideas from experts. Thanks!

[03:06:55] Roger Bohn: Marc's robots should have deliberate mistake routines. Falls etc. (Charlie Chaplin)



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June 28, 2022 | 1:00-4:00 p.m. EST

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Chat Links and History

Links from Chat History		
<i>Participant</i>	<i>Topic</i>	<i>Link</i>
Karthik Ramani	Nick Bloom's research indicating remote workers do not necessarily "work extra instead of commuting", it's a combination of working more and taking more breaks for household items (chores, picking up children, etc.)	<a href="https://fortune.com/2022/02/01/remote-work-saves-six-hours-per-week-commuting-hybrid-nick-bloom-stanford/#:~:text=%E2%80%9CYou%20can%20see%20people%20spend,gym%2C%20and%20seeing%20the%20dentist">https://fortune.com/2022/02/01/remote-work-saves-six-hours-per-week-commuting-hybrid-nick-bloom-stanford/#:~:text=%E2%80%9CYou%20can%20see%20people%20spend,gym%2C%20and%20seeing%20the%20dentist</a>
Karthik Ramani	<i>Why Working from Home Will Stick</i> , working paper co-authored by Nick Bloom, Jose Maria Barrero, and Steven Davis	<a href="https://www.nber.org/papers/w28731">https://www.nber.org/papers/w28731</a>
Karthik Ramani	<i>The Donut Effect of Covid-19 on Cities</i> , working paper co-authored by Nick Bloom and Arjun Ramani	<a href="https://www.nber.org/papers/w28876">https://www.nber.org/papers/w28876</a>
Thomas Shipley	<i>Learning from the COVID-19 Pandemic: How Faculty Experiences Can Prepare Us for Future System-Wide Disruption</i> , this research is heavily informed by the experience of geologists	<a href="https://digitalcommons.cwu.edu/geological_sciences/170/">https://digitalcommons.cwu.edu/geological_sciences/170/</a>
Saiph Savage	<i>Critical Theory and Interaction Design</i> , co-authored by Jeffrey Bardzell, Shaowen Bardzell, and Mark Blythe	<a href="https://mitpress.mit.edu/contributors/shaowen-bardzell">https://mitpress.mit.edu/contributors/shaowen-bardzell</a>
Mike Elliott	PI project posters	<a href="https://www.sri.com/the-future-of-work-at-the-human-technology-frontier/">https://www.sri.com/the-future-of-work-at-the-human-technology-frontier/</a>
Karthik Ramani	All ACM CHI, IEEE UIST, and CVPR publications as a result of FW-HTF	<a href="https://engineering.purdue.edu/cdesign/wp/category/main/2022/">https://engineering.purdue.edu/cdesign/wp/category/main/2022/</a>
Karthik Ramani	<i>Does the US tax code favor automation?</i> , co-authored by Daron Acemoglu, Andrea Manera, and Pascual Restrepo	<a href="https://www.brookings.edu/bpea-articles/does-the-u-s-tax-code-favor-automation/#:~:text=%E2%80%9CMost%20importantly%20%E2%80%A6%20we%20find%20that,optimal%2C%E2%80%9D%20the%20authors%20write.">https://www.brookings.edu/bpea-articles/does-the-u-s-tax-code-favor-automation/#:~:text=%E2%80%9CMost%20importantly%20%E2%80%A6%20we%20find%20that,optimal%2C%E2%80%9D%20the%20authors%20write.</a>
Karthik Ramani	<i>Harms of AI</i> , authored by Daron Acemoglu	<a href="https://scholar.google.com/citations?view_op=view_citation&amp;hl=en&amp;user=l9Or8EMAAAJ&amp;sortby=pubdate&amp;citation_for_view=l9Or8EMAAAJ:jgpk9vOjLEcC">https://scholar.google.com/citations?view_op=view_citation&amp;hl=en&amp;user=l9Or8EMAAAJ&amp;sortby=pubdate&amp;citation_for_view=l9Or8EMAAAJ:jgpk9vOjLEcC</a>

**[00:45:45] Jason Wiese:** This benefit of “working extra instead of commuting” doesn’t seem like it’s a good outcome of remote work – many people say that the commute gives them a chance to have a good transition between work and home...something that disappears when the commute is removed

**[00:46:50] Erin Brady:** seconding Jason! Same for the flexible work schedule, which can be beneficial for some folks but an issue for others if it encourages folks to work more during "off" hours.

**[00:47:58] Karthik Ramani:** Nick Bloom is a prime researcher (Stanford):  
<https://fortune.com/2022/02/01/remote-work-saves-six-hours-per-week-commuting-hybrid-nick-bloom-stanford/#:~:text=%E2%80%9CYou%20can%20see%20people%20spend,gym%2C%20and%20seeing%20the%20dentist.>

**[00:48:56] Karthik Ramani:** <https://www.nber.org/papers/w28731>

**[00:49:23] Karthik Ramani:** <https://www.nber.org/papers/w28876>

**[00:50:11] Cynthia Chen:** Seconding Jason. Positive utility has been identified for commuting and the ideal commute is 16 minutes according to works by Pat Mokhtarian.

**[00:51:11] Cynthia Chen:** second Erin as well: working at home mostly can be opportunity cost for some, especially for the young

**[00:53:18] Deb Donig:** I hope we don't lose track of the fact that remote work is possible, even with some potential downsides, demonstrated that many of these jobs are—and could have been for a long time—available for people with disabilities to perform; oftentimes those with disabilities have been denied opportunities because of the lack of a remote option. The pandemic showed that many of these jobs never needed to be prohibitive to those with disabilities

**[00:53:47] Thomas F. Shipley:** some work we did with geologists on this:  
[https://digitalcommons.cwu.edu/geological\\_sciences/170/](https://digitalcommons.cwu.edu/geological_sciences/170/)

**[00:54:08] Thomas F. Shipley:** challenges to instructors going to teaching virtual

**[00:54:42] Jason Wiese:** This is a great point Deb, totally agree. One catch is that this shifts the question to the accessibility of the software, which is unfortunately not uniformly good (but is addressable!)

**[00:56:21] Erin Brady:** +1 deb!

**[00:56:23] Cynthia Chen:** agree with Deb too: remote work can be particularly beneficial for some, e.g., those with disabilities or with very challenging family obligations.

**[00:57:33] Leanne Chukoskie:** This was one of our observations in terms of neurodiverse workers who experienced workplace anxiety—it was much lower if they could control their own work environments.

**[00:57:39] Tobias Lodemann:** I think early experiments in China with work from home had also shown that those who decide to come into office had considerably more promotions than those who stayed virtual, likely due to networking

**[01:01:07] Saptarshi Purkayastha:** Thank you for the presentations... I wanted to add that there are likely some professions where work cannot (or currently isn't) be remote, or at least the work

environments are not (nursing, surgery, etc.). Also, there are certain workers who are alienated by remote.... this goes beyond reskilling

**[01:01:35] Saiph Savage:** Thank you for the great presentations.

**[01:02:27] Saiph Savage:** I like the work of Dr. Shaowen Bardzell for thinking about remote work and our homes, especially designing for settings where the blurring of work-life boundaries happen but considering power structures and ethics of care. I have liked her framing for my research on designing for gig workers. You can read more about her work here:

Bardzell, Shaowen. "Through the "Cracks and Fissures" in the Smart Home to Ubiquitous Utopia." *Critical Theory and Interaction Design*. MIT Press, Cambridge, MA (2018).

<https://mitpress.mit.edu/contributors/shaowen-bardzell>

**[01:16:59] Mike (Zoom Support):** All posters can be found on the FW-HTF website:  
<https://www.sri.com/the-future-of-work-at-the-human-technology-frontier/>

**[02:10:52] Soumya Ray:** Could you clarify how "low-level" is defined? Thanks!

**[02:11:31] Soumya Ray:** I see. Thanks!

**[02:22:01] Leanne Chukoskie:** What might be the role of apprenticeships in this addressing this situation in terms of access?

**[02:28:44] Karthik Ramani:** <https://engineering.purdue.edu/cdesign/wp/category/main/2022/>

**[02:29:11] Karthik Ramani:** All our ACM CHI, IEEE UIST, and CVPR publications as a result of FW HTF is on our website.

**[02:33:11] Andrea Miller:** On upskilling/lifelong learning: My project team is internally debating whether we should be moving toward credentialing/certification (so workers can continually upskill and show their competencies in specific technologies) versus promoting higher ed (so workers have broadly applicable critical thinking skills and are equipped for lifelong learning). I'd love to hear the panelists' thoughts on whether one of these approaches is better

**[02:34:06] Saiph Savage:** Great talks! Could you share more information about how your virtual assistants decide what students should be visited? How do you overcome biases in decision making?

**[02:34:10] Soumya Ray:** What is the role of micro-credentials in future work? Maybe these are more practical/financially tractable than full college degrees?

**[02:36:37] Professor Donig:** I appreciate that these new technologies may help teachers. But the experience of many of us, in secondary education and in post-secondary education, is not that we need better technologies to do the work, but that fundamentally increased workload, administrative tasks developed by new technologies or by administrators who download new tasks onto faculty because of a ballooning number of new systems developed and deployed through technologies, means that the job is excessive in terms of time requirements, fundamentally no longer about teaching itself (Cal Newport's statistic, if I recall correctly, is that currently instructors spend 60% of their time on teaching and knowledge development, with 40% administrative tasks, email, and meetings), and very poor

compensation, opportunities for financial reward or upward mobility in the profession, and the growing alternative of other industries that do adequately compensate workers for their time and skills

**[02:37:26] Soumya Ray:** thank you!

**[02:37:29] Professor Donig:** I suppose my point is that the issues are educational policy issues, funding issues, and structural issues in the academy/educational sphere, that can't really be addressed by new technological innovations

**[02:39:43] Jason Wiese:** +1 Prof Donig! It's too easy to focus on the "technology" piece without first deeply understanding what needs exist and using that understanding to figure out what can be done to address those needs.

**[02:41:20] Saiph Savage:** +1 on Prof's Erickson's point

**[02:41:45] Krista Glazewski:** Professor Donig, definitely agree with your points about structural / policy concerns. Would like to make the point that the 2 classroom interventions are addressing a narrowly banded problem at the intersection of classroom orchestration / instructor facilitation + complex learning activity.

**[02:42:16] Krista Glazewski:** (full disclosure that I'm a collaborator on the I-ACT project)

**[02:43:36] Deb Donig:** I love your point, Professor Erickson. I hope that the observation extends not only to encouraging students to develop "soft" skills, but also universities to develop things like tenure lines for faculty who can teach those skills, commensurate and equitable pay and workloads for those workers for their colleagues in STEM, etc.

**[02:43:55] Andrea Miller:** +1

**[02:43:56] Ingrid Erickson:** Yes, I so agree!

**[02:46:22] Karthik Ramani:** <https://www.brookings.edu/bpea-articles/does-the-u-s-tax-code-favor-automation/#:~:text=%E2%80%9CMost%20importantly%20%E2%80%A6%20we%20find%20that,optima,%20the%20authors%20write>.

**[02:46:33] Karthik Ramani:**

[https://scholar.google.com/citations?view\\_op=view\\_citation&hl=en&user=I9Or8EMAAAJ&sortBy=pubdate&citation\\_for\\_view=I9Or8EMAAAJ:jgpk9vOjLEcC](https://scholar.google.com/citations?view_op=view_citation&hl=en&user=I9Or8EMAAAJ&sortBy=pubdate&citation_for_view=I9Or8EMAAAJ:jgpk9vOjLEcC)

**[03:26:58] Ingrid Erickson:** Thanks to all my small group interlocutors! Ping me directly at [imericks@syr.edu](mailto:imericks@syr.edu) to continue the conversation