Paradoxes in Producing the Future of Farm Work: Anticipating Social Impact through the Lens of Early Adopters





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Outline

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- Our Projects
- Research Questions
- Approach
- Results
- Discussion
- Moving Forward

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Cornell Musgrave - Northern Corn Leaf Blight Research (10/2018)



FarmBeats at Cornell: TVWS Spectrum Analysis (09/2020)



FarmBeats at Cornell: Orchard Deployment (10/2020 - Present)





Overarching Question

How do researchers and practitioners visualize and create the future of farm work through extensions of FarmBeats?

Societal Impact of Farm Networking















https://sites.coecis.cornell.edu/farmnetworkingimpact

Approach

Reflections on 3 years of deployment experience Interview with other lead FarmBeats users



Research Questions

- What are the **successes**, **frustrations**, and **assumptions** in deploying/modifying/extending FarmBeats?
- How does the early user community shape the **current** and **future adoption** of DA platforms like FarmBeats?
- How do early adopters frame their **perceptions** of, and ultimately, **shape the future** of farming?

Results: Tensions between Visions and Grunt Work

P5: "FarmBeats is one of the first products that actually delivers on the idea that you install it, you put batteries in it, you go home and see that data"

P1: "For the first week, I was connecting into the debug pins, rather than the actual pins to communicate to it. And I was pulling my hair like why I'm not able to read anything when I send to find out the version command"

P5: "One is I guess the quality of the documentation and given that it still is kind of a Microsoft research project... I'm not necessarily knocking it, but we did spend quite a bit of time realizing that, 'Wow there's actually a couple of versions of this manual and there's some key things that are different in the two or three versions'. You piece them together and then it's fine"

Results: Early Woes and Social Impact

P1: "But just a heads-up I would like to give you is that we are still trying to set up the system and have it working without any issues. Due to COVID-19, like, we were planning to get everything set up by end of May, but due to some logistical issues, we didn't get all the components, the sensor [boxes] themselves, and everything..."

P3: "I think they are probably things that every user would probably go through. It was a matter of time... I don't view these as fundamental problems at all, they were just... minor logistics, but they took time"

Results: The Future will be Born out of Compromise

P2: "Maybe this partner need[s] to adjust things in the hardware part... or they need, they, I mean FarmBeats or Microsoft needs to adjust something in their web platform to talk with a specific sensor that they don't have in the list"

Discussion: Paradoxes in Creating The Future of Farm Work

- 1. Paradox of material resistance
- 2. Paradox of resource allocation
- 3. Paradox of labor

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Discussion: The Material Resistance Paradox





Discussion: Implications

- 1. Technology undergoes evolution (1)
 - Plug-and-play deters researcher/farmer tinkering
- 2. Social impact sidelined until full functional systems
 - The future will be discussed in the future
- 3. With a functional system, challenges are immaterial (2)
 - Any challenges overcome remain in 'future work' land

1. Jiang *et. al.* (2018). Crowdsourcing Rural Networking Maintenance and Repair via Network Messaging. (CHI '18) 2. Jenna Burrell. 2018. Thinking relationally about digital inequality in rural regions of the US. *First Monday* 23, 6 (2018)

Discussion: Recommendations

- 1. Technology undergoes evolution
 - Design for average while making tweaking accessible
- 2. Social impact sidelined until full functional systems
 - Embrace social impact discussions early in design
- 3. With a functional system, challenges are immaterial
 - Engage rural communities on repair challenges

Societal Impact of Farm Networking















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Moving Forward

Gloire Rubambiza *et al.* (2021). "Paradoxes in Producing the Future of Farm Work: Anticipating Social Impact through the Lens of Early Adopters", *Automation Experience in the Workplace*, CHI '21, To Appear

Ongoing analysis with a target for CHI '22 Conference



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