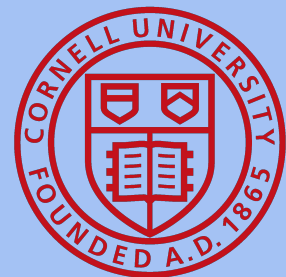
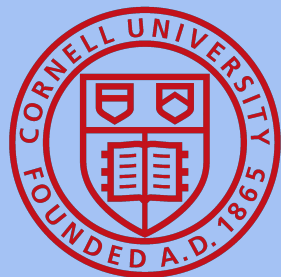


Paradoxes in Producing the Future of Farm Work: Anticipating Social Impact through the Lens of Early Adopters



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Outline

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

Introduction: The Digital Agriculture (DA) Narrative

“Down a **dusty road** west of Napier, a screeching **robotic noise** reverberates through **apple orchards** ... The robot could have major ramifications for New Zealand’s fruit-picking industry, which nearly every year in recent memory has experienced a seasonal labor shortage, to the dismay of growers.”

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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?

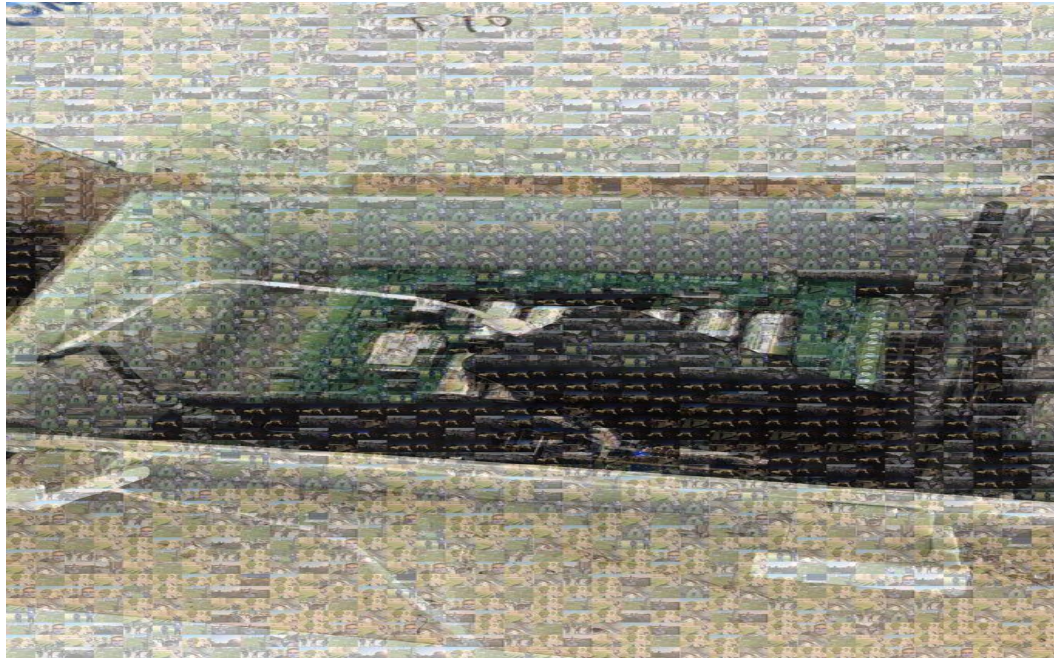
Societal Impact of Farm Networking



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

Approach

1. Reflections on 3 years of deployment experience
2. 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

Thank you



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