

DIGITAL AGRICULTURE PILOT PROGRAM

Background

Andrea and Craig held a teleconference with Jose Martinez, Professor and Associate Director in the School of Electrical and Computer Engineering. He is also on the executive committee of Cornell's digital agriculture initiative. Our goal was to better understand Cornell's existing cross departmental activities in the agricultural engineering area and discuss how the ECC Bioengineering task force could work with affiliated faculty to strengthen Cornell's approach to the field. Jose described the cross college initiative which was formally started two years ago with a goal of accessing seed funding. The group was initially funded by the Provost, and was named as one of Cornell's eight areas of "radical collaboration". The initiative has formed an executive committee and hired a managing director to oversee activities. The executive committee meets every Friday to share ideas.

Currently there are a broad set of activities ongoing within the digital agriculture collaboration. Many technologies across the research fields at Cornell have applications in digital agriculture. The mission of the radical collaboration is to bring these technologies together to yield new approaches to improving plant and livestock based agriculture. The collaboration has created a vibrant set of activities including events for students and industry. Multiple research initiatives are also underway, including:

- Increasing the nutritional value of plants
- Digitization of the farm
- Multimodal sensor deployment

One of the unique aspects of digital agriculture is the need to focus on the social impact of their work to understand early the needs of the constituents as well as the means for deploying the tools they are developing. For example, while digital technologies may be readily adapted by industrial farms, in the US, around 90% of arable land is farmed by small farmers with different access and different economics which must be considered. Solutions will likely need to incorporate existing systems like Cornell's agricultural extension service to be successful. Similar challenges to adoption exist globally.

Problem Statement

While the digital agriculture radical collaboration is off to a good start, more is needed to ensure success. Stronger industry ties which yield both potential funding as well as research collaborations are needed. Jose pointed to more mature initiatives at the University of Arizona and the University of Illinois, particularly noting the Illinois initiative which has industry scientists take up residence at the university for a period of time. Cornell does have relationships with Microsoft which are bringing capital into the University, but Jose sees much broader opportunity. Another challenge is to better understand how to broadly capture the value of their research and maximize its social impact. Different from other pilots we are exploring, where the goal may be an industrial commercial collaboration, the optimal path here may be partnerships with government, NGOs, or socially focused philanthropy organizations such as Rockefeller or Gates.

Proposed Pilot Project

It is proposed that a sub-team of the ECC bioengineering task force and a group of faculty form a working team to define a strategy to build on the considerable success of efforts in digital agriculture to date to help elevate and secure the emerging leadership position Cornell has. The pilot effort is envisioned to have two significant thrusts. The first is to help refine the approach to industry and large philanthropic collaborations for the digital agriculture team. The second is help the digital agriculture team consider what is needed to better work with the broad community potentially impacted by their work to ensure strong feedback loops and ensure maximum impact. This work should culminate with a plan which can be presented to the College and University, as well as provide a framework for, and where possible introductions to, industry collaborations. Finally the team should put in place metrics and check-ins for tracking the implementation of their plan.