

Title: Software-Defined Farm

Abstract:

In this session, we will discuss the design and implementation of a software-defined farm (SDF), a highly versatile system that manages crop and dairy farms holistically, using a hybrid mechanistic + data-driven systems modeling approach. A collection of inexpensive sensors and robots, connected through an open Internet-of-Things architecture for low-power computation and communication, allows a SDF to collect and act on large-scale farm data streams. Simultaneously, a SDF can serve as a rapid phenotyping platform for a high-throughput, cloud-resident bioinformatics pipeline, which can be used to improve upon SDF' farm modeling, and to drive improved farming practices.

Bio:

Hakim Weatherspoon is an Associate Professor in the Department of Computer Science at Cornell University and Associate Director for the Cornell Initiative for Digital Agriculture. His research interests cover various aspects of fault-tolerance, reliability, security, and performance of internet-scale data systems such as cloud and distributed systems. Weatherspoon received his Bachelors from the University of Washington and PhD from University of California, Berkeley. Weatherspoon has received awards for his many contributions, including an the University of Washington, Allen School of Computer Science and Engineering, Alumni Achievement Award; Alfred P. Sloan Research Fellowship; National Science Foundation CAREER Award; and a Kavli Fellowship from the National Academy of Sciences. He serves as Vice President of the USENIX Board of Directors and is the Founder, Steering Committee, and General Chair for the ACM Symposium on Cloud Computing. Hakim has also been recognized for his work to promote diversity, earning Cornell's Zellman Warhaft Commitment to Diversity Award. Since 2011, he has organized the annual SoNIC Summer Research Workshop to help prepare between students from underrepresented groups to pursue their Ph.D. in computer science.