Environmental Engineering & Sciences

Department of Civil and Environmental Engineering
CEE 595AG Seminar

Friday, October 13, 2023 | 10:00 – 10:50 a.m. CST | 2311 Yeh Center

The Digital Transformation of Agriculture: Advancing Productivity towards a Circular Bioeconomy

Over the past 150 years, agriculture has witnessed a significant shift with the mechanization of machine systems aimed at enhancing productivity and convenience. The advent of precision agriculture technologies since the 1990s has acted as a pivotal point, gradually evolving into a catalyst for smart agriculture and further improving production practices. The integration of machine electronics, automation, precision guidance, communication, and cloud computing has not only increased machine productivity but also brought about notable enhancements in worksite productivity. Presently, autonomous machine systems are emerging as the next frontier, offering diverse pathways for future productivity and convenience while addressing the pressing need for sustainability and decarbonization.

This presentation aims to review the fundamental aspects of digital technologies that currently deliver value in agriculture and explore the research opportunities lying ahead in the journey from automation to autonomy of large-scale production systems. The focus will be on how these advancements contribute to the creation of a circular bioeconomy. By leveraging digital transformation, the agriculture sector can foster sustainable practices, optimize resource utilization, and enhance overall productivity, paving the way for a more circular and environmentally conscious future.

John Reid, PhD
Research Professor
UIUC Ag & Bio Engineering, and Electrical & Computer Engineering

Dr. Reid is Research Professor in Computer Science, Ag & Bio Engineering, and Electrical and Computer Engineering since Fall 2022 and is an affiliate in the Center for Digital Agriculture. Reid has more than 35 years of highly accomplished technology leadership experience in industry and academia. From 1986-2000, he served on the faculty at the University of Illinois where his research focused on sensing, automation, and control of food and agricultural systems. He then spent 19 years with Deere and Company where initiated the development of enterprise field robotics capabilities. He has extensive experience in leading technology transition into practice having served as Director, Enterprise Product Innovation and Technology for 14 years. In 2017 he was recognized as John Deere Technical Fellow for his contributions to innovation. From 2020-2022, he was Vice President of Enterprise Technologies for Brunswick Corporation, an industry leader in recreational marine products, solutions, and services.

Reid received his B.S. and M.S. degrees in Agricultural Engineering from Virginia Tech. Reid received his PhD in Agricultural Engineering from Texas A&M University where his dissertation topic was automatic tractor guidance via computer vision. His research interests have broadly focused on advancing agricultural and biological systems through advanced sensing, automation, and control. He and his collaborators have produced more than 30 patents in these research areas.

Dr. Reid's external leadership includes Chairmanship of the Innovation Research Interchange (2018-2019), Board of Directors of Fraunhofer USA (2013-2022), and a full member of the Club of Bologna(since 2002), a global task force for the development of strategies for agricultural mechanization. Awards include University of Illinois University Scholar (1995), ASABE Fellow (2004), John Deere Fellow (2017), and Virginia Tech Academy of Engineering Excellence (2020). Dr. Reid was elected to the National Academy of Engineering in 2019 for contributions to automation in agriculture. Dr. Reid was recently named as the founding Chair of the ASABE Circular Bioeconomy Systems Institute created to catalyze the transition of agriculture to a circular bioeconomy.