Digital Twin for Sustainable Cropping Systems: Multi-scale Modeling, Sensing, and Model-data Integration

The global cropping systems need to be optimized to meet several sustainable development goals under climate change and land use intensification. Synergy of multi-facet outcomes, including agricultural production and other ecosystem services, is a key towards sustainable cropping systems. Digital twin offers a feasible and effective way to optimize the cropping systems and thus to better inform the decision making in managing the cropping systems. In this talk, I will present my previous research experience related to multi-scale cropping systems modeling, sensing, and model-data integration, which are the backbones in building a digital twin of the cropping systems. I will also discuss my vision of building a top-notch research and education program related to digital twin for sustainable cropping systems with the ultimate goal of optimizing the management of each individual land parcel on this planet for the wellbeing of human society.

About Dr. Bin Peng

Dr. Bin Peng is now a Research Assistant Professor at Department of Natural Resources and Environmental Sciences (NRES) and Senior Research Scientist at Institute for Sustainability, Energy, and Environment (ISEE), University of Illinois at Urbana-Champaign (UIUC). Dr. Peng’s primary research interests are computational and process-based modeling (hydrological, crop, ecosystem, and earth system modeling), remote sensing, model-data integration, geospatial big data, and artificial intelligence for sustainable and digital agriculture. He has published over 50 peer-reviewed papers in leading journals and has been PI or co-PI for several research projects from USDA and NASA. Dr. Peng serves as associate editors for Agronomy Journal, the flagship journal of American Society of Agronomy, and Frontiers in Big Data.