BIOLOGICAL SYSTEMS ENGINEERING

DEGREES/MAJORS, DOCTORAL MINORS, GRADUATE/PROFESSIONAL CERTIFICATES

Biological Systems Engineering, MS (http://guide.wisc.edu/graduate/biological-systems-engineering/biological-systems-engineering-ms/)

Biological Systems Engineering, PhD (http://guide.wisc.edu/graduate/biological-systems-engineering/biological-systems-engineering-phd/)

PEOPLE

FACULTY

Dr. Neslihan Akdeniz
Developing climate-smart technologies to improve the profitability of livestock producers; finding alternative ways of utilizing co-products of animal agriculture; assessing air quality inside livestock buildings for improved occupational health; exploring strategies to minimize the impacts of foreign animal diseases; organizing extension activities to deliver on-farm research knowledge. I make every attempt to include graduate students in my extension program to enhance their networking opportunities.

Dr. Robert Anex
Biological systems analysis and assessment; life cycle assessment; techno-economic analysis

Dr. Christopher Choi
Heat and mass transfer and computational fluid dynamics (CFD); controlled environments – livestock housing and greenhouse; water distribution system modeling and water quality; experimental methods, data acquisition, and systems optimization in biological systems

Dr. Matthew Digman
Impact of autonomy on agricultural machine forms; application of sensors to predict chemical and physical properties of agricultural materials

Dr. Sundaram Gunasekaran
Engineering properties and quality of food and biomaterials; rheology of food and other macromolecular systems and hydrogels; structure function relationships in foods; novel and value-added bioprocess engineering

Dr. Margaret Kalcic
Watershed modeling; watershed management; conservation practice effectiveness; agricultural hydrology; nutrient transport; water quality; land use change; climate change

Dr. K.G. Karthikeyan
Fate, removal, and transport of nutrients and contaminants in surface/subsurface environments; water quality chemistry; land application of agricultural/municipal/industrial waste; applications of GIS/water quality models; physical and chemical processes for water, wastewater, and waste treatment; soil decontamination

Dr. Brian Luck
Machine management, variable rate technology; agricultural “Big Data” management; remote sensing

Dr. Mallika Nocco
Evapotranspiration; regenerative irrigation; deficit irrigation; drought resilience; managed aquifer recharge; precision agriculture; transpiration & distribution uniformity; soil-plant-water relations; feedbacks between irrigation and climate; aerial remote sensing; soil and water conservation; soil health; agrohydrology; science communication and extension

Dr. Xuejun Pan
Development of innovative biorefining process for producing energy, fuels, chemicals, and materials from renewable resources (biomass) with specific research interests in pretreatment and fractionation of lignocellulosic biomass for bioconversion to chemicals and fuels; enzymatic and non-enzymatic saccharification of cellulose and lignocellulose; catalytic conversion of lignocellulose to drop-in hydrocarbon fuel; platform chemicals from biomass; functional materials from cellulose, lignin, hemicellulose, and extractives.

Dr. Douglas Reinemann
Biomechanics of machine milking; sustainable development of bio-energy systems; renewable energy technology and policy; biosensors for milk quality analysis; effects of the electrical environment on farm animals; integral thought and philosophy

Dr. Troy Runge
Bioenergy – biomass composition impact on bioprocessing systems, including anaerobic digestion, combustion, gasification, and catalysis; Biomaterials – pulp, paper, bio-based chemicals, cellulose composites and nonwoven structures

Dr. John Shutske
Safety engineering and education related to occupational and public health hazards in agricultural and food systems; multidisciplinary approaches for solving complex risk-related problems; design and evaluation of sensors and control systems to mitigate environmental and machine risks; risk communication methods and limitations.

Dr. Paul Stoy
Surface-atmosphere exchange; ecosystem ecology; natural resource management; water resource management; remote sensing.

Dr. Anita Thompson
Hydrologic implications of land use change; urban hydrology and stormwater management; water quality impacts of biofuel crop production; cold regions hydrology; hydrologic modeling; sediment, nutrient and pathogen transport; polyacrylamides and biosolids for fertilizer and erosion management

Dr. Zhou Zhang
Multi-source remote sensing data fusion (e.g., hyperspectral, LiDAR, RGB); machine learning for high dimensional data analysis; UAV-based imaging platform developments for precision agriculture; crop yield
prediction using remote sensing and machine learning; high-throughput image-based plant phenotyping.

**AFFILIATE FACULTY**
Dr. Grace Bultail - Nelson Institute
Dr. Joao Dorea - Dept. of Animal and Dairy Sciences
Dr. Awad Hanna - Dept. of Civil Engineering
Dr. Richard Hartel - Dept. of Food Engineering
Dr. John Ralph - Dept. of Biochemistry