Assistant Professor
Robotics, Sensors, and Manufacturing in Environmental Management and
Sustainable Agriculture
Department of Bioproducts and Biosystems Engineering
College of Food, Agricultural and Natural Resource Sciences (CFANS)
College of Science and Engineering (CSE)
University of Minnesota

The University of Minnesota's MnDRIVE initiative on Robotics, Sensors, and Manufacturing envisions the University of Minnesota playing an integral part in helping the state emerge as a robotics and automation leader, and as a contributor to the renaissance of domestic manufacturing by providing critical innovations, education, and training in pertinent disciplines. To further enhance Minnesota's competitiveness at this critical time in the history of the robotics industry and advancements in manufacturing, the University of Minnesota is proposing to augment its existing strengths in teaching and research in areas of relevance to the robotics, sensors, and manufacturing. The Department of BBE (www.bbe.umn.edu) is an internationally renowned academic unit with the core mission of sustainable use of renewable, agricultural and natural resources and enhancement of the environment. The Department of Bioproducts and Biosystems Engineering (BBE) is seeking a tenure-track faculty position in the areas of robotics and sensors for environmental management for sustainable agriculture at the level of Assistant Professor with research and teaching responsibilities.

Agriculture is an ideal industry for autonomous or semi-autonomous robotic systems because it involves many processes that are labor intensive, repetitious and rely on information that computers can interpret and respond to. More efficient management of agricultural inputs with agricultural robotics will lead to increased crop production and improved quality as well as improved soil, water and air quality. The required increases in agriculture production to meet the growing global demand for food and fiber will come at a price in the form of degraded soil, water and other natural resources, unless innovative ways are developed for improving the efficient use of resources. Precision agriculture is an important technology to optimize the use of water, nutrients and pesticides at the field scale. However implementation of sustainable agricultural practices and optimal environmental management at larger, watershed scale requires consideration of the properties and response of streams, lakes, wetlands and other off-agricultural field features. Innovative methods based on improved sensors and robotics technology are needed to collect necessary data at relevant time and space scales to understand the system, to reduce the chance of systematic errors in measurements and to enable more effective control of agricultural inputs and improve the efficiency of production.

Research: The candidate is expected to develop an internationally recognized research program in the area of sensing and robotics in sustainable agriculture and environmental management. Emphasis areas in research are expected to include: the design of systems for dynamic or spatial measurement of water quality variables in agricultural run-off, streams and lakes, drones for inspection of damage after significant flooding events, design and management of water release systems in agricultural ditches and constructed wetlands, monitoring of soil moisture and water table depth, temperature and snow depth and frost depth , direct measurement of ET, measurement of plant characteristics including location, species, canopy cover, and height, identification of areas with invasive species and noxious weeds, habitat assessment and distribution of woody debris in stream channels, and measurement of greenhouse gas emissions. A successful candidate will be expected to develop research in areas that supports Minnesota agriculture and natural resources. Collaborative research with various colleges and departments across the University including CFANS (i.e. Soil Science, Agronomy, Plant Pathology, and Animal Science) CBS (i.e. Ecology) and the College of Science and Engineering is encouraged.

Teaching: The teaching component of this position will include the development of basic and applied engineering courses (UG and GRAD) and their applications. The teaching may be lecture or e-based learning. Involvement in University Robotics team activities is encouraged. A demonstrated commitment to excellence in undergraduate and/or graduate teaching and advising is essential. This position is also expected to strive for excellence in academic advising for undergraduate and graduate students as a vital component of student development.

Qualifications: Applicants must have a demonstrated excellent academic/industry record, and potential to be a world class leader in research and have a commitment to education.

Required: A Ph.D. from a world-class University in an engineering discipline, with an agricultural, environmental, biological, ecological, electrical, or mechanical background.

Preferred: Research or industrial experience in aerial or terrestrial sensing or robotics with an interest in agricultural and/or environmental applications. Preference will be given to candidates with a demonstrated and relevant publication record or industrial experience; evidence of interdisciplinary research teamwork, and strong English communication skills.

Application Instructions

Please apply online via the University of Minnesota Employment System: employment.umn.edu/applicants/Central?quickFind=127357

Applications should include a cover letter referencing the BBE Robotics, Sensors and Manufacturing faculty position, detailed curriculum vitae, statements on teaching and

research interests, and a list of three references with contact information (including email addresses). Review of applications will begin March 23, 2015 and continue until the position is filled. A successful candidate may be appointed as early as August 30, 2015.

During the interview process, applicants will be asked to describe their commitment, experience and approach to teaching and working with students, colleagues and constituents from diverse populations.

Any offer of employment is contingent upon the successful completion of a background check.

The University of Minnesota provides equal access to and opportunity in its programs, facilities, and employment without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. As an institution committed to demonstrating excellence through diversity, the College of Food, Agricultural and Natural Resource Sciences and the University are committed to hiring a diverse faculty and staff, and strongly encourage candidates from historically underrepresented groups to apply. We welcome you to visit our college's Diversity and Inclusion web page at: http://www.cfans.umn.edu/diversity/