

## Brian L. Steward

Professor of Agricultural and Biosystems Engineering  
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### Education

South Dakota State University	Electrical Engineering	B.S., 1989
South Dakota State University	Electrical Engineering	M.S., 1994
University of Illinois Urbana-Champaign	Agricultural Engineering	Ph.D., 1999

### Professional Experience

2012-present	Professor, Agricultural and Biosystems Engineering Department, Iowa State University
2005–2012	Associate Professor, Agricultural and Biosystems Engineering Department, Iowa State University
2009–2010	Fulbright Visiting Professor, Departamento de Engenharia Agrícola, Universidade Federal de Viçosa
1999–2005	Assistant Professor, Agricultural and Biosystems Engineering Department, Iowa State University
1998–1999	Research Assistant, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign
1995–1998	USDA Research Fellow, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign
1994–1995	Foreign Expert, Changsha Electric Power University, Changsha, Hunan, People's Republic of China
1989–1994	Design Engineer, Flow Controls Division, Raven Industries Inc., Sioux Falls, South Dakota

### Scholarly Activities

Dr. Steward's research program focuses on agricultural machinery systems including field automation and sensing at the machine-soil-plant interface and virtual design and testing. He teaches courses in the areas of fluid power engineering, dynamical systems modeling, simulation, and controls, and sustainable engineering. Dr. Steward is professor-in-charge of the Danfoss Fluid Power Teaching Laboratory and the Off-Highway Vehicle Chassis Dynamometer Laboratory. He leads the fluid power educational programs at ISU, training approximately 200 students per year in fluid power. He also teaches hydraulics short courses to practicing engineers. He has international experience living and teaching in P.R. China and in Brazil as a Fulbright scholar. Dr. Steward has served as the professor-in-charge of international programs in the ABE department as the faculty coordinator of a student exchange program between ISU and Federal University of Viçosa, Brazil.

### Selected Honors and Awards

- 2020 Superior Paper Award, American Society of Agricultural and Biological Engineers. 7/15/2020
- Honorary membership in Alpha Epsilon, Agricultural Engineering Honor Society 4/15/2015
- ISU College of Agriculture and Life Sciences Mid-Career Achievement in Research Award, Presented at the CALS Spring University Convocation 1/17/2013
- ISU College of Agricultural and Life Sciences Outstanding Achievement in International Agriculture Award, Presented at the CALS Spring University Convocation 2/7/2011
- Iowa State University Louis Thompson Distinguished Undergraduate Teacher Award 9/20/2010
- Fulbright Scholar at Universidade Federal de Viçosa, Viçosa, Minas Gerias, Brasil 3/4/2009

## Selected Publications

Over 245 technical publications/presentations: 53 refereed journal articles, 61 invited talks, 30 conference proceedings, 86 technical papers and presentations, 25 final project reports, and 5 book chapters including the following selected journal articles:

Anderson, E. and **B. L. Steward**. 2021. Reinforcement learning for active noise control in a hydraulic system. *ASME Journal of Dynamic Systems, Measurement and Control* 143(6).

Souza, A. M, S. J. Birrell, and **B. L. Steward**. 2020. The dielectric properties of switchgrass and corn stover at the radio frequency range. *Transactions of the ASABE* 64(1): 243-252.

Kshetri, S., **B. L. Steward**, J.J. Jiken, L. Tang, and M. Tekeste. 2019. Investigating effects of interaction of single tine and rotating tine mechanism with soil on weeding performance using simulated weeds. *Transactions of the ASABE* 62(5): 1283-1291.

Gai, J., L. Tang, and **B. L. Steward**. 2020. Automated crop plant detection based on the fusion of color and depth images for robotic weed control. *Journal of Field Robotics* 37(1): 35-52.

Schramm, M. W., H. M. Hanna, M. J. Darr, and S. J. Hoff, and **B. L. Steward**. 2019. Sub-second wind velocity changes one meter above the ground. *Applied Engineering in Agriculture* 35(5): 697-704.

Mapoka, K. O. M., S. J. Birrell, M. Tekeste, and **B. L. Steward**. 2019. Using gprMax to model ground penetrating radar (GPR) to locate agricultural corn seed as an attempt to measure planting depth. *Transactions of the ASABE* 62(3): 673-686. doi: 10.13031/trans.12809

Du, Y., M. C. Dorneich, and **B. L. Steward**. 2019. Development of a learning capability in virtual operator models. *SAE International Journal of Commercial Vehicles* 12(2). doi.org/10.4271/02-12-02-0009.

Du, Y., M. C. Dorneich, and **B. L. Steward**. 2018. Modeling expertise and adaptability in virtual operator models. *Automation in Construction* 90: 223-234. <https://doi.org/10.1016/j.autcon.2018.02.030>.

Hanna, H. M., **B. L. Steward**, and K. A. Rosentrater. 2018. Evaluating row cover establishment systems for cantaloupe and summer squash. *Applied Engineering in Agriculture*. 34(2):355-364. <https://doi.org/10.13031/aea.12217>

Kshetri, S., **B. L. Steward**, and S. J. Birrell. 2018. Dielectric spectroscopic sensing of fine liquid droplets in an airstream. *International Journal of Fluid Power*. 19(1): 42-48. dx.doi.org/10.1080/14399776.2017.1376999

Sharma, B., **B. L. Steward**, S. K. Ong, and F. E. Miguez. 2017. Evaluation of teaching approach and students' learning in an interdisciplinary sustainable engineering course. *Journal of Cleaner Production* 142 (4): 4032-4040. dx.doi.org/10.1016/j.jclepro.2016.10.046

Kshetri, S., **B. L. Steward**, and S. J. Birrell. 2017. Dielectric spectroscopic sensor for particle contaminant detection in hydraulic fluids. *International Journal of Fluid Power*: 18(1): 29-37. dx.doi.org/10.1080/14399776.2016.1210422

Du, Y., M. C. Dorneich, and **B. L. Steward**. 2016. The development of a virtual operator modeling method for excavator trenching. *Automation in Construction*. 70(October):14-25. doi: 10.1016/j.autcon.2016. 06.013

Felizardo, K. R., H. V. Mercaldi, P. E. Cruvinel, V. A. Oliveira, and **B. L. Steward**. 2016. Modeling and model validation of a chemical injection sprayer system. *Applied Engineering in Agriculture*.32(3): 285-297.

## Contracts and Grants and Gifts

Principal investigator (PI), Co-PI or collaborator of more than \$6.9 million in grants and contracts and over \$2.9 million in gifts for research and education projects.