Nuwan K. Wijewardane

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Education

University of Nebraska-Lincoln **USA**
PhD in Biological Engineering, GPA: 4.0/4.0 *August 2019*

University of Nebraska-Lincoln **USA**
MS in Agricultural and Biological Systems Engineering, GPA: 4.0/4.0 *August 2016*

University of Peradeniya **Sri Lanka**
MSc in Agricultural and Biosystems Engineering, GPA: 3.82/4.0 *January 2013*

University of Peradeniya **Sri Lanka**
BSc in Agricultural Technology and Management, GPA: 3.75/4.0 *September 2010*
First Class Honours

Experience Record

Agricultural and Biological Engineering, Mississippi State University **USA**
Assistant Professor *March 2021 - Present*

Biological Systems Engineering, University of Nebraska-Lincoln **USA**
Postdoctoral Research Associate *August 2019 - February 2021*

Research Grants

- USDA-National Institute of Food and Agriculture. September 9, 2022 - September 14, 2026. "CleanSEED: A project to ensure the sustainability of U.S. sweet potato seed programs" (Co-PI). USDA-NRCS Award #: 2022-51181-38329
- USDA-Agricultural Marketing Service. March 31, 2022 - March 30, 2025. "Advancing Optical Technologies for Enhanced Quality Evaluation, Grading and Sorting of Sweetpotatoes" (Co-PI). USDA-NRCS Award #: AM21SCMPMS1010
- USDA-NRCS-Soil Science Collaborative Research. August 17, 2021 - September 29, 2024. "Use of Mid-infrared Spectroscopy for Hydrological Soil Property Estimation in Mississippi and Texas" (PI). USDA-NRCS Award #: NR213A750025C003

PhD/MS students

Yasas Gamagedara
PhD *January 2022 - December 2024*

Amarasinghe Arachchige Praveen Shalika Amarasinghe
PhD *January 2023 - December 2026*

Francis Hettige Chamika Anuradha Silva
MS *January 2022 - December 2023*

Caleb Whatley
MS *May 2022 - May 2024*

Research Experience

Biological Systems Engineering, University of Nebraska-Lincoln **USA**
Post-doctoral Research Associate *August 2019 - February 2021*
Research project: High resolution vertical soil property sensing and 3D soil property mapping at the field scale (PI: Dr. Yufeng Ge).

Biological Systems Engineering, University of Nebraska-Lincoln **USA**
Graduate Research Assistant *Fall 2016 - Summer 2019*
Research project: Design and Development of a Multi-sensor Soil Penetrometer for High Resolution Vertical Sensing of Soil Properties (Advisor: Dr. Yufeng Ge).

Biological Systems Engineering, University of Nebraska-Lincoln **USA**
Graduate Research Assistant *Fall 2014 - Summer 2016*
MS Thesis: Using A VNIR Spectral Library to Model Soil C and total Nitrogen content (Advisor: Dr. Yufeng Ge).

Civil Engineering, Faculty of Engineering, University of Peradeniya **Sri Lanka**
Research Assistant in the SATREPS project *2011 - 2012*
Research project: Clustering of Dumpsites in Sri Lanka Based on Waste Characteristics (Advisor: Dr. MIM Mowjood).

Agricultural Engineering, Faculty of Agriculture, University of Peradeniya **Sri Lanka**
Undergraduate reserach *2010*
Research project: Design and Development of a Tea Fermentation Detector (Advisor: Dr. KSP Amaratunga).

Peer Reviewed Journal Articles

Bheemanahalli, R., Ramamoorthy, P., Poudel, S., Samiappan, S., **Wijewardane, N.K.**, & Reddy, K. R. (2022). Effects of drought and heat stresses during reproductive stage on pollen germination, yield, and leaf reflectance properties in maize (Zea mays L.) *Plant Direct*, *6*, e434. https://doi.org/10.1002/pld3.434

Ge, Y., Morgan, C. L. S., & **Wijewardane, N.K.** (2019). Visible and Near-Infrared Reflectance Spectroscopy Analysis of Soils. *Methods of Soil Analysis*, *4*. https://doi.org/10.2136/msa2017.0040

Grzybowski, M., **Wijewardane, N.K.**, Atefi, A., Ge, Y., & Schnable, J. C. (2021). Hyperspectral reflectance-based phenotyping for quantitative genetics in crops: Progress and challenges. *Plant Communications*, *2*(4), 100209. https://doi.org/https://doi.org/10.1016/j.xplc.2021.100209

Grzybowski, M. W., Zwiener, M., Jin, H., **Wijewardane, N.K.**, Atefi, A., Naldrett, M. J., Alvarez, S., Ge, Y., & Schnable, J. C. (2022). Variation in morpho-physiological and metabolic responses to low nitrogen stress across the sorghum association panel. *bioRxiv*, 2022.06.08.495271. https://doi.org/10.1101/2022.06.08.495271

Li, M., **Wijewardane, N.K.**, Ge, Y., Xu, Z., & Wilkins, M. R. (2020). Visible/near infrared spectroscopy and machine learning for predicting polyhydroxybutyrate production cultured on alkaline pretreated liquor from corn stover. *Bioresource Technology Reports*, 100386. https://doi.org/https://doi.org/10.1016/j.biteb.2020.100386

Lu, Y., Young, S., Wang, H., & **Wijewardane, N.K.** (2022). Robust plant segmentation of color images based on image contrast optimization. *Computers and Electronics in Agriculture*, *193*, 106711. https://doi.org/10.1016/j.compag.2022.106711

Murad, M., Jones, E., Minasny, B., McBratney, A., **Wijewardane, N.K.**, & Ge, Y. (2022). Assessing a visnir penetrometer system for in-situ estimation of soil organic carbon under variable soil moisture conditions. *Biosystems Engineering*, *224*, 197–212. https://doi.org/10.1016/j.biosystemseng.2022.10.011

Poudel, S., Vennam, R. R., Shrestha, A., Reddy, K. R., **Wijewardane, N.K.**, Reddy, K. N., & Bheemanahalli, R. (2023). Resilience of soybean cultivars to drought stress during flowering and early-seed setting stages. *Scientific Reports*, *13*, 1277. https://doi.org/10.1038/s41598-023-28354-0

Wijewardane, N. K., Ge, Y., & Morgan, C. L. S. (2016). Moisture insensitive prediction of soil properties from VNIR reflectance spectra based on external parameter orthogonalization. *Geoderma*, *267*, 92–101. https://doi.org/http://dx.doi.org/10.1016/j.geoderma.2015.12.014

Wijewardane, N. K., Ge, Y., Wills, S., & Libohova, Z. (2018). Predicting physical and chemical properties of U.S. soils with a mid-infrared reflectance spectral library. *Soil Science Society of America Journal*. https://doi.org/10.2136/sssaj2017.10.0361

Wijewardane, N.K., Ge, Y., & Morgan, C. L. S. (2016). Prediction of soil organic and inorganic carbon at different moisture contents with dry ground VNIR: A comparative study of different approaches. *European Journal of Soil Science*, 605–615. https://doi.org/10.1111/ejss.12362

Wijewardane, N.K., Ge, Y., Sihota, N., Hoelen, T., Miao, T., & Weindorf, D. C. (2020). Predicting total petroleum hydrocarbons in field soils with VisNIR models developed on laboratory-constructed samples. *Journal of Environmental Quality*. https://doi.org/10.1002/jeq2.20102

Wijewardane, N.K., Ge, Y., Wills, S., & Loecke, T. (2016). Prediction of soil carbon in the conterminous United States: Visible and near infrared reflectance spectroscopy analysis of the rapid carbon assessment project. *Soil Science Society of America Journal*, *80*(4), 973–982. https://doi.org/10.2136/sssaj2016.02.0052

Wijewardane, N.K., Hetrick, S., Ackerson, J., Morgan, C. L. S., & Ge, Y. (2020). VisNIR integrated multi-sensing penetrometer for in situ high-resolution vertical soil sensing. *Soil and Tillage Research*, *199*, 104604. https://doi.org/https://doi.org/10.1016/j.still.2020.104604

Yuan, W., **Wijewardane, N.K.**, Jenkins, S., Bai, G., Ge, Y., & Graef, G. L. (2019). Early Prediction of Soybean Traits through Color and Texture Features of Canopy RGB Imagery. *Scientific Reports*, *9*(1), 14089. https://doi.org/10.1038/s41598-019-50480-x

Zhang, H., Ge, Y., Xie, X., Atefi, A., **Wijewardane, N.K.**, & Thapa, S. (2022). High throughput analysis of leaf chlorophyll content in sorghum using rgb, hyperspectral, and fluorescence imaging and sensor fusion. *Plant Methods*, *18*, 60. https://doi.org/10.1186/s13007-022-00892-0

Proceeding Abstracts and Presentations

Koide, T., Nagamori, M., **Wijewardane, N.K.**, Watanabe, Y., Isobe, Y., Herath, G. B. B., Mowjood, M. I. M., & Kawamoto, K. (2013). Spatial variation in landfill gas composition in Sri Lanka landfills. *SARDINIA 2013,Fourteenth International Waste Management and Landfill Symposium. S. Margherita di Pula, Cagliari, Italy*.

Nagamori, M., Isobe, Y., Watanabe, Y., **Wijewardane, N.K.**, Mowjood, M. I. M., Koide, T., & Kawamoto, K. (2012). Comparison of several landfill gas compositions between Japan and Sri Lanka. *The 7th Asian Pacific Landfill Symposium, Bali, Indonesia*, *19*, 558–564.

Nagamori, M., Isobe, Y., Watanabe, Y., **Wijewardane, N.K.**, Mowjood, M. I. M., Koide, T., & Kawamoto, K. (2013). Characterization of major and trace components in gases generated from municipal solid waste landfills in Sri Lanka. *SARDINIA 2013,Fourteenth International Waste Management and Landfill Symposium. S. Margherita di Pula, Cagliari, Italy*.

Wijewardane, N.K. & Ge, Y. (2015). Comparison of EPO and DS in Removing the Moisture Effect from Soil Vis-NIR Reflectance Spectra. *ASA, CSSA & SSSA International Annual Meetings, Minneapolis, MN, USA*.

Wijewardane, N.K. & Ge, Y. (2016). Laboratory evaluation of two VNIR optical sensor designs for vertical soil sensing. *13th International Conference on Precision Agriculture, St. Louis, Missouri, USA*.

Wijewardane, N.K., Ge, Y., & Bai, G. (2015). Potential of EPO in moisture-independent prediction of intact soil properties from dry ground soil VisNIR reflectance spectra. *2015 ASABE Annual International Meeting, New Orleans, Louisiana, USA*.

Wijewardane, N.K., Ge, Y., & Morgan, C. L. S. (2017). An integrated VNIR penetrometer system for vertical soil sensing. *2017 ASABE Annual International Meeting, Spokane, Washington, USA*.

Wijewardane, N.K., Ge, Y., & Morgan, C. L. S. (2018). Field testing of a novel VNIR penetrometer system for vertical soil sensing. *2018 ASABE Annual International Meeting, Detroit, Michigan, USA*.

Wijewardane, N.K., Ge, Y., Morgan, C. L. S., & Ackerson, J. (2017). A VNIR penetrometer for soil profile sensing. *Pedometrics 2017, Wageningen, Netherlands*.

Wijewardane, N.K., Ge, Y., Wills, S., & Loecke, T. (2016). Predicting soil properties using a national VNIR library: Comparison of modeling techniques and their computational resource use. *2016 ASABE Annual International Meeting,Orlando, Florida, USA*.

Wijewardane, N.K., Hetrick, S., Ackerson, J., Morgan, C. L. S., & Ge, Y. (2019). Automated, in-situ, and high-resolution vertical soil sensing with a visnir penetrometer system. *International Soils Meeting, Soil Science Society of America, San Diego, CA, USA*.

Wijewardane, N.K., Koide, T., Mowjood, M. I. M., Nagamori, M., Kawamoto, K., & Herath, G. B. B. (2013). Clustering open dumpsites in Sri Lanka based on waste characteristics. *SARDINIA 2013, Fourteenth International Waste Management and Landfill Symposium. S. Margherita di Pula, Cagliari, Italy*.

Wijewardane, N.K., Wang, L., Zhan, Y., Franz, T., Yu, H., Zhou, Y., Shi, Y., & Ge, Y. (2019a). Mapping infield variability of soil properties to support precision agriculture using uav, multi-depth ec, and aerial hyperspectral imagery. *5th Global Workshop on Proximal Soil Sensing, Columbia, MO, USA*.

Wijewardane, N.K., Wang, L., Zhan, Y., Franz, T., Yu, H., Zhou, Y., Shi, Y., & Ge, Y. (2019b). Mapping infield variability of soil properties using different spatial data: Uav, multi-depth ec, and aerial hyperspectral imagery. *2019 ASABE Annual International Meeting, Boston, MA, USA*.

Media Communications

- Wijewardane, Nuwan K. Webinar. "Soil sample preparation for MIR measurement: Is fine grinding necessary for accurate MIR predictions?". *FAO-GSP-GLOSOLAN Soil Spectroscopy Training Workshops*. September 7, 2022.
- Ge, Yufeng and Wijewardane, Nuwan K. Interview by Scott Schrage. "Prototype uses light to gauge composition, density of subsoils". *Nebraska Today, University of Nebraska-Lincoln*. April 7, 2020. https://news.unl.edu/newsrooms/today/article/prototype-uses-light-to-gauge-composition-density-of-subsoils/
- Wijewardane, Nuwan K. Interview by Kaine Korzekwa. "Technology can help speed soil recovery after oil spills". *American Society of Agronomy — Crop Science Society of America — Soil Science Society of America*. August 12, 2020. https://www.soils.org/news/science-news/technology-can-help-speed-soil-recovery-after-oil-spills

Honors, Awards, and Scholarships

- Widaman Distinguished Graduate Fellowship Award, Agriculture Research Division, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln – 2018.
- Outstanding International Graduate Student Award, Department of Biological Systems Engineering, University of Nebraska-Lincoln – 2018.
- Outstanding Graduate Student Award, 13th International Conference on Precision Agriculture, St. Louis, Missouri – 2016.

- Boyd-Scott Graduate Research Award, ASABE Annual International Meeting, Spokane, Washington, USA – 2017.
- David H. & Anne E. Larrick Memorial Student Travel Fund, Agricultural Research Division (ARD), University of Nebraska-Lincoln – 2016
- College of Engineering Graduate Student Conference Travel Grant, University of Nebraska-Lincoln – 2016

Teaching

Agricultural & Biological Engineering, Mississippi State University **USA**

Instructor *Spring*

ABE 4163/6163: Machinery Management in Agro-Ecosystems

Agricultural & Biological Engineering, Mississippi State University **USA**

Instructor *Fall*

ABE 2173: Principles of Agricultural and Off-Road Machines

Agricultural & Biological Engineering, Mississippi State University **USA**

Instructor *Fall*

ABE 4443/6443: Spectroscopic Sensing in Biosystems

Biological Systems Engineering, University of Nebraska-Lincoln **USA**

Teaching Assistant *Fall 2014, Fall 2016*

BSEN 460: Instrumentation and Controls

Agricultural Engineering, Faculty of Agriculture, University of Peradeniya **Sri Lanka**

Temporary Lecturer *2011, 2013-2014*

Agricultural Engineering, Faculty of Agriculture, University of Ruhuna **Sri Lanka**

Probationary Lecturer *2013*