

# Piyush Pandey

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## EDUCATION

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2022 (Expected)	<b>Ph.D.</b> <b>Biological and Agricultural Engineering</b> and Forestry and Environmental Resources	NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC
2017	<b>M.S. in Agricultural and Biological Systems Engineering</b> <b>Thesis title:</b> "High Throughput Phenotyping of Sorghum for the Study of Growth Rate, Water Use Efficiency, and Chemical Composition". <a href="#">Link to thesis.</a>	UNIVERSITY OF NEBRASKA, LINCOLN, NE
2014	<b>B.S. in Mechanical Engineering</b> Final year thesis on design and fabrication of a post-harvest citrus grading machine	TRIBHUVAN UNIVERSITY, KATHMANDU, NEPAL

## CERTIFICATION

Teaching and Communication Certificate , The Graduate School, North Carolina State University

## AWARDS AND HONORS

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2022	Outstanding Teaching Assistant	NC STATE BIOLOGICAL AND AGRICULTURAL ENGINEERING
2022	Alpha Epsilon Honor Society	
2019	University Graduate Fellowship	NC STATE UNIVERSITY
2017	Awarded second position	ASABE STUDENT ROBOTICS COMPETITION

## RESEARCH APPOINTMENT

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June 2015 - Dec 2015	<b>Research Assistant</b> Research on identification of sensor location and installation for an earthquake early warning system	NEPAL ACADEMY OF SCIENCE AND TECHNOLOGY, LALITPUR, NEPAL
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## PUBLICATIONS

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### JOURNAL PUBLICATIONS

1. Pandey, P., Whipker, B., Veazie, P., & Young, S. (2022). **Non-destructive Characterization of Macronutrients in Hydroponic Lettuce Using Hyperspectral Imaging** *Computers and Electronics in Agriculture (In preparation)*.
2. Pandey, P., Payn, K.G., Lu, Y., Heine, A.J., Walker, T.D., Acosta, J.J., & Young, S. (2021). **Hyperspectral Imaging Combined with Machine Learning for the Detection of Fusiform Rust Disease Incidence in Loblolly Pine Seedlings** *Remote Sensing*; 13(18):3595. <https://doi.org/10.3390/rs13183595>
3. Pandey, P., Dakshinamurthy, H.N., & Young, S. (2021). **Frontier: Autonomy in Detection, Actuation, and Planning for Robotic Weeding Systems.** *Transactions of the ASABE*, 64(2), 557-563. [doi.org/10.13031/trans.14085](https://doi.org/10.13031/trans.14085)
4. Lu, Y., Payn, K. G., Pandey, P., Acosta, J. J., Heine, A. J., Walker, T. D., & Young, S. (2021). **Hyperspectral Imaging with Cost-Sensitive Learning for High-Throughput Screening of Loblolly Pine (Pinus taeda L.) Seedling for Freeze Tolerance.** *Transactions of the ASABE*, 64(6): 2045-2059. [doi.org/10.13031/trans.14708](https://doi.org/10.13031/trans.14708).

5. Lu, Y., Walker, T. D., Acosta, J. J., Young, S., **Pandey, P.**, Heine, A. J., & Payn, K. G. (2021). **Prediction of Freeze Damage and Minimum Winter Temperature of the Seed Source of Loblolly Pine Seedlings Using Hyperspectral Imaging.** *Forest Science*, 67(3), 321-334. doi.org/10.1093/forsci/xfab003.
6. Liang, Z., **Pandey, P.**, Stoerger, V., Xu, Y., Qiu, Y., Ge, Y., & Schnable, J. C. (2018). **Conventional and hyperspectral time-series imaging of maize lines widely used in field trials.** *Gigascience*, 7(2), gix117. <https://doi.org/10.1093/gigascience/gix117>
7. **Pandey, P.**, Ge, Y., Stoerger, V., & Schnable, J. C. (2017). **High throughput in vivo analysis of plant leaf chemical properties using hyperspectral imaging.** *Frontiers in plant science*, 8, 1348. doi.org/10.3389/fpls.2017.01348.

#### CONFERENCE PUBLICATIONS

1. **Pandey, P.**, Acosta, J. J., Payn, K. G., & Young, S. (2022). **Towards aerial robotic pollination for controlled crosses in *Pinus taeda*.** In 2022 ASABE Annual International Meeting. American Society of Agricultural and Biological Engineers.
2. **Pandey, P.**, Payn, K. G., Lu, Y., Heine, A. J., Walker, T. D., & Young, S. (2020). **High Throughput Phenotyping for Fusiform Rust Disease Resistance in Loblolly Pine Using Hyperspectral Imaging.** In 2020 ASABE Annual International Virtual Meeting (p. 1). American Society of Agricultural and Biological Engineers. <https://elibrary.asabe.org/abstract.asp?aid=51616>
3. Lu, Y., Payn, K. G., **Pandey, P.**, Acosta, J. J., Heine, A. J., Walker, T. D., & Young, S. (2020). **Hyperspectral Imaging-Enabled High-Throughput Screening of Loblolly Pine (*Pinus taeda*) Seedlings for Freeze Tolerance.** In 2020 ASABE Annual International Virtual Meeting (p. 1). American Society of Agricultural and Biological Engineers. <https://elibrary.asabe.org/abstract.asp?aid=51561>
4. Ge, Y., **Pandey, P.**, & Bai, G. (2016). **Estimating fresh biomass of maize plants from their RGB images in greenhouse phenotyping.** In *Autonomous Air and Ground Sensing Systems for Agricultural Optimization and Phenotyping* (Vol. 9866, p. 986605). International Society for Optics and Photonics. SPIE Digital Library

#### PRESENTATIONS

##### POSTER PRESENTATIONS

1. **Pandey, P.**, Payn, K. G., Heine, A. J., Young, S. **Design of an Automated Controlled Pollination System for Loblolly Pine.** Presented at the European Conference on Mobile Robots. Workshop on Agricultural Robotics and Automation, August 31, 2021
2. **Pandey, P.**, Payn, K. G., Lu, Y., A. Juan, Heine, A. J., Walker, T. D., & Young, S. **High-throughput phenotyping of loblolly pine: Analysis of hyperspectral images at the plant organ level for disease resistance** Presented at the North American Plant Phenotyping Network Annual Conference, February, 2021
3. **Pandey, P.**, & Li, C. (2019, February) **Evaluation of 3D reconstruction methods with application to plant phenotyping under field conditions.** Presented at the College of Engineering Research Showcase at the University of Georgia, Feb 22, 2019.
4. **Pandey, P.**, Ge, Y., Stoerger, V., & Schnable, J. C. (2017, April). **High Throughput In vivo Analysis of Plant Leaf Chemical Properties Using Hyperspectral Imaging.** Presented at the University of Nebraska-Lincoln Research Fair, April 4-5, 2017. [Link to poster](#)

##### WORKSHOPS

1. **Hyperspectral image analysis for plant phenotyping.** 2021 Midwest Big Data Summer School, Iowa State University, June 2021

##### INVITED PRESENTATIONS

1. **High Throughput Phenotyping of Loblolly Pine Seedlings for Disease Resistance Using Hyperspectral Imaging.** NCSU Cooperative Tree Improvement Program Contact Meeting December 2-3, 2020
2. **Computer vision and pollinating robots in the breeding of loblolly pine.** Camcore Annual Meeting 2021, December 1.

TEACHING APPOINTMENT

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Spring 2022	<b>Co-instructor</b> <b>BAE 401/501 Sensors and Control</b> Introduction to sensors and control with lab sections using Matlab and Arduino microcontroller.	NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC
Spring 2021	<b>Instructor of Record</b> <b>2021 BAE Engineering Teaching Fellows Program</b> <b>BAE 200 Computer Methods in Biological Engineering</b> Introduction to engineering problem-solving using spreadsheets and computer programming in R.	NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC
Fall 2020	<b>Teaching Assistant</b> <b>BAE 200 Computer Methods in Biological Engineering</b> Graded and provided feedback on student work.	NORTH CAROLINA STATE UNIVERSITY, RALEIGH, NC
Fall 2017	<b>Teaching Assistant</b> <b>BSEN 460/860 Instrumentation and Controls</b> Conducted laboratories, delivered lecture, supervised student projects.	UNIVERSITY OF NEBRASKA-LINCOLN, LINCOLN, NE

PEER REVIEW

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**Reviewer**

Frontiers in Plant Science (2\*)

Computers and Electronics in Agriculture (2)

Applied Engineering in Agriculture (2)

AAAI 2022: Workshop on AI for Agriculture and Food Systems (5)

**Co-reviewer**

The Plant Journal (2)

IEEE Robotics and Automation Letters (2)

*\* Number in parenthesis is number of papers reviewed*SERVICE

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**Committee member:** ASABE MS-60 Unmanned Aerial Systems**Judge:** ASABE Robotics Student Design Competition 2020**Application reviewer:** UNL Graduate Travel Awards Program (GTAP) 2017MENTORSHIP

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**Undergraduate researchers****Kate Yang, Ema Muslic**, University of Nebraska-Lincoln (2022)

Project: Greenhouse phenotyping of plants

**Spencer Corkins**, North Carolina State University (2022)

Project: Quadrotor design and control

**Senior design teams****Arianna Braiman, Erica Lisowe, Devon Hoyle, Garrett Forro**, North Carolina State University (2020)

Project: Automating the Controlled Pollination Process of Loblolly Pine in North Carolina with Drones

**Callie Stanek**, North Carolina State University (2020)

Project: Monitoring of turkey aggression using a Raspberry Pi Computer

**Student robotics group****UNL Huskerbots Robotics Team**, University of Nebraska-Lincoln (2017)

**MEMBERSHIPS**

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<b>American Society of Agricultural and Biological Engineers</b>	MEMBER
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<b>North American Plant Phenotyping Network</b>	MEMBER
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**CERTIFICATIONS**

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Certified Remote UAS Drone Pilot under FAA Part 107.