



ALLSENSORS 2025 - The Tenth International Conference on Advances in Sensors, Actuators,  
Metering and Sensing



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## ***Special Track***

***STSA: Sensors, Actuators, and Metering for  
Agriculture and Knowledge in Engineering***



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# Outline

1. Introduction
2. Presentations of the accepted Papers
3. Open discussion and closing remarks

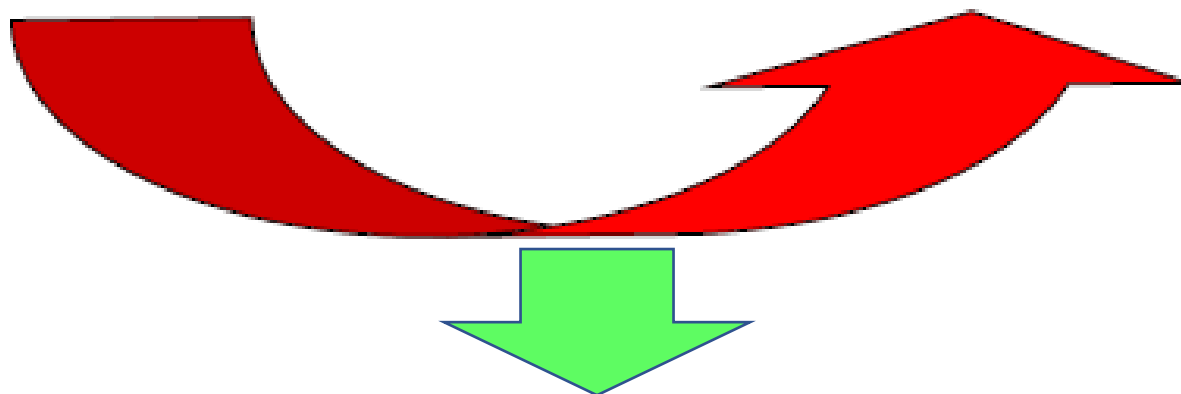




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- Productivity
- Efficiency
- Breeding of new varieties
- Pest control
- Fertilization

- Effects on the environment
- Biological diversity
- Animal welfare
- Soil degradation
- Food, Fibers and Energy quality



**Productivity – Resilience – Storage – Accessibility**





## **works and application areas**

- Sensors, signal and image processing
- Actuators in control process
- Modeling, simulation, and emulation
- Interoperability and Internet of things
- Big data analysis, architectures, and infrastructures
- Computational Intelligence applied to sensors and actuators data analysis
- AI-soft sensors-driven applications



## Fields of Interest

- Agricultural management systems
- Agricultural business, and economy
- Engineering and humanity
- Sciences for agriculture
- Silage and grain storage
- Plant phenotyping and pest control
- Rational use of agricultural inputs
- Automation and decision making in agriculture



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## **Session ALLSENSORS/STSA I**

**78001 Reducing the Dead Zone Time effect of actuators in Sensor-Based Agricultural Sprayers under S-shaped functions Gain Scheduling Management of a Generalized Predictive Control (GPC) strategy - Deniver Schutz, University of São Paulo, Brazil**

**78002 Evaluation of an IoT System Used with Sensors for the Recognition of Invasive Plants in Groundnut Crops – Bruno Moraes Moreno, Federal University of São Carlos, Brazil**

**78004 Using Radar Chart Areas to Evaluate the Sensitivity of Electronic Nose Sensors in Detecting Water Stress in Soybean – Paulo S de Paula Herrmann Jr., Embrapa Instrumentation, Brazil**

**500013 Proposal for a System to Estimate the Best Time to Yellow Leaves using IoT Devices for Tourists – Shige yoshi, Polytechnic University, Japan**



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## **Session ALLSENSORS/STSA II**

**78005 Applicability Assessment of a Thermo-formed Piezoelectret Accelerometer in Agricultural Robotics Systems - Igor Nazareno Soares, Department of Electrical and Computer Engineering, Engineering School of São Carlos, University of São Paulo, Brazil**

**78006 A Prototype of a Monitoring Sensor System for Stored Grains in a Real-world Setting - Jose Pessoa, Embrapa Instrumentação, Brasil**

**78007 Sensor-Based Platform for Evaluation of Atmospheric Carbon Sequestration's Potential by Maize Crops - Paulo Estevao Cruvinel, Embrapa, Brazil**

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## **Papers Presentation**



## **Final Remarks**

- ✓ It was presented seven scientific papers.
- ✓ The first presentation explained a study related to the dead zone time reduction effect of actuators based on the use of sensors and advanced control in agricultural sprayers.



## **Final Remarks**

- ✓ The second presentation discussed an evaluation of an IoT system based on the use of sensors for weed family recognition in groundnut crops.
- ✓ The third presentation explored the use of a radar to evaluate the sensitivity of an electronic nose sensor in the soybean's water stress detection.



## **Final Remarks**

- ✓ The fourth presentation illustrated an applicability assessment of a thermoformed piezoelectret accelerometer and its use in agricultural robotics systems.
- ✓ The fifth presentation illustrated a prototype for a grain storage monitoring sensor-based system, useful for a real-world setting.



## **Final Remarks**

- ✓ The sixth presentation was related to a sensors-platform for evaluation of atmospheric carbon sequestration's potential by maize crops, i.e., based on a new index. This study has led to new insights into the management of crop fields for food and energy production.





## **Final Remarks**

- ✓ The seventh paper presented a proposal for a system to estimate the best time to see yellow leaves using iot devices for tourists. It uses image classification and deep learning (ResNeXt). Besides, such a method proposal detects the rate of yellowing and falling leaves from ginkgo images.



## **Final Remarks**

Finally, despite challenges related to the development and use of sensors and actuators in agriculture, nowadays, one may observe the rising need for them, since they play an important role in decision-making related to risk minimization and to the correct use of agricultural inputs. Let's continue looking for the development and applications of SENSORS and ACTUATORS in agriculture.



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Thank you all for participating  
in this Special Track!