

# **Terahertz-Based Joint Communication and Sensing for Precision Agriculture**

Speaker: Dr. Euclides Lourenço Chuma (euclides.chuma@ieee.org)

The escalation of global population alone constitutes a driving force behind the augmentation of food production, consequently resulting in an increase in agricultural output. Nevertheless, aside from population growth, agricultural productivity is subject to additional challenges, including climate change, which underscore precision agriculture as a potential solution to mitigate emerging obstacles.

Precision Agriculture is conceptualized as an intelligent management system with the capacity to meticulously monitor, observe, sense, measure, and regulate the health and moisture levels of plants at the micro-scale and crops at the macro-scale. The overarching objective is to optimize production while conserving essential resources. The integration of terahertz (THz) based sensing technology for assessing plant health, coupled with the high communication transmission rates from the terahertz spectrum, will make it possible to deploy wireless sensor networks within crops to monitor diverse variables and facilitate informed decision-making, representing a significant advancement. Achieving seamless integration and operation of such sensing and communication systems necessitates the new semiconductor devices to operate in the frontiers of the terahertz spectrum with cost-effective solutions.