

## **Research Project Proposal Title:**

### **Crop conditions monitoring and yield prediction using IoT systems and Machine Learning Techniques for Precision Agriculture (Case study of maize in Rwanda)**

#### **Abstract**

Food insecurity has become a huge problem affecting developing countries particularly in sub-Saharan Africa. The main aim of this project is to enhance food security measures through the integrated use of IoT systems and Machine learning techniques. The satellite remote sensing has proved much contribution making it possible to monitor and manage crops for precision agriculture practices but there are still some challenges in regards to resolution and quality of collected data. The ability of IoT devices to collect data in resolution and field wide in precision agriculture has attracted the attention of key players in agronomic crop production as well as in agronomical research due to their high accuracy and efficiency compared to the satellite and manned aircrafts methods which used to be efficient over the past years but did not increase popularity due to their expensive operating costs. Our study will put in place Unmanned Aerial Vehicle (UAVs) with elevated wireless sensors and machine learning techniques to monitor the crop conditions while predicting the yield for the farmers to act accordingly. The use of UAVs with elevated sensors in remote sensing together with Wireless Sensor Networks (WSN) for agricultural practices provides spatial and spectral, and ground data used for monitoring and analyzing a crop's condition. The obtained results during this study will be compared with the other results obtained using common methods of human estimation of diseases, machine learning, and satellite.