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Remote monitoring of agricultural crops using the application of spectral imaging- spectral remote sensing

Archana Nandibewoor

Visvesvaraya Technological University, India

One of the emerging technologies that can be used to study the rate of vegetation is spectral remote sensing. This study includes two types of image data - Hyper spectral satellite image and Multi spectral satellite image. Hyper spectral satellite image data was used to calculate different spectral indices. The study on spectral indices which show some significant changes with variation in vegetation are discussed. These spectral indices normalized differential vegetation index (NDVI), simple Ratio pigment index (SRPI), red edge (Clrededge) and SG (VI green) are used to monitor the vegetation. All these spectral indices stated above showed significant changes with change in rate of chlorophyll and nitrogen concentration. The graph plotted for different wavelengths verses the reflectance values showed different curves for change in the area. Hence satellite images can give lot of information that needs to be explored. Three datasets of Multi spectral satellite image data (7 Dec 2013, 8 Jan 2014, 9 Feb 2014) have been acquired from Land sat 8 OLI (Operational Land Imager)/TIRS (Thermal Infrared Sensor) satellite periodically by providing appropriate path and row in order to assess the growing stages of crop. The acquired images are in the form of a set of bands. Appropriate bands are combined to form a multispectral RGB image. A spectral line graph is plotted by using reflectance data of the specified area of crop. It is found that there is high reflectance in green bands during growing stage and this value gets decreased during the near harvesting stage. Also NDVI value has been calculated at each stage. The status of the maize crop has been concluded by experimental analysis at Laboratory and by using NDVI values. Finally, it is observed that the crops are healthy.

narchana2006@gmail.com

Back-end realization of AIS protocol using FPGA

Keyur Mahant, Amit Patel, Alpesh Vala and Riddhi Goswami

Charotar University of Science & Technology, India

This research and development paper gives the information about AIS protocol, its applications and implementation of the protocol in Field Programmable Gate Array (FPGA). Automatic Identification System (AIS) protocol is a scheme for generating a self-organized data network between marine vessels. AIS can be used for Collision avoidance, Search & rescue, Fishing Fleet Monitoring and Control, Vessel traffic services and aids to navigation. AIS Transponder on ship broadcast information regarding its speed, position and navigational status at regular interval using VHF transponder at 161.975 MHz and 162.025 MHz's. These speed, position and direction information is generated from the ship's navigational sensors, navigation satellite system (GNSS) receiver and gyrocomp pass. Other information like name of the vessel and VHF call sign is programmed when installing the equipment and it is also transmitted at regular intervals. This research paper proposes a technique for implementation of AIS protocol in FPGA. In this paper FPGA is used for processing the data because this technology gives flexible designs with relatively short design time and at the same time maintain some of the good properties of ASICs, such as relatively high performance and low power consumption.

keyurmahant.ec@charusat.ac.in, amitvpatel.ec@charusat.ac.in