

Agile Real-Time Field Programmable Gate Array-Based Image Processing System for Drone Imagery in Digital Agriculture

Authors : Sabiha Shahid Antora, Young Ki Chang

Abstract : Along with various farm management technologies, imagery is an important tool that facilitates crop assessment, monitoring, and management. As a consequence, drone imaging technology is playing a vital role to capture the state of the entire field for yield mapping, crop scouting, weed detection, and so on. Although it is essential to inspect the cultivable lands in real-time for making rapid decisions regarding field variable inputs to combat stresses and diseases, drone imagery is still evolving in this area of interest. Cost margin and post-processing complexions of the image stream are the main challenges of imaging technology. Therefore, this proposed project involves the cost-effective field programmable gate array (FPGA) based image processing device that would process the image stream in real-time as well as providing the processed output to support on-the-spot decisions in the crop field. As a result, the real-time FPGA-based image processing system would reduce operating costs while minimizing a few intermediate steps to deliver scalable field decisions.

Keywords : real-time, FPGA, drone imagery, image processing, crop monitoring

Conference Title : ICABE 2021 : International Conference on Agricultural and Biosystems Engineering

Conference Location : Montreal, Canada

Conference Dates : June 14-15, 2021