A HYBRID MACHINE LEARNING APPROACH TO AUTOMATIC PLANT PHENOTYPING FOR SMART AGRICULTURE

ABSTRACT:

Recently, a new ICT approach to agriculture called "Smart Agriculture" has been received great attention to support farmers decision making for good final yield on various kinds of field conditions. For this purpose, this paper presents two image sensing methods that enable an automatic observation to capture flowers and seedpods of soybeans in real fields. The developed image sensing methods are considered as sensors in an agricultural cyber-physical system in which big data on the growth status of agricultural plants and environmental information (e.g., weather, temperature, humidity, solar radiation, soil condition, etc.) are analyzed to mine useful rules for appropriate cultivation. The proposed image sensing methods are constructed by combining several image processing and machine learning techniques. The flower detection is realized based on a course to fine approach where candidate areas of flowers are first detected by SLIC and huge information, and the acceptance of flowers is decided by CNN. In the seedpod detection, candidates of seedpod regions are first detected by the Viola-Jones object detection method, and we also use CNN to make a final decision on the acceptance of detected seedpods. The performance of the proposed image sensing methods is evaluated for a data set of soybean images that were taken from a crowd of soybeans in real agricultural fields in Hokkaido Japan.

SHIELD TECHNOLOGIES,
2232, 3RD FLOOR, 16TH B CROSS,YELAHANKA NEW TOWN, BANGALORE-64
Mail us: shieldtechnoblr@gmail.com / manager@shieldtechno.com
Contact: 9972364704 / 8073744810