

Recent Advances in Applications of Remote Image Capture Systems in Agriculture

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Efficient and sustainable agriculture requires the application of new technologies in all aspects of the production system. These technologies must combine energy efficiency, sustainable use of the resources and care for the environment, while obtaining crops of ever greater quality and quantity. Of particular importance is the application of remote image capture systems, which are increasingly being used as a means to obtain information of interest from the crops, the soil and the environment. They enable the acquisition of frequent and high-resolution information from great extensions of land, helping in agricultural decision-making in all stages of production. The field of remote imaging in agriculture includes different types of capturing devices: from satellites [1,2] and drones [3–6], to in-field devices [7–12] or combinations of them [13,14]; different types of spectral information, from visible RGB images [4,6,8,9,11,12], to thermal and infrared images [7,13], and multispectral images [1–3,5,14]; different types of applications, including water management [3,7,10], plant monitoring [6,13], yield estimation [9], mapping and detection of plants [1,2,4,5,14], automatic harvesting [8,12], and learning applications [15]; and different types of techniques in the areas of image processing, computer vision, pattern recognition and machine learning. This book covers all these aspects, through a series of chapters that describe specific recent applications of these techniques in various problems of interest in agricultural engineering. It is complete with a systematic mapping study [16] that surveys the current state of the art in this exciting and highly active domain.

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