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Additional Information

Special Issue: Image Analysis in Agriculture

Editorial

This issue was developed from innovative scientific contributions presented at the IV International Workshop on Computer Image Analysis in Agriculture, held at CIGR-AgEng 2012, Valencia, Spain, on July 2012. The workshop was organised by the CIGR Working Group (WG) on Image Analysis for Agricultural Products and Processes. The objectives of this WG are to meet recent demands on process monitoring in agricultural production, during storage and processing of raw material and to develop objective, sensitive, and reliable optical tools for receiving analytical data in a non-destructive way. There is a substantial need for food security in agriculture and this is an essential component of the world economy. The implementation of advanced and competitive technology in machine vision and image processing applied to processes in agriculture allows an enhanced degree of modern production and efficiency by increasing automation. The integration of these new technologies will result in a reduction of the producing costs, more rational use of the resources and, therefore, encourage competitiveness. In addition, food standards are evolving to ensure the sustainability of agriculture and to address consumer concerns about quality and the safety of the food. Artificial vision systems allow control and monitoring tools to be created and applied in the whole food production chain from the field or the greenhouse, through harvesting, produce sorting, and postharvest measures. The reputation of the producer is judged by the consumer by the quality of the final product, which makes quality control a crucial tool along the chain. The market and consumer exigencies as well as the social concerns about environmentally friendly practices, sustainability and traceability place an obligation on producers to guarantee quality from the earlier production stages of any crop. Machine vision and other optical technology allow the creation of feasible non-destructive tools to guarantee this quality. Challenges result from the nature of the produce itself. All biological products differ in terms of colour, shape, size and because they are alive and continuously change over time. Furthermore, the production and handling of agricultural products is often performed outdoors or under extremely variable conditions (temperature, humidity, illumination, etc.).

Addressing these challenges requires research in advanced technologies and multidisciplinary approaches based on deep knowledge of the processes. An integrated approach to better understand the different stages involved in the whole process of the crop is required to provide practical and innovative solutions. This issue presents a collection of papers covering different optical technologies applied to different agricultural tasks using different approaches, including X-rays, hyperspectral imaging or in-line inspection applied to crop monitoring, plant inspection, or quality control of fruit and vegetables. The studies are diverse, coming from authors in ten different countries and three continents. We would like to thank Instituto Valenciano de Investigaciones Agrarias (IVIA), organiser of the CIGR-AgEng 2012 Conference and the board of the CIGR Working Group on Image Analysis for Agricultural Products and Processes for their support. Moreover, we are grateful to the reviewers, who contributed to ensure the quality of this special issue, which we hope will provide a meaningful contribution to science and technology.

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