

Preface

This text aims to obtain a snapshot of the situation in the multidisciplinary, vibrant, and rapidly evolving space of precision irrigation and obtain valuable insights with technologies that can be employed and leveraged in the pursuit of the development of effective precision irrigation systems.

This book provides an overview of state-of-the-art sensing technologies relevant to the problem of precision irrigation, an emerging field within the domain of precision agriculture. Applications of wireless sensor networks, satellite data and geographic information systems in the domain are covered in the text. In addition to discussing the basic concepts of the technologies surveyed, an emphasis is placed on the practical aspects that enable the implementation of intelligent irrigation systems using the technology commercially available. As such, we hope that it will be of use to the broader audience interested in this theme. The text is organized in five chapters, each concerned with specific technology from the diverse set of ICT used to address the problem of optimal crop irrigation.

[Chapter 1](#) is concerned with the application of wireless sensor networks, which can be used to monitor the microclimatic environment at an unprecedented scale. The discussion within this chapter starts with the aspects of sensor node hardware and the solutions provided by different manufacturers. An overview communication protocols (both high- and low-level) is provided next. Finally, we take a look at the available sensor networks solutions designed specifically for smart irrigation.

[Chapter 2](#) will provide an overview of remote sensing data that can be used to assist precision irrigation. Aspects of different satellite data that can be used are discussed: satellite missions designed to assist irrigation, different products provided, data format and, in particular, ways to access the data for use in your own system.

[Chapter 3](#) deals with the aspects of Geographical Information Systems (GIS) that are an inherent part of any precision irrigation system, as the data collected and processed needs to be stored, processed, and visualized. We will provide overview of most-commonly-used GIS, both open-source and proprietary. GIS applications, designed specifically for precision agriculture, are discussed in some detail.

[Chapter 4](#) is dedicated to concluding remarks and some best-practice recommendations.

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