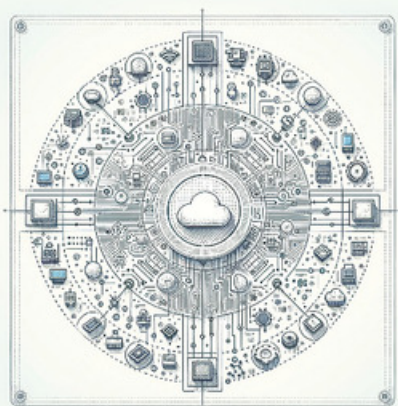Μηνάς Δασυγένης - Δημήτριος Σούντρης

Υπολογιστική Διαδικτύου των Αντικειμένων

Υπολογισμός από την άκρη μέχρι το σύννεφο

METADATA

• • •

Abstract

This book introduces the world of the Internet of Things (IoT), focusing on the fundamental principles of technology, communication, security, and applications. We have decided to divide the book into two main sections. One section provides the theoretical background for IoT and its related concepts, and another section offers autonomous laboratory exercises on IoT that guide readers through implementing specific problems. In the first section, the unique characteristics of IoT devices and their requirements regarding energy consumption, performance, communication, cost, manufacturing, packaging and security are presented. Subsequently, the main topics related to IoT, such as sensors, actuators, wireless sensor networks, single-board computers, printed circuit board (PCB) design, microprocessor architecture, storage devices, middleware, cloud servers, and reconfigurable and heterogeneous architectures, are developed. Finally, the book covers the practical application of IoT technology in various sectors, including industry, healthcare, agriculture, urban environments, homes and transportation. The second section provides instructions for developing and implementing educational tasks in IoT, as well as suggestions for addressing technological challenges. Exercises are provided for both microcontrollers and development boards, exercises that we have developed and use in our courses at the universities we are affiliated with. The book is aimed at both students and professionals, providing a comprehensive understanding of IoT and its capabilities.