

1. Record Nr.	UNINA9910561301303321
Titolo	AI and IoT-based intelligent automation in robotics // editors, Ashutosh Kumar Dubey [et al.]
Pubbl/distr/stampa	Hoboken, New Jersey ; ; Beverly, Massachusetts : , : Scrivener Publishing : , : Wiley, , [2021] ©2021
ISBN	1-5231-4317-7 1-119-71122-3 1-119-71121-5
Descrizione fisica	1 online resource (432 pages) : illustrations (chiefly color)
Disciplina	629.892
Soggetti	Artificial intelligence - Industrial applications Autonomous robots Internet of things Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover -- Half-Title Page -- Series Page -- Title Page -- Copyright Page -- Contents -- Preface -- 1 Introduction to Robotics -- 1.1 Introduction -- 1.2 History and Evolution of Robots -- 1.3 Applications -- 1.4 Components Needed for a Robot -- 1.5 Robot Interaction and Navigation -- 1.5.1 Humanoid Robot -- 1.5.2 Control -- 1.5.3 Autonomy Levels -- 1.6 Conclusion -- References -- 2 Techniques in Robotics for Automation Using AI and IoT -- 2.1 Introduction -- 2.2 Brief History of Robotics -- 2.3 Some General Terms -- 2.4 Requirements of AI and IoT for Robotic Automation -- 2.5 Role of AI and IoT in Robotics -- 2.6 Diagrammatic Representations of Some Robotic Systems -- 2.7 Algorithms Used in Robotics -- 2.8 Application of Robotics -- 2.9 Case Studies -- 2.9.1 Sophia -- 2.9.2 ASIMO -- 2.9.3 Cheetah Robot -- 2.9.4 IBM Watson -- 2.10 Conclusion -- References -- 3 Robotics, AI and IoT in the Defense Sector -- 3.1 Introduction -- 3.2 How Robotics Plays an Important Role in the Defense Sector -- 3.3 Review of the World's Current Robotics

Capabilities in the Defense Sector -- 3.3.1 China -- 3.3.2 United State of America -- 3.3.3 Russia -- 3.3.4 India -- 3.4 Application Areas of Robotics in Warfare -- 3.4.1 Autonomous Drones -- 3.4.2 Autonomous Tanks and Vehicles -- 3.4.3 Autonomous Ships and Submarines -- 3.4.4 Humanoid Robot Soldiers -- 3.4.5 Armed Soldier Exoskeletons -- 3.5 Conclusion -- 3.6 Future Work -- References -- 4 Robotics, AI and IoT in Medical and Healthcare Applications -- 4.1 Introduction -- 4.1.1 Basics of AI -- 4.1.1.1 AI in Healthcare -- 4.1.1.2 Current Trends of AI in Healthcare -- 4.1.1.3 Limits of AI in Healthcare -- 4.1.2 Basics of Robotics -- 4.1.2.1 Robotics for Healthcare -- 4.1.3 Basics of IoT -- 4.1.3.1 IoT Scenarios in Healthcare -- 4.1.3.2 Requirements of Security -- 4.2 AI, Robotics and IoT: A Logical Combination. 4.2.1 Artificial Intelligence and IoT in Healthcare -- 4.2.2 AI and Robotics -- 4.2.2.1 Limitation of Robotics in Medical Healthcare -- 4.2.3 IoT with Robotics -- 4.2.3.1 Overview of IoMRT -- 4.2.3.2 Challenges of IoT Deployment -- 4.3 Essence of AI, IoT, and Robotics in Healthcare -- 4.4 Future Applications of Robotics, AI, and IoT -- 4.5 Conclusion -- References -- 5 Towards Analyzing Skill Transfer to Robots Based on Semantically Represented Activities of Humans -- 5.1 Introduction -- 5.2 Related Work -- 5.3 Overview of Proposed System -- 5.3.1 Visual Data Retrieval -- 5.3.2 Data Processing to Attain User Objective -- 5.3.3 Knowledge Base -- 5.3.4 Robot Attaining User Goal -- 5.4 Results and Discussion -- 5.5 Conclusion -- References -- 6 Healthcare Robots Enabled with IoT and Artificial Intelligence for Elderly Patients -- 6.1 Introduction -- 6.1.1 Past, Present, and Future -- 6.1.2 Internet of Things -- 6.1.3 Artificial Intelligence -- 6.1.4 Using Robotics to Enhance Healthcare Services -- 6.2 Existing Robots in Healthcare -- 6.3 Challenges in Implementation and Providing Potential Solutions -- 6.4 Robotic Solutions for Problems Facing the Elderly in Society -- 6.4.1 Solutions for Physical and Functional Challenges -- 6.4.2 Solutions for Cognitive Challenges -- 6.5 Healthcare Management -- 6.5.1 Internet of Things for Data Acquisition -- 6.5.2 Robotics for Healthcare Assistance and Medication Management -- 6.5.3 Robotics for Psychological Issues -- 6.6 Conclusion and Future Directions -- References -- 7 Robotics, AI, and the IoT in Defense Systems -- 7.1 AI in Defense -- 7.1.1 AI Terminology and Background -- 7.1.2 Systematic Sensing Applications -- 7.1.3 Overview of AI in Defense Systems -- 7.2 Overview of IoT in Defense Systems -- 7.2.1 Role of IoT in Defense -- 7.2.2 Ministry of Defense Initiatives -- 7.2.3 IoT Defense Policy Challenges. 7.3 Robotics in Defense -- 7.3.1 Technical Challenges of Defense Robots -- 7.4 AI, Robotics, and IoT in Defense: A Logical Mix in Context -- 7.4.1 Combination of Robotics and IoT in Defense -- 7.4.2 Combination of Robotics and AI in Defense -- 7.5 Conclusion -- References -- 8 Techniques of Robotics for Automation Using AI and the IoT -- 8.1 Introduction -- 8.2 Internet of Robotic Things Concept -- 8.3 Definitions of Commonly Used Terms -- 8.4 Procedures Used in Making a Robot -- 8.4.1 Analyzing Tasks -- 8.4.2 Designing Robots -- 8.4.3 Computerized Reasoning -- 8.4.4 Combining Ideas to Make a Robot -- 8.4.5 Making a Robot -- 8.4.6 Designing Interfaces with Different Frameworks or Robots -- 8.5 IoRT Technologies -- 8.6 Sensors and Actuators -- 8.7 Component Selection and Designing Parts -- 8.7.1 Robot and Controller Structure -- 8.8 Process Automation -- 8.8.1 Benefits of Process Automation -- 8.8.2 Incorporating AI in Process Automation -- 8.9 Robots and Robotic Automation -- 8.10 Architecture of the Internet of Robotic Things -- 8.10.1 Concepts of Open Architecture Platforms -- 8.11 Basic Abilities -- 8.11.1 Discernment Capacity -- 8.11.2 Motion Capacity -- 8.11.3

Manipulation Capacity -- 8.12 More Elevated Level Capacities -- 8.12.1
Decisional Self-Sufficiency -- 8.12.2 Interaction Capacity -- 8.12.3
Cognitive Capacity -- 8.13 Conclusion -- References -- 9 An Artificial
Intelligence-Based Smart Task Responder: Android Robot for Human
Instruction Using LSTM Technique -- 9.1 Introduction -- 9.2 Literature
Review -- 9.3 Proposed System -- 9.4 Results and Discussion -- 9.5
Conclusion -- References -- 10 AI, IoT and Robotics in the Medical and
Healthcare Field -- 10.1 Introduction -- 10.2 A Survey of Robots and AI
Used in the Health Sector -- 10.2.1 Surgical Robots -- 10.2.2
Exoskeletons -- 10.2.3 Prosthetics -- 10.2.4 Artificial Organs.
10.2.5 Pharmacy and Hospital Automation Robots -- 10.2.6 Social
Robots -- 10.2.7 Big Data Analytics -- 10.3 Sociotechnical
Considerations -- 10.3.1 Sociotechnical Influence -- 10.3.2 Social
Valence -- 10.3.3 The Paradox of Evidence-Based Reasoning -- 10.4
Legal Considerations -- 10.4.1 Liability for Robotics, AI and IoT --
10.4.2 Liability for Physicians Using Robotics, AI and IoT -- 10.4.3
Liability for Institutions Using Robotics, AI and IoT -- 10.5 Regulating
Robotics, AI and IoT as Medical Devices -- 10.6 Conclusion --
References -- 11 Real-Time Mild and Moderate COVID-19 Human Body
Temperature Detection Using Artificial Intelligence -- 11.1 Introduction
-- 11.2 Contactless Temperature -- 11.2.1 Bolometers (IR-Based) --
11.2.2 Thermopile Radiation Sensors (IR-Based) -- 11.2.3 Fiber-Optic
Pyrometers -- 11.2.4 RGB Photocell -- 11.2.5 3D Sensor -- 11.3 Fever
Detection Camera -- 11.3.1 Facial Recognition -- 11.3.2 Geometric
Approach -- 11.3.3 Holistic Approach -- 11.3.4 Model-Based --
11.3.5 Vascular Network -- 11.4 Simulation and Analysis -- 11.5
Conclusion -- References -- 12 Drones in Smart Cities -- 12.1
Introduction -- 12.1.1 Overview of the Literature -- 12.2 Utilization of
UAVs for Wireless Network -- 12.2.1 Use Cases for WN Using UAVs --
12.2.2 Classifications and Types of UAVs -- 12.2.3 Deployment of
UAVS Using IoT Networks -- 12.2.4 IoT and 5G Sensor Technologies for
UAVs -- 12.3 Introduced Framework -- 12.3.1 Architecture of UAV IoT
-- 12.3.2 Ground Control Station -- 12.3.3 Data Links -- 12.4 UAV IoT
Applications -- 12.4.1 UAV Traffic Management -- 12.4.2 Situation
Awareness -- 12.4.3 Public Safety/Saving Lives -- 12.5 Conclusion --
References -- 13 UAVs in Agriculture -- 13.1 Introduction -- 13.2
UAVs in Smart Farming and Take-Off Panel -- 13.2.1 Overview of
Systems -- 13.3 Introduction to UGV Systems and Planning.
13.4 UAV-Hyperspectral for Agriculture -- 13.5 UAV-Based
Multisensors for Precision Agriculture -- 13.6 Automation in
Agriculture -- 13.7 Conclusion -- References -- 14 Semi-Automated
Parking System Using DSDV and RFID -- 14.1 Introduction -- 14.2 Ad
Hoc Network -- 14.2.1 Destination-Sequenced Distance Vector (DSDV)
Routing Protocol -- 14.3 Radio Frequency Identification (RFID) -- 14.4
Problem Identification -- 14.5 Survey of the Literature -- 14.6 PANet
Architecture -- 14.6.1 Approach for Semi-Automated System Using
DSDV -- 14.6.2 Tables for Parking Available/Occupied -- 14.6.3
Algorithm for Detecting the Empty Slots -- 14.6.4 Pseudo Code -- 14.7
Conclusion -- References -- 15 Survey of Various Technologies
Involved in Vehicle-to-Vehicle Communication -- 15.1 Introduction --
15.2 Survey of the Literature -- 15.3 Brief Description of the
Techniques -- 15.3.1 ARM and Zigbee Technology -- 15.3.2 VANET-
Based Prototype -- 15.3.2.1 Calculating Distance by Considering
Parameters -- 15.3.2.2 Calculating Speed by Considering Parameters
-- 15.3.3 Wi-Fi-Based Technology -- 15.3.4 Li-Fi-Based Technique --
15.3.5 Real-Time Wireless System -- 15.4 Various Technologies
Involved in V2V Communication -- 15.5 Results and Analysis -- 15.6
Conclusion -- References -- 16 Smart Wheelchair -- 16.1 Background

-- 16.2 System Overview -- 16.3 Health-Monitoring System Using IoT
-- 16.4 Driver Circuit of Wheelchair Interfaced with Amazon Alexa --
16.5 MATLAB Simulations -- 16.5.1 Obstacle Detection -- 16.5.2
Implementing Path Planning Algorithms -- 16.5.3 Differential Drive
Robot for Path Following -- 16.6 Conclusion -- 16.7 Future Work --
Acknowledgment -- References -- 17 Defaulter List Using Facial
Recognition -- 17.1 Introduction -- 17.2 System Analysis -- 17.2.1
Problem Description -- 17.2.2 Existing System -- 17.2.3 Proposed
System -- 17.3 Implementation.
17.3.1 Image Pre-Processing.
