1. Record Nr. UNINA9910734835103321

Autore	Azar Ahmad Taher
Titolo	Mobile Robot: Motion Control and Path Planning / / edited by Ahmad Taher Azar, Ibraheem Kasim Ibraheem, Amjad Jaleel Humaidi
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-26564-5
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (670 pages)
Collana	Studies in Computational Intelligence, , 1860-9503 ; ; 1090
Altri autori (Persone)	Kasim IbraheemIbraheem Jaleel HumaidiAmjad
Disciplina	629.892
Soggetti	Automatic control Robotics Automation Computational intelligence Control, Robotics, Automation Computational Intelligence
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Leader-Follower Formation Control of Mobile Robots Based on Simplified Super-Twisting Algorithm -- Deep Reinforcement Learning Applied to Multiagent Path Planning for Information Gathering in Environmental Missions -- Analysis of Computer Vision-Based Techniques for the Recognition of Landing Platforms for UAVs -- Monitoring Peak Pollution Points of Water Resources with Autonomous Surface Vehicles using a PSO-based Informative Path Planner -- Robots in Medicine: Mobile Robots Versus Mobile Decision, Necessity Versus Possibility and Future Challenges -- Event-based Robust Control Techniques for Wheel-Based Robots Under Cyber-attack and Dynamic Quantizer -- Path Optimization and Multi-Level Path Planning for The Steam Field Navigation Algorithm -- Modeling and Simulation of Quadcopter using Self-Tuning Fuzzy-PI Controller -- Using an Interactive Theorem Prover for Formally Analyzing the Dynamics of the Unmanned Aerial Vehicles -- Adaptive Fault-Tolerant Control Design for Multi-Linked Two-Wheel Drive Mobile Robots -- Design and

Implementation of a Robust 6-DOF Quadrotor Controller Based on Kalman Filter for Position Control -- Wireless Sensor Network Based Mobile Robot Applications -- Fault Diagnosis and Fault Tolerant Control for linked Two Wheel Drive Mobile Robots -- Fractional Order Extended State Observer Enhances the Performance of Controlled Tri-copter UAV Based on Active Disturbance Rejection Control -- Robust Adaptive Sliding Mode Controllers Design for a Non-holonomic Mobile Robot.

Sommario/riassunto

This book presents the recent research advances in linear and nonlinear control techniques. From both a theoretical and practical standpoint, motion planning and related control challenges are key parts of robotics. Indeed, the literature on the planning of geometric paths and the generation of time-based trajectories, while accounting for the compatibility of such paths and trajectories with the kinematic and dynamic constraints of a manipulator or a mobile vehicle, is extensive and rich in historical references. Path planning is vital and critical for many different types of robotics, including autonomous vehicles, multiple robots, and robot arms. In the case of multiple robot route planning, it is critical to produce a safe path that avoids colliding with objects or other robots. When designing a safe path for an aerial or underwater robot, the 3D environment must be considered. As the number of degrees of freedom on a robot arm increases, so does the difficulty of path planning.As a result, safe pathways for high-dimensional systems must be developed in a timely manner. Nonetheless, modern robotic applications, particularly those requiring one or more robots to operate in a dynamic environment (e.g., human–robot collaboration and physical interaction, surveillance, or exploration of unknown spaces with mobile agents, etc.), pose new and exciting challenges to researchers and practitioners. For instance, planning a robot's motion in a dynamic environment necessitates the real-time and online execution of difficult computational operations. The development of efficient solutions for such real-time computations, which could be offered by specially designed computational architectures, optimized algorithms, and other unique contributions, is thus a critical step in the advancement of present and future-oriented robotics. .