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Nota di contenuto	<p>1. Linkages for leg mechanisms / Marco Ceccarelli -- 1.1 Walking issues for robots -- 1.2 A historical survey of mechanisms for walking machines -- 1.3 Modern solutions -- 1.4 Challenges for future developments -- 1.5 Conclusions -- 1.6 References --</p> <p>2. Exoskeletons and bipeds / Qiang Huang and Zhangguo Yu -- 2.1 Exoskeletons -- 2.1.1 History and overview -- 2.1.2 Mechanism design principles -- 2.1.3 Sensing and control algorithm -- 2.1.4 Actuators and portable power supply -- 2.2 Bipeds -- 2.2.1 History and overview -- 2.2.2 Mechanism design -- 2.2.3 Motion planning -- 2.2.4 Stability control -- 2.2.5 Control system -- 2.2.6 Biped walking -- 2.3 Conclusions -- 2.4 References --</p> <p>3. Mechanical design challenges in rescue robot prototyping / Emin Faruk Kececi -- 3.1 Introduction -- 3.2 Design challenges -- 3.3 Digital prototyping -- 3.4 Physical robot prototyping -- 3.5 Design process -- 3.6 Fault analyses -- 3.6.1 Functional conflicts -- 3.6.2 Materials and manufacturing methods -- 3.6.3 Testing -- 3.7 Conclusions and future directions -- 3.8 Acknowledgment -- 3.9 References --</p> <p>4. Networked control for mobile robots / Xilung Ding -- 4.1 Introduction -- 4.2 Applications of networked control mobile robots -- 4.3 Introduction of NOROs robots -- 4.4 Advantages and challenges -- 4.5 Control challenges and achievements -- 4.5.1 Overview of NCS -- 4.5.2 Major accomplishments -- 4.6 Communication challenges and</p>

achievements -- 4.6.1 Key problems -- 4.6.2 Major accomplishments -- 4.6.3 Dynamic lunar exploration robots routing protocol -- 4.6.4 Dynamic lunar exploration robots routing protocol -- 4.6.5 The optimal ad hoc routing protocols design for multi moon exploration robots system -- 4.6.6 Simulation and results -- 4.7 Perception challenges and achievements -- 4.7.1 Key problems -- 4.7.2 Major accomplishments -- 4.7.3 Dynamic CSS localization system for NOROS robots -- 4.8 Conclusions and future works -- 4.9 References --

5. Human-machine interface of mobile robot for posture / I-Ming Chen -- 5.1 A survey of HMI for robots -- 5.1.1 Traditional input devices -- 5.1.2 Passive multi-axes manipulator -- 5.1.3 Touch screen -- 5.1.4 Human motion sensing devices -- 5.1.5 Bio-signal capture and speech recognition system -- 5.1.6 Challenges and open problems of HMI -- 5.2 Motion replication system -- 5.3 Visual and verbal feedback -- 5.3.1 Visual presentation and feedback -- 5.3.2 Visual presentation and feedback -- 5.4 System implementation -- 5.4.1 Hardware and system design -- 5.4.2 Kinematic model -- 5.4.3 Calibration procedure -- 5.4.4 Comparison method -- 5.5 Experiment -- 5.6 Results and discussion -- 5.6.1 Analysis of the questionnaire -- 5.6.2 Result of the performance -- 5.7 Conclusion -- 5.8 References --

6. Robot education with mobile robots / Jorge Solis -- 6.1 Introduction -- 6.2 Mobile robot platforms for education -- 6.2.1 RoboDesigner -- 6.2.2 MiniWay -- 6.2.3 Learning outcomes -- 6.3 Research problems and trends -- 6.4 Closure -- 6.5 References.

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### Sommario/riassunto

Interdisciplinary work for engineering developments of mobile robots, in both old and new applications. This book and its companion can be used as a graduate level course books or guide books for the practicing engineer who is working on a specific problem which is described in one of the chapters.

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