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Nota di contenuto	Parallel Hamiltonian Formulation For Forward Dynamics Of Free-Flying Manipulators -- Nonlinear Model Predictive Control (NMPC) for free-floating space manipulator -- Performance control of a spacecraft-robotic arm system -- desired motion tracking -- Detection and decoding of AIS navigation messages by a Low Earth Orbit satellite -- Accurate Image Depth Determination for Autonomous Vehicle Navigation -- Pose Estimation for Mobile and Flying Robots via Vision System -- Control of Flexible Wing UAV Using Stereo Camera -- The dynamics aspects of modeling and control of the flying robot with attached two Degree of Freedom manipulator -- Prototype, Mathematical Model and Simulations of a Model-Making Rocket --

Space mining challenges: Expertise of the Polish entities and international perspective on future exploration missions -- Space mechatronics and space robotics patent inventions; the way to protect the space heritage in the Space Research Centre, Institute of the Polish Academy of Sciences.

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Sommario/riassunto

This book includes extended versions of original works on aerospace robotics presented at the Conference on Aerospace Robotics (CARO) in Warsaw. It presents recent advances in aerospace robotics, such as manipulators, which are widely used in space for orbital operations, for example, the Mobile Servicing System on the International Space Station and the Shuttle Remote Manipulator System. Such manipulators are operated by astronauts and mounted on large platforms, making the influence of manipulator motion on the state of the platform insignificant. Application of manipulators for capture maneuvers in unmanned On-Orbit Servicing or Active Debris Removal missions requires reliable control algorithms that take into account the free-floating nature of the manipulator-equipped spacecraft. As such the book presents possibilities for using space manipulators for exploration and a variety of space operations. Further, it discusses new methods for the control of autonomous unmanned aerial vehicles (UAV) using vision systems and sensor fusion methodologies. Such autonomous flying vehicles could be used for materials deliveries and emergencies, as well as surveying and servicing.

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