

Robot Manipulators: Mathematics, Programming, and Control (Artificial Intelligence)

Richard P. Paul

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Robot Manipulators: Mathematics, Programming, and Control (Artificial Intelligence) Richard P. Paul "Richard Paul is perhaps the world's leading authority on the science of robot manipulation. He has contributed to almost every aspect of the field. His impressive publication record includes important articles on the kinematics of robot arms, their dynamics, and their control. He has developed a succession of interesting ideas concerning representation, specifically the use of homogeneous matrices.... Paul's book is written in his usual clear style, and it contains numerous interesting examples."

—Patrick H. Winston and Mike Brady, editors, The MIT Press Artificial Intelligence Series

Robot Manipulators is firmly grounded on the theoretical principles of the subject and makes considerable use of vector and matrix methods in its development. It is the first full treatment to be published, and it is designed for graduate courses in robotics as well as for practicing engineers. Following an introduction, the book's ten chapters cover homogeneous transformations, defining transformation equations, solving transformation equations, differential transformation relationships, motion trajectories, dynamics, digital servo systems, force transformations, compliance, and manipulation languages.

Paul writes that the impact of robot manipulators on the workplace and the economy over the coming decade could be profound: "While currently available industrial robots will probably not have a major impact on manufacturing, a low-cost, mass-produced, sensor-controlled robot could have a revolutionary effect.... Such robots would represent the conclusion of the industrial revolution, replacing the type of labor required at its outset to perform the repetitive machine-linked tasks whose ideal performance is characterized by our conception of a robot, not a human. Based on current research work, laboratory demonstrations, and the general level of technology in this country, we believe that it is possible to achieve such a robot within the coming decade."



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Steven Page:

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