

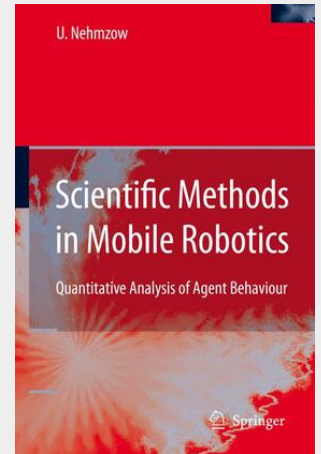
Nehmzow

Scientific Methods in Mobile Robotics

Quantitative Analysis of Agent Behaviour

Mobile robotics has until now focused on issues like design of controllers and robot hardware. It is now ready to embrace theoretical methods from dynamical systems theory, statistics and system identification to produce a formalized approach based on quantitative analyses and computer models of the interaction between robot, task and environment. This book is a step towards a theoretical understanding of the operation of autonomous mobile robots. It presents cutting-edge research on the application of chaos theory, parametric and non-parametric statistics and dynamical systems theory in this field. Practical examples and case studies show how robot behaviour can be logged, analysed, interpreted and modelled, aiding design of controllers, analysis of agent behaviour and verification of results. As the first book to apply advanced scientific methods to mobile robots it will interest researchers, lecturers and post-graduate students in robotics, artificial intelligence and cognitive science.

Mobile robotics is a cutting-edge research topic, which until recently has primarily focused on issues such as the design of controllers and robot hardware. The field is now ready to embrace theoretical methods from dynamical systems theory, statistics and system identification to produce quantitative analyses and computer models of robot-environment interaction. *Scientific Methods in Mobile Robotics: Quantitative Analysis of Agent Behaviour* is a decisive step towards a theoretical understanding of the operation of autonomous mobile robotics. This book presents cutting-edge research results on the application of chaos theory, parametric and non-parametric statistics and dynamical systems theory in mobile robotics. It presents foundations of a theory of mobile robotics by providing a quantitative analysis of the interaction between robot, task and environment. Practical examples and case studies show how robot behaviour can be logged, modelled, analysed and interpreted. This new approach will aid the design of controllers, analysis of agent behaviour and the verification of experimental results. As the first book to apply advanced scientific methods to the growing field of mobile robots, *Scientific Methods in Mobile Robotics: Quantitative Analysis of Agent Behaviour* will interest researchers, lecturers and post-graduate students in robotics, artificial intelligence and cognitive science.



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