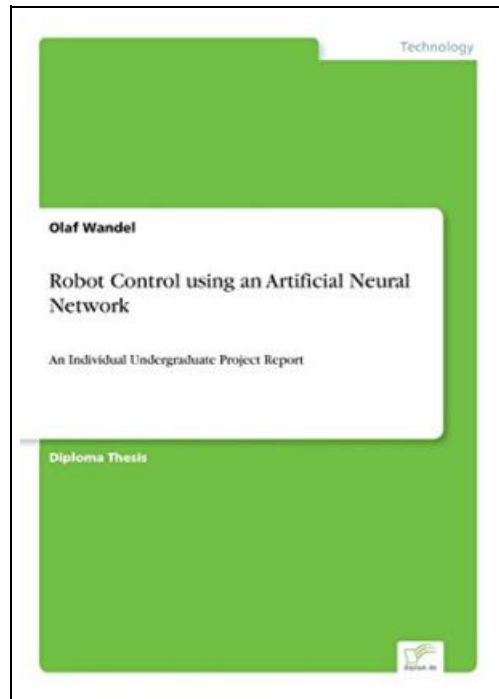


Robot Control Using an Artificial Neural Network



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Reviews

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ROBOT CONTROL USING AN ARTIFICIAL NEURAL NETWORK



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Diplom.de. Paperback. Condition: New. 54 pages. Dimensions: 10.4in. x 7.4in. x 0.1in. Diplomarbeit, die am 31. 05. 1997 erfolgreich an einer Fachhochschule in Deutschland im Fachbereich Allgemeiner Maschinenbau eingereicht wurde. Abstract: The aim of the project was to control three joints of an industrial robot in terms of its position, velocity and acceleration. The work considered the necessary hardware, principles of neural networks and controlling techniques. The hardware comprised of a robot with three DC-motors and three optical position encoders, a personal computer with a DA card for voltage output to the robot and two DD cards. One DD card for receiving values from the optical encoders and one for timing. The basics of artificial neural network type perceptrons were described. The special features bias, output feedback, momentum term, adjustment of momentum factor and adjustment of learning rate for this artificial neural network type were considered. An introduction to learning and control structures using artificial neural networks were given. These were controller copying, direct modelling, direct inverse modelling, control with a model and an inverse model, forward and inverse modelling, control action feedback error learning, feedback error learning, learning and control using the plants Jacobian. The conversion of two learning and control structures, direct inverse modelling and control action feedback error learning, was implemented in software using MS QuickBASIC 4. 5. One joint was controlled with a direct inverse model. One joint and all joints together were controlled with control action feedback error learning. The results of experiments with these learning and control structures were documented. Table of Contents: 1. Introduction 8 2. The hardware 9 2. 1The robot 9 2. 2The computer and the software 11 2. 3The PCL-726 DA card 11 2. 4The DD card 11 2. 5The PCL-812 DD card 12 2. 6The G64 rack 12 3. Neural networks 13 3. 1The neuron 13 3. 2Conversion of neural...



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