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Trajectory tracking of a 2-link robot manipulator using adaptive control [Modern Robotics, Chapter 11.1: Control System Overview](#) [Modern Robotics, Chapter 12: Grasping and Manipulation](#) [Linear Control, Spring 2020 - Adaptive Control](#) [Trajectory Planning for Robot Manipulators](#) [Model Reference Adaptive Control Fundamentals \(Dr. Tansel Yucelen\)](#) Decentralized Adaptive Control for Collaborative Manipulation [Adaptive Control Of Robot Manipulators](#)

Abstract: Adaptive control has been recognized as an effective approach for mechanical robot manipulator controller design due to the presence of nonlinearities and uncertainties in robot dynamic models. Numerous results addressing different aspects of the control problem have been reported in the literature in recent years.

[Adaptive control of robot manipulators - A review - IEEE ...](#)

A new adaptive robot control algorithm is derived, which consists of a PD feedback part and a full dynamics feedforward compensation part, with the unknown manipulator and payload parameters being estimated online. The algorithm is computationally simple, because of an effective exploitation of the structure of manipulator dynamics. In particular, it requires neither feedback of joint accelerations nor inversion of the estimated inertia matrix.

[On the Adaptive Control of Robot Manipulators - Jean ...](#)

In this paper, a wavelet-based adaptive control is proposed for a class of robotic manipulators, which consist of nonlinearities for friction effects and uncertain terms as disturbances.

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(PDF) Adaptive Control of Robot Manipulators Based on ...

Abstract In this paper, we propose multiple parameter models based adaptive switching control system for robot manipulators. We first uniformly distribute the parameter set into a finite number of...

(PDF) Adaptive Control for Robot Manipulators using ...

Abstract: In this note, we investigate the adaptive control problem for robot manipulators with both the uncertain kinematics and dynamics. We propose two adaptive control schemes to realize the objective of task-space trajectory tracking irrespective of the uncertain kinematics and dynamics.

Adaptive Control of Robot Manipulators With Uncertain ...

In this paper, we mainly solve the adaptive control problem of robot manipulators with uncertain kinematics, dynamics, and actuators parameters, which has been a long-standing, yet unsolved problem in the robotics field, because of the technical difficulties in handling highly coupled effect between control torque and the mentioned uncertainties.

Inverse Jacobian Adaptive Tracking Control of Robot ...

The adaptive robot controller design problem is as follows: given the desired trajectories $q_d(t)$, $\dot{q}_d(t)$, $\ddot{q}_d(t)$, measurements of the joint position q and velocity \dot{q} , and with some or all the manipulator parameters being unknown, derive a control law for the actuator torque τ , and an adaptation law for the unknown parameters, such that the manipulator joint position $q(t)$ closely track the ...

Composite adaptive control of robot manipulators ...

Dynamic Learning From Adaptive Neural Control of Robot Manipulators With Prescribed Performance
January 2017 IEEE Transactions on Systems, Man, and Cybernetics: Systems PP(99):1-12

Dynamic Learning From Adaptive Neural Control of Robot ...

Abstract In this paper, we propose some adaptive iterative learning control (ILC) schemes for trajectory tracking of rigid robot manipulators, with unknown parameters, performing repetitive tasks.

Adaptive iterative learning control for robot manipulators ...

Computer simulation results are given for a planar four degree of freedom redundant robot under adaptive impedance control. These results demonstrate that accurate end effector impedance control and effective redundancy utilization can be achieved simultaneously by using the proposed controller.

Direct adaptive impedance control of robot manipulators ...

In this paper, an adaptive neural control based on a radial basis function neural network (RBFNN) will be proposed for robotic manipulators to achieve guaranteed tracking control and estimation. Firstly, since the measurement of joint accelerations is sensitive to the external noise, we aim to avoid using the acceleration signals directly by reformulating the robotic model.

Adaptive Neural Tracking Control of Robotic Manipulators ...

Abstract: This paper presents dynamic learning from adaptive neural control (ANC) with prescribed tracking error performance for an n-link robot manipulator subjected to unknown system dynamics and external disturbances. To achieve the prescribed performance, a performance function is introduced to describe the performance restrictions on tracking errors, and then specific performance requirements are served as a priori condition of tracking control design.

Dynamic Learning From Adaptive Neural Control of Robot ...

We can see the art of control in literature to overcome uncertainties, nonlinearities, and couplings from different aspects in the robust control of robot manipulators as surveyed in. As an...

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This paper presents a fuzzy adaptive control suitable for motion control of multi-link robot manipulators with structured and unstructured uncertainties. When joint velocities are available, full state fuzzy adaptive feedback control is designed to ensure the stability of the closed loop dynamic.

Observer-based adaptive control of robot manipulators ...

In this article, an adaptive NN control scheme is proposed for a category of uncertain robotic manipulators with unknown external disturbance and time-varying output constraints. Adaptive NNs are used to approximate the unknown closed-loop dynamics and external disturbance.

Adaptive neural network control of uncertain robotic ...

Such a control formula tion yields a controller that suppresses disturbances and tracks desired trajectories uniformly in all configurations of the manipulator. Use of a poor dynamic model with this kind of model-based decoupling and linearizing scheme, however, may result in performance that is inferior to a much simpler, fixed-gain scheme.

Adaptive Control of Mechanical Manipulators - John J ...

First, a neural network-based sliding mode adaptive control (NNSMAC), which is a combination of sliding mode technique, neural network (NN) approximation and adaptive technique, is designed to ensure trajectory tracking by the robot manipulator. It is shown using the Lyapunov theory that the tracking error asymptotically converge to zero.

Neural network-based sliding mode adaptive control for ...

An adaptive backstepping control scheme is proposed for task-space trajectory tracking of robot manipulators in the presence of uncertain parameters and external disturbances. In the case of...

Adaptive backstepping trajectory tracking control of robot ...

ties.¹⁹ In the study by Yang et al.,² a NN control method was proposed for robotic manipulators based on an obser-ver, where the proposed method is very effective for can-celing the effect of external disturbance and has very good robustness. To enhance the control performance for robotic manipulators, Deng¹⁰ proposed an adaptive fuzzy control

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