Fuzzy PI-PLL Control for DC Motors

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A phase lock loop (PLL) circuit is a well-known electronic circuit in communication engineering and other areas. In this paper, we present application of the PLL and fuzzy logic for DC motor control which are mixed well to be more effective for motor control. With this scheme, the control system can reach the set point rapidly, especially, it can eliminate noises. In addition, the PLL makes the system to have more stability; whereas, fuzzy logic controls helping PLL to be able to lock rapidly for a good response. The experiment result shows that the proposed control system works more efficacious. By performance comparison between the pure PLL control and the hybrid architecture of PLL with the fuzzy control, the result reveals the hybrid control...

A Learning Controller for Gate Control of Biped Walking Robot using Fourier Series Approximation

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A learning controller is presented for repetitive walking motion of biped robot. The learning control scheme learns the approximate inverse dynamics input of biped walking robot and uses the learned input pattern to generate an input profile of different walking motion from that learnt. In the learning controller, the PID feedback controller takes part in stabilizing the transient response of robot dynamics while the feedforward−d learning controller plays a role in computing the desired actuator torques for feedforward nonlinear dynamics compensation in steady state. It is shown that all the error signals in the learning control system are bounded and the robot motion trajectory converges to the desired one asymptotically. The proposed learning control scheme is...

Safe and Comfortable Electromotive Cart for People of Advanced Age

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When the people of advanced age drive the public electromotive cart of tricycle type on the slant and bumpy roads, the viewing angle of driver changes at the different directions. So the risk of traffic accident is increased. For the improvement of the above problem, we had produced the first experimental cart installed to the new driver's seat based on the Zn control theory. Based on the results of the driving test for the first experimental cart, we have produced the safe and comfortable electromotive cart.

3-DOF Attitude Control of a Model Helicopter based on Explicit Decoupling and Adaptive Control Scheme

M. S. Park and S.K. Hong
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This paper describes a 3-DOF attitude control of a small model helicopter in hover through explicit decoupling and adaptive control scheme. A model helicopter mounted on gimbal-stand is considered as a system that has 3 independent SISO systems representing motions about roll, pitch and yaw axis and these subsystems are identified from the test flight data. In this consideration, the contribution of others to yaw channel is neglected since it is relatively small. Two PID controllers based on Ziegler-Nichols method are designed for roll pitch channels independently. Also, adaptive fuzzy tuner is designed and applied to those PID controllers to cope with coupling effects between each channel and system uncertainties due to variation of engine RPM. The experimental results show that the attitude control...