Control Theory and its Application to Robot Control Systems

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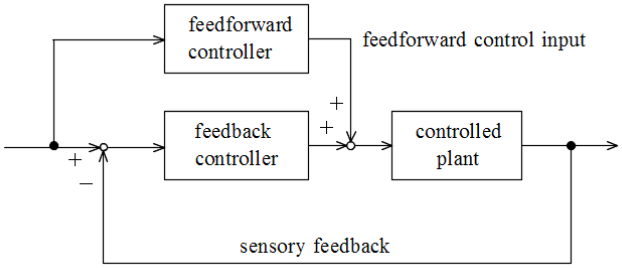
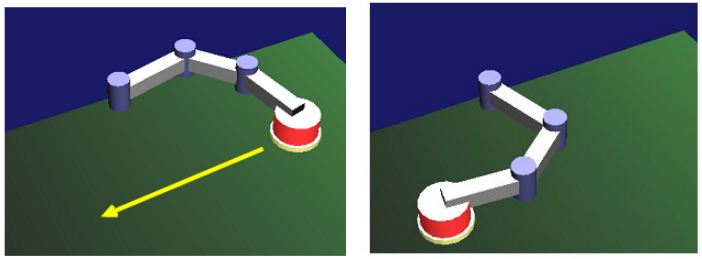
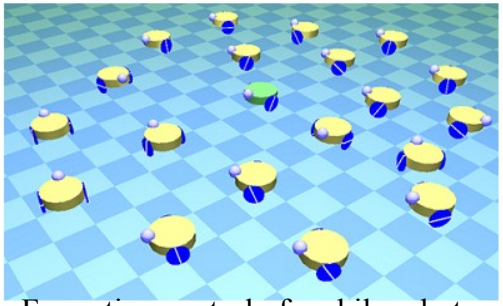


Two-degree-of-freedom control system



control of robot manipulator



Formation control of mobile robots

Content :

Control system design based on control theory is crucial to develop mechanical systems, such as robot manipulator, mobile robots, and robot vision systems. In the system design, the controlled system is described by a differential equation and dynamics of the systems is analyzed theoretically. To improve the system response, feedback controller is designed utilizing the differential equation and considering stability and performance of the feedback system.

We consider control theory of dynamical systems, and apply the theory to mechanical systems. Bio-mimetic control based on human brain is applied to robot manipulators. Simulators for robot control systems are also developed using three dimensional computer graphics.

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