

Control Methods

Categories

Model-based control

Model-free control

Controller based on impedance control theory (Keppler et al., 2021)

Bayesian optimization and Gaussian process learning (Demir et al., 2021)

Adaptive passive control + high gain observer (Azizkhani et al., 2022)

Model-free control based on electromyographic signals &
Force control based on inverse dynamics (Lotti et al., 2022)

Adaptive Backstepping Sliding Mode Controller (Mazare et al., 2022)

PID + iterative learning controllers (Xu et al., 2022)

Soft Actor-Critic reinforcement learning algorithm + PID controller
(Robbins et al., 2022)

Model predictive control + data-driven compensation model error
(He et al., 2023)

Adaptive neural network controller based on the backstepping method
(Yang et al., 2023b)

Fractional-order sliding surface and deep reinforcement learning
(Moezi et al., 2024)

Discrete wavelet neural network + PID controller
(Ramos-Velasco et al., 2024)

Probabilistic model predictive control and nonparametric learning
(Tang et al., 2024)

Iterative learning controller (Pierallini et al., 2025)

Application effects

Enhance stability

Suppress disturbance

Improve control accuracy

Accelerate response speed

Attenuate signal oscillation

Improve dynamic adaptability