Abstract

Traveling wave piezoelectric ultrasonic motors (PUMs) are ideal actuators for a variety of important applications including medical and space robotics, haptic interfaces, and positioning devices. Consisting of a single moving part, the motors are much simpler mechanically than other drive systems that require transmissions and brakes. Many potential PUM applications require accurate real-time control of output torque, which is difficult due to the highly nonlinear PUM dynamics. This paper presents an algorithm that adjusts PUM drive signal frequency to achieve output torque control throughout the speed range of a typical commercial PUM.

Citation