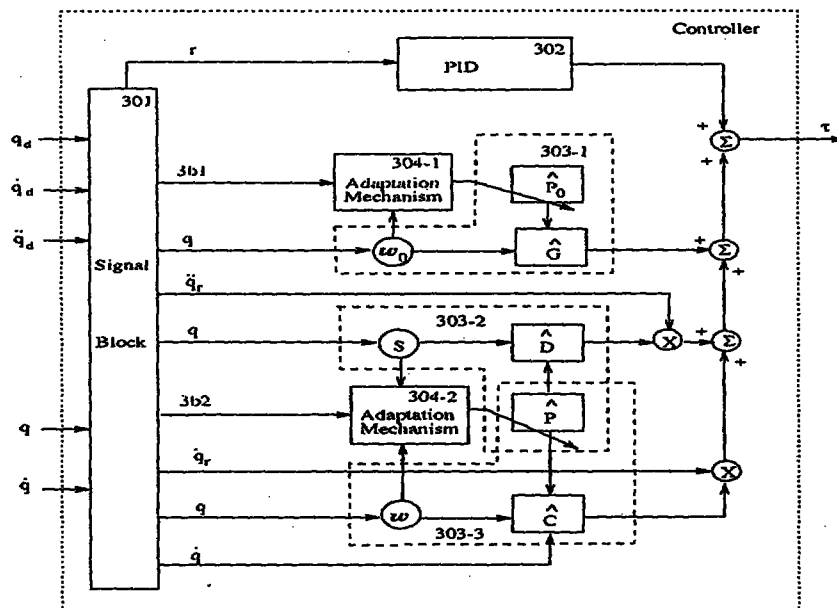


Patent Cited:

5,268,834 12/1993 Sanner and Slotine Stable Adaptive Neural Network Controller

Abstract:

Two new parametric network models for multi-degrees-of-freedom mechanical systems are presented based on systems' own functions. The networks are only used to model the inertia matrix $D(q)$ and the potential energy $V(q)$ (or the gravitational forces $G(q)$), which are functions of position q only. Static networks are therefore sufficient to model them. The complete dynamics of robots are constructed based on the networks for $D(q)$ and $V(q)$ (or $G(q)$). Subsequently, a general adaptive controller based on the resulting prescribed network models is given. It can be shown that all the closed-loop signals are bounded and tracking error goes to zero. Further, with the inventive techniques, adaptive controller design for robots and the like becomes simply a construction of networks and there is no need for dynamic modeling.



One preferred embodiment of the present invention