

Multivariable Robust Control of a Gait Trainer

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Abstract

This paper proposes multivariable robust control for a gait trainer for people with walking disability. The gait trainer composes of linkages and motors, which drive the linkages to produce preferred gait traces. To simplify the traditional motor control, the tracking error and motor current are feedback for control design to regulate the motor voltage. First, the transfer function matrices of the multivariable system are obtained by identification techniques. Then robust control algorithms are applied to deal with system variations and disturbances. Finally, the designed controllers are implemented for performance verification. From the experimental results, the proposed multivariable robust control is shown to be effective for the gait trainer.