Closed-loop model identification of cooperative manipulators holding deformable objects

Abstract

This paper presents system identification to obtain the closed-loop models of a couple of cooperative manipulators in a system, which functions to hold deformable objects. The system works using the master-slave principle; in other words, one of the manipulators is positioned controlled through encoder feedback, while a force sensor gives feedback to the other force-controlled manipulator. Using the closed-loop input and output data, the closed-loop models, which are useful for the model-based control design, are estimated. The criteria for model validation is a 0.936 fit between the measured and simulated output of the estimated models and residual analysis. The results show that for both position and force control respectively, the fits are 95.3% and 90.83%. © Published under license by IOP Publishing Ltd.

Indexed keywords

Engineering controlled term: System identification
Manufacturing: Manufacturing process
Compounded keywords: Closed-loop model, Cooperative manipulators, Deformable objects, Encoder and actuator, Master–slave principle

References

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