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### 3.3 Synchronization controller based on estimated variables

3.3.1 Feedback control law ; 3.3.2 An observer for the synchronization errors ; 3.3.3

An observer for the slave joint variables

; 3.3.4 Synchronization closed loop error dynamics

; 3.3.5 Stability analysis

3.4 Gain tuning procedure

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#### Sommario/riassunto

The main goal of this book is to prove analytically and validate experimentally that synchronization in multi-composed mechanical systems can be achieved in the case of partial knowledge of the state vector of the systems, i.e. when only positions are measured. For this purpose, synchronization schemes based on interconnections between the systems, feedback controllers and observers are proposed. Because mechanical systems include a large variety of systems, and since it is impossible to address all of them, the book focuses on robot manipulators. Nonetheless the ideas developed here can be

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