

Electro-hydraulic actuation systems: design, testing, identification and validation

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=9999920521403&lokasi=lokal>

Abstrak

The book serves as a unique integrated platform, which not only describes the design methodology of electro-hydraulic actuation systems but also provides insights into the design of the servo valve, which is the most important component in the system. It presents a step-by-step design process, comparative tables, illustrative figures, and detailed explanations. The book focuses on the design and testing of electro-hydraulic actuation systems, which are increasingly being used in motion control applications, particularly in those where precision actuation at high operational rates is of prime importance. It describes in detail the design philosophy of such high-performance systems, presenting a system used as a physical test setup together with experimental results to corroborate the calculations. Of particular interest are the electro-hydraulic servo valves that form the heart of these actuations. These valves are complex and not much data is available in open literature due to OEM propriety issues. In this context, the book discusses the elaborate mathematical models that have been derived and an approach to validate the mathematical models with test results. Presenting the complex methodology in simple language, it will prove to be a valuable resource for students, researchers, and professional engineers alike.