15th INTERNATIONAL CONFERENCE
Dynamical Systems — Theory and Applications
December 2-5, 2019. Lodz, POLAND.

DSTA 2019

paper id: MTR160

Modeling of electro-hydraulic servo-drive for advanced control system design

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Abstract: The paper describes the synthesis of a mathematical model of the electro-hydraulic servo-drive. Due to the complexity of the electro-hydraulic servo-drive system and the difficulty in determining all system's coefficients, the simplification of the mathematical model is proposed. The model includes different nonlinearities such as the friction or the pressure-dependent oil bulk module. The simulation results are presented, and the comparison with the data collected from the real servo drive is discussed. With the proposed methodology it was possible to choose the values of physical parameters such that the real electro-hydraulic servo-drive is modeled with the accuracy suitable for the fast prototyping and design of the advanced control system.

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