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Genetic algorithm based method of elimination of residual oscillation in mechatronic systems. (English) Zbl 1249.93127

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Summary: The paper presents control signals generation methods, preventing the excitation of residual vibration in slightly damped oscillational systems. It is focused on the feedforward methods, as most of the vibrations in examined processes are induced by the control, while the influence of disturbances is mostly negligible. Application of these methods involves ensuring of the insensitivity to natural frequency change, which can be reached in classical approach only by considerable increase of transient response duration. Genetic algorithms can be effectively applied for the numerical optimization of developed shaper while maintaining the insensitivity to parameter change and short time delay.

MSC:

93C83 Control/observation systems involving computers (process control, etc.)
90C59 Approximation methods and heuristics in mathematical programming
93B40 Computational methods in systems theory (MSC2010)

Keywords:

elimination of residual vibration; input signal shaping; genetic algorithm

Full Text: Link EuDML

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