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A class of low-pass FIR input shaping filters achieving exact residual vibration cancelation.
(English) [Zbl 1257.93040](#)
Automatica 48, No. 9, 2377-2380 (2012).

Summary: This paper describes the construction of low-pass FIR filters for application as command input shapers in motion control systems. The filters are designed to operate on an arbitrary command input signal to ensure a finite settling time for system modes with known natural frequency and damping ratio. In addition, the required roll-off rate of the filter frequency response may be prescribed in the design. Excitation of unmodeled high-frequency modes can thereby be reduced. The filters also produce an input-smoothing effect that is useful in situations where discontinuities in the input signal or its derivatives would be detrimental to system performance or function. Numerical case studies are presented to clarify these effects.

MSC:

93B51 Design techniques (robust design, computer-aided design, etc.)
70Q05 Control of mechanical systems
93C85 Automated systems (robots, etc.) in control theory

Cited in **3** Documents

Keywords:

[input shaping](#); [motion control](#); [flexible structure vibration](#); [robot manipulator](#); [feedforward control](#)

Full Text: [DOI](#)

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