

Adaptive Youla-Kucera Parametrization for Active Vibration and Noise Attenuation

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Abstract

Noise and vibration attenuation is a growing concern in today's human activities. Passive attenuation of noise and vibration via dedicated absorbers has serious limitations. To fully answer the current problem of noise and vibration attenuation, active control solutions should be considered. A significant difficulty arises as a consequence of large environmental uncertainties in terms of characteristics and variability of the noise and vibrations to be attenuated. New control paradigms emerged for solving these problems.

Adaptive Youla-Kucera parametrization plays a fundamental role in solving the problem of attenuation of noise and vibrations with unknown and time-varying characteristics. This concerns both attenuation by feedback (for multiple tonal and narrow band noise and vibrations) as well as the feedforward compensation when an image of the disturbing noise or vibration is available (structure used for the attenuation of broad band noise or vibrations).

The talk will review some basic algorithms and will emphasize the advantages of using adaptive Youla-Kucera parametrization. The performance of these algorithms will be illustrated by experimental results in active vibration and noise attenuation.