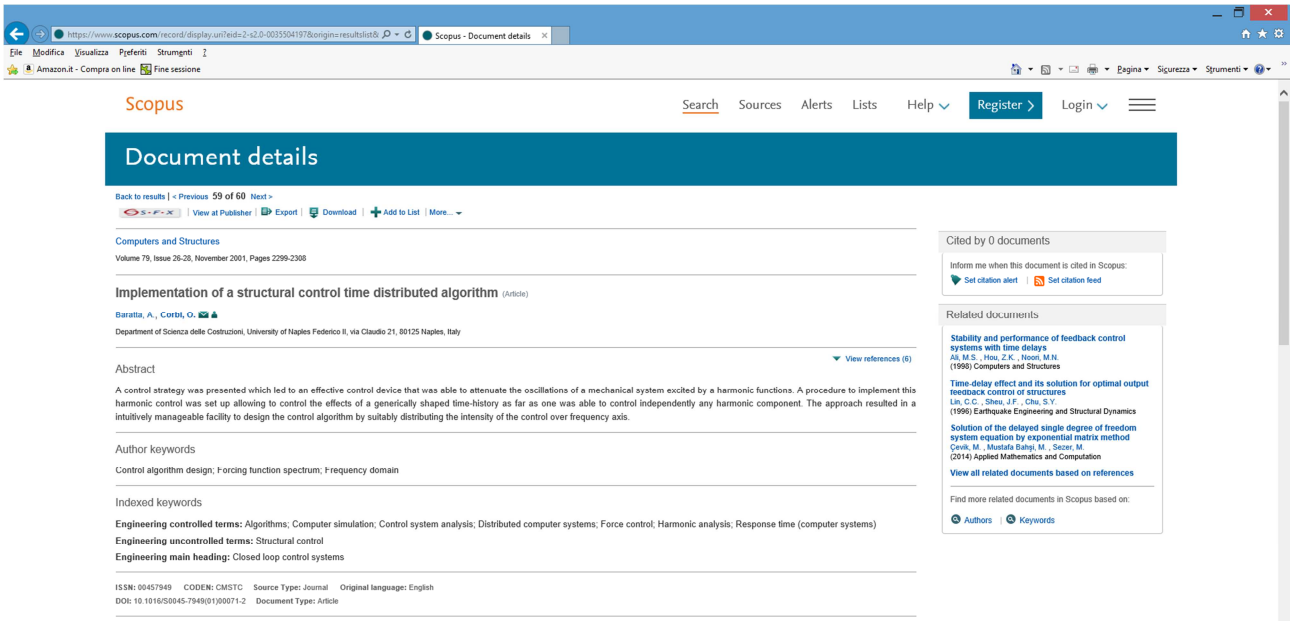
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Computers and Structures
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Implementation of a structural control time distributed algorithm (Article)
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Abstract
A control strategy was presented which led to an effective control device that was able to attenuate the oscillations of a mechanical system excited by a harmonic functions. A procedure to implement this harmonic control was set up allowing to control the effects of a generically shaped time-history as far as one was able to control independently any harmonic component. The approach resulted in a intuitively manageable facility to design the control algorithm by suitably distributing the intensity of the control over frequency axis.
Author keywords
Control algorithm design; Forcing function spectrum; Frequency domain
Indexed keywords
Engineering controlled terms: Algorithms; Computer simulation; Control system analysis; Distributed computer systems; Force control; Harmonic analysis; Response time (computer systems)
Engineering uncontrolled terms: Structural control
Engineering main heading: Closed loop control systems
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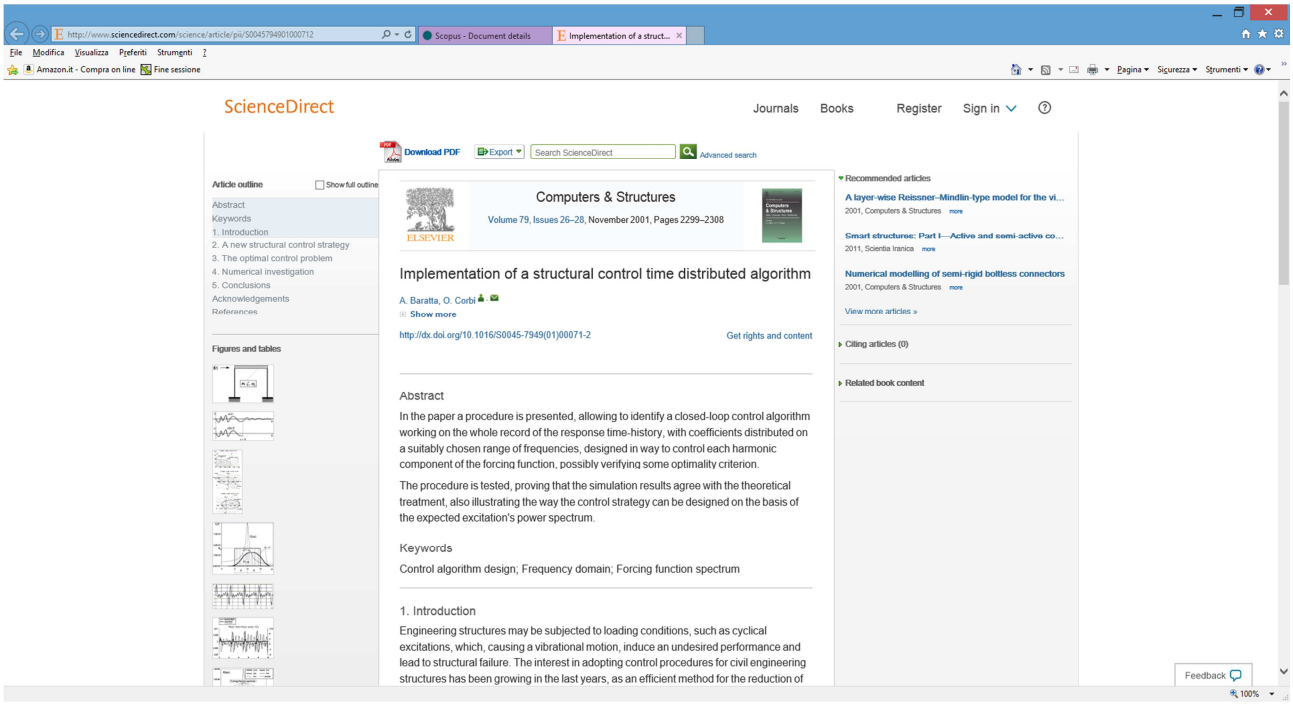
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Article outline
Abstract
Keywords
1. Introduction
2. A new structural control strategy
3. The optimal control problem
4. Numerical investigation
5. Conclusions
Acknowledgements
References
Figures and tables
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Abstract
In the paper a procedure is presented, allowing to identify a closed-loop control algorithm working on the whole record of the response time-history, with coefficients distributed on a suitably chosen range of frequencies, designed in way to control each harmonic component of the forcing function, possibly verifying some optimality criterion.
The procedure is tested, proving that the simulation results agree with the theoretical treatment, also illustrating the way the control strategy can be designed on the basis of the expected excitation's power spectrum.
Keywords
Control algorithm design; Frequency domain; Forcing function spectrum
1. Introduction
Engineering structures may be subjected to loading conditions, such as cyclical excitations, which, causing a vibrational motion, induce an undesired performance and lead to structural failure. The interest in adopting control procedures for civil engineering structures has been growing in the last years, as an efficient method for the reduction of
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