

## Vibration control of a flexible structure with electromagnetic actuators - DTU Orbit (08/11/2017)

### Vibration control of a flexible structure with electromagnetic actuators

This work presents the model of a shear-frame-type structure composed of six flexible beams and three rigid masses. Fixed on the ground, outside the structure, two voltage-controlled electromagnetic actuators are used for vibration control. To model the flexible beams, unidimensional finite elements were used. Nonlinear equations for the actuator electromagnetic force, noise in the position sensor, time delays for the control signal update and voltage saturation were also considered in the model. For controlling purposes, a discrete linear quadratic regulator combined with a predictive full-order discrete linear observer was employed. Results of numerical simulations, where the structure is submitted to an impulsive disturbance force and to a harmonic force, show that the oscillations can be significantly reduced with the use of the electromagnetic actuators.

### General information

State: Published

Organisations: Department of Mechanical Engineering, Solid Mechanics, Military Institute of Engineering

Authors: Gruzman, M. (Ekstern), Santos, I. (Intern)

Pages: 1131-1142

Publication date: 2016

Main Research Area: Technical/natural sciences

### Publication information

Journal: Brazilian Society of Mechanical Sciences and Engineering. Journal

Volume: 38

Issue number: 4

ISSN (Print): 1678-5878

Ratings:

BFI (2017): BFI-level 1

Web of Science (2017): Indexed Yes

BFI (2016): BFI-level 1

Scopus rating (2016): SJR 0.274 SNIP 0.692 CiteScore 1.04

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 0.235 SNIP 0.549 CiteScore 0.67

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 0.247 SNIP 0.709 CiteScore 0.62

BFI (2013): BFI-level 1

Scopus rating (2013): SJR 0.268 SNIP 0.528 CiteScore 0.42

ISI indexed (2013): ISI indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): SJR 0.218 SNIP 0.533 CiteScore 0.3

ISI indexed (2012): ISI indexed yes

BFI (2011): BFI-level 1

Scopus rating (2011): SJR 0.234 SNIP 0.487 CiteScore 0.37

ISI indexed (2011): ISI indexed no

BFI (2010): BFI-level 1

Scopus rating (2010): SJR 0.256 SNIP 0.561

BFI (2009): BFI-level 1

Scopus rating (2009): SJR 0.259 SNIP 0.462

BFI (2008): BFI-level 1

Scopus rating (2008): SJR 0.181 SNIP 0.322

Scopus rating (2007): SJR 0.223 SNIP 0.451

Scopus rating (2006): SJR 0.253 SNIP 0.696

Scopus rating (2005): SJR 0.272 SNIP 0.384

Scopus rating (2004): SJR 0.122 SNIP 0.127

Scopus rating (2003): SJR 0.171 SNIP 0.227

Scopus rating (2002): SJR 0.167 SNIP 0.152

Scopus rating (2001): SJR 0.164 SNIP 0.241

Scopus rating (2000): SJR 0.169 SNIP 0.123

Scopus rating (1999): SJR 0.139 SNIP 0.279

Original language: English

Structures, Vibration control, Electromagnetic actuators, Discrete linear quadratic regulator

DOIs:

10.1007/s40430-015-0438-x

Source: FindIt

Source-ID: 2285492133

Publication: Research - peer-review › Journal article – Annual report year: 2016