
ABSTRACTS

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SELECTION OF THE CRACK DRIVING FORCE CONCEPT IN CONTEXT OF LINEAR-ELASTIC AND ELASTIC-PLASTIC FRACTURE MECHANICS

(pages 1-6)

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Keywords: fracture mechanics, crack driving force, yielding

Abstract: Fracture mechanics is a continuum mechanics approach to describe cracks in materials. There are plenty of fracture mechanics concepts such as linear elastic fracture mechanics (LEFM), elastic-plastic fracture mechanics (E-PFM), dynamic, the time-dependent fracture mechanics that are limited to specific loading conditions, crack geometry (length) and material behaviour. Current paper evaluates applicability of a crack driving force in context of LEFM and E-PFM for arbitrary (quasi-static) loading and yielding conditions to help engineers choose appropriate fracture mechanics concept for their applications.

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SNAKE-LIKE ROBOTS

(pages 7-10)

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Keywords: mechatronics, education, embedded systems

Abstract: The paper deals with snake-like robots. There are several types of snake-like locomotions. Biological example – snake always select the best type of locomotion in accordance with terrain. Big manoeuvrability leads many teams to develop snake-like robots. These structures have many degree of freedom and it is complicated to control them.

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DESIGN OF BODY WHEEL SHAPE TO IMPROVE TEETH STIFFNESS FOR GEARBOX OF MECHATRONIC SYSTEMS

(pages 11-14)

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Keywords: mechatronics, gearbox, teeth deformation, spur gear, finite element method

Abstract: The most important component of your drive systems of mechatronic units are geared systems. Prospective application of highly accurate transfers it can be examined by the need to adapt to our own design, size and the minimum weight transfer. It is anticipated construction material so flow density, high stiffness, reliability, positioning, control. Increasing performance and improving load machines with gear unit leads to increase the technical level of machines. This process is often at the cost of degradation of the environment. One of the factors that aggravate environmental is a noise. Periodic changes the stiffness of the tooth during meshing in gear drives mainly affects of the noise in the transfer. The work is devoted to the analysis of influence of the body wheel shape on the tooth stiffness. The problem is solved for spur gears. As the basis for calculating the tooth stiffness are results of teeth deformation. The teeth deformation has be solution problem by finite element method.

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THE ASPECTS OF STRESS ANALYSIS PERFORMED BY DIGITAL IMAGE CORRELATION METHOD RELATED WITH SMOOTHING AND ITS INFLUENCE ON THE RESULTS

(pages 15-21)

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Keywords: digital image correlation, stress analysis, smoothing, local regression, Kernel size

Abstract: The paper deals with a description of the aspects of stress analysis performed by 2D or 3D digital image correlation system. It describes the differences between the types of smoothing used in Istra4D that is a software commercially delivered with correlation systems Dantec Dynamics. The analysis was performed on flat specimen made from PSM-1 material used in photoelasticity method. By loading of the specimen in form of three-point bending, a proper dependence between the facet size set for correlation of the images and level of local regression filter (characterized by a kernel size) was found. The finding for mentioned dependence was realised by comparison of the results with the results obtained numerically in Ansys Workbench 17.0.
