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VILNIUS GEDIMINAS TECHNICAL UNIVERSITY
INSTITUTE OF MECHANICS
LITHUANIAN ASSOCIATION OF COMPUTATIONAL MECHANICS

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15th of May 2020, 12:00 Vilnius Gediminas Technical University
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ZOOM link: https://liedm.zoom.us/j/98471291936)

ABSTRACTS

(the language of abstracts is not edited)

Simona Bukantaitė (KTU, Faculty of Mechanical Engineering and Design, Department of Production Eng ineering)

A title of the presentation:

Simona Bukantaitė „Factors for the Modernization of Smart Production Processes“

ABSTRACT:

A business has to generate systematic plans to ensure that it gets their products in the market with lower costs and efficiently scale to meet the market demand. It also needs to strategically extend the profitable duration of the product maturity and ensure maximum profitability even as the product sales begin to decline. Business needs to maintain high levels of collaboration among supply chain team members and customers and ensure communication of data such as design, quality and manufacturing. To implement all these ideas, companies should think of connected processes which could be easily managed to every responsible person. The evolution of Industry 4.0 does not let companies to stay as they were years before. Digitalisation give easier access to needed data so it is simply to provide information to software which will provide support for all product-related processes. So production must become smart and to get in this point all processes should be modelledand updatedcorrectly.In this presentation, main factors are described which should be considered when making a desicion of modernization.

Giedrius Jočbalis (VGTU, Antano Gustaičio Aviacijos institutas)

A title of the presentation:

Giedrius Jočbalis „Dalelės - paviršiaus kontaktas, elastinių bangų įtaka“

ABSTRACT:

Dalelės - paviršiaus kontaktas prie mažų greičių plačiai nagrinėjamas mokslinėje literatūroje, tačiau jį sudėtinga apibrėžti prie didesnių greičių dėl daugelio veiksnių. Vienas iš tų veiksnių yra dalelės kinetinės energijos disipacija elastinėmis bangomis storame pagrinde. Pranešime nagrinėjama elastinio paviršiaus pagrindo storio įtaka 40 μm skersmens dalelės restitucijos koeficientui prie sąlyginai didelių 2, 20, 200 ir 500 m/s smūgio greičių. Modeliuojant elastinį kontaktą prie kai kurių iš greičių pastebimas dalelės restitucijos koeficiento sumažėjimas, priklausantis nuo modeliuojamo paviršiaus pagrindo storio. Pagrindo storinimas nustoja daryti įtaką nuo 100 μm.

Shashikanth Chakilam (KTU, Faculty of Mechanical Engineering and Design)

A title of the presentation:

Shashikanth Chakilam, Rimvydas Gaidys, Audrone Lupeikienė „Mechanical distortion of bio inspired artificial hair flow sensors“

ABSTRACT:

Arthropods like Spiders, Cricket insects have mechanical interaction with the environment and exposed to various physical parameters such as flow, pressure, heat etc. These have sophisticated mechanosensory systems to sense the physical parameters and take the necessary actions accordingly. In this paper, main focus is on the study of biomechanical aspects like physiology, morphology, development of the mechanoreceptor i.e Hair (Sensilla) and its mechanics when the flow is applied on it and how this deflects or deforms when air is passed through that hair. After this deflection how this information is been transferred from the hair which is on the outer body surface to the brain neurophysics.

Then design of the artificial hair cell based on the above structural study of original mechanoreceptor in solid works and analysis of the mechanical distortion of that Artificial hair cell.

Oleksandr Hubanov (VGTU, Faculty of Civil Engineering)

A title of the presentation:

R. Kačianauskas, **O. Hubanov** “Simulation of biological rope as an numerical experiment”

ABSTRACT:

Mitral valve it is biological fibrous structural membrane and main goal of my PhD is to get mathematical model of whole mitral valve, which takes into account: blood pressure, contact of points and real geometry of valve. This model will allow simulating the normal and pathology state of the valve. In addition, this model will allow controlling the geometry of the valve by using artificial chordae. Researches on this subject with the Finite element method (FEM) has been conducted a long time ago, but the Mass-Spring model (MSM), was used for the modeling of a soft biological membrane, for the first time around 2014 year. The same model is used in computer game industry since early 2000, for simulating realistic hair and cloth movement.

Paulius Skėrys (Siauliai University).

A title of the presentation:

Rimvydas Gaidys, **Paulius Skėrys**, Audrone Lupeikienė “Design and analysis of the active element for vibration energy harvester”

ABSTRACT:

Piezoelectric cantilevers have been widely used as promising generators of electrical energy in micro wireless and portable devices, particularly in low-power and low-vibration conditions, by harvesting the ambient vibration energy. The present work was carried out in order to maximize normal strain distribution on the layer of the vibration harvester active element, by optimising the geometry of a cantilever. The three configurations of the active element were analysed: a fixed cross section, a fixed cross section with additional mass at the end and an optimized cross section. The optimization procedure of normal strain maximization and the active element geometry are presented. Statics and dynamics characteristics such as eigenmodes, distribution of the strain along the active element are analysed.

Olga Chabarova (VGTU, Statybos fakultetas, Taikomosios mechanikos katedra)

A title of the presentation:

Olga Chabarova „Žmogaus stuburo fragmento stabilumo tyrimas“

ABSTRACT:

Medicininiu požiūriu, žalinga stuburo slankstelių degeneracija yra viena iš pagrindinių sveikatos problemų. Mechaniniu požiūriu, stuburo pažaidos gali atsirasti dėl keleto priežasčių. Tyrimai rodo, kad dalį pažaidų sukelia stabilumo praradimas. Nestabilumo rizika didėja senstant, kai keičiasi ne tik jų audinių mechaninės savybės, bet stebimi mikroskopiniai ar net makroskopiniai geometrijos pokyčiai. Tyrimais įrodyta, kad slankstelių lūžiai stipriai koreliuoja su osteoporozės vykstančių kaulų tankio mažėjimu ir tarpslankstelinių diskų savybių degeneracija. Šie efektai veda prie stebimų geometrijos pokyčių, pavyzdžiui, kaulinio slankstelių kevalo ar minkštojo disko plonėjimo, turinčių tiesioginį poveikį struktūros stabilumui.

Tyrimų objektas yra žmogaus stuburo juosmens dalies fragmentas. Šis fragmentas bus nagrinėjamas kaip deformuojama mechaninė struktūra. Tokia nevienalytė struktūra yra sudaryta iš kietųjų kaulinių elementų (slankstelių) ir minkštųjų audinių (tarpslankstelinių diskų). Tokia sistema yra jautri galimiems nestabilumams.
