



ADMITERE DOCTORAT

Sesiunea Septembrie 2023

Domeniul de doctorat: *Inginerie mecanică*

Conducător doctorat: *Silviu BUTNARIU*

TEME (TEMATICĂ) PENTRU CONCURS

TEMA 1: *Studii asupra nivelului de siguranță pasivă a vehiculului post-accident*

Conținut / Principalele aspecte abordate

Strategii de scanare, segmentare și modelare a corpurilor de tip suprafață (elemente de caroserie a autovehiculelor).

Analiza deformațiilor plastice sub acțiunea solicitărilor dinamice.

Analiza metodelor de reparație a elementelor deformate plastic.

Analiza plasticității caroseriei și a coeficientului de restituire.

Bibliografie recomandată:

1. Butnariu S., Analysis of mechanical structures using finite element method, lecture notes, ISBN 978-606-19-0311-5 (CD), Ed. Universitatii Transilvania din Brasov, 2013
2. Butnariu, S., Mogan, Gh., Analiza cu elemente finite în ingineria mecanică.. Aplicații practice în ANSYS, Ed. Universității Transilvania, ISBN 978-606-19-0474-7 (print), 2014
3. Butnariu, S., VR technologies for scanning, 3D reconstruction and tracking-lecture notes, CD, ISBN: 978-973-131-340-5, Ed. Lux Libris, 2016
4. Hadryś, D., and M. Miros, Coefficient of restitution of model repaired car body parts. Journal of Achievements in Material and Manufacturing Engineering 28.1 (2008): 51-54.
5. Schuh, Benjamin, et al. Mechanical properties, microstructure and thermal stability of a nanocrystalline CoCrFeMnNi high-entropy alloy after severe plastic deformation. Acta Materialia 96 (2015): 258-268.
6. Lee, Erastus H. "Elastic-plastic deformation at finite strains." (1969): 1-6.
7. Navodariu, Nicolae, et al. Effect of local heating on the mechanical characteristics of repaired automotive panels. Materiale Plastice 56.4 (2019): 750-758.
8. Chen, Chao, et al. "Research on the mechanical properties of repaired clinched joints with different forces." Thin-Walled Structures 152 (2020): 106752.
9. Mori, Ken-ichiro, et al. "Joining by plastic deformation." CIRP Annals 62.2 (2013): 673-694.

Note /Precondiții / Obs:

Absolvenți ai programelor de studiu de Ingineria Autovehiculelor, Inginerie Mecanică, Inginerie Medicală, Mecatronică, Robotică, Inginerie Electrică; Cunoștințe de programare

TEMA 2: Îmbunătățirea metodelor de reconstrucție 3D**Conținut / Principalele aspecte abordate**

Creșterea calității informațiilor obiectelor 3D reconstruite digital prin implementarea componentelor de engineering, cu aplicații în ingineria auto / restaurare arheologică / culturală / medicină. Utilizarea tehnicilor CAE: transformarea volumelor / suprafețelor reconstruite 3D în modele virtuale ce pot fi analizate cu aplicații software dedicate.

Bibliografie recomandată:

1. Butnariu S., Analysis of mechanical structures using finite element method, lecture notes, ISBN 978-606-19-0311-5 (CD), Ed. Universitatii Transilvania din Brasov, 2013
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3. Butnariu, S., VR technologies for scanning, 3D reconstruction and tracking-lecture notes, CD, ISBN: 978-973-131-340-5, Ed. Lux Libris, 2016
4. Grigore C. Burdea, Philippe Coiffet, Virtual Reality Technology, 2nd Edition, ISBN: 978-0-471-36089-6, July 2003, Wiley-IEEE Press

Note /Precondiții / Obs:

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Conducător de doctorat,

Prof.dr.ing.Silviu BUTNARIU

Semnătură

Coordonatorul domeniului de doctorat,

Prof.dr.ing. Sorin VLASE

Semnătură



ADMISSION TO DOCTORAL STUDIES

Session September 2023

Field of doctoral studies: Mechanical Engineering

Doctoral supervisor: Silviu BUTNARIU

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Studies on the passive safety level of the post-accident vehicle*

Content / Main aspects to be considered

Strategies for scanning, segmentation and modeling of surface-type bodies (car body elements).

Analysis of plastic deformations under the action of dynamic stresses.

Analysis of repair methods of plastically deformed elements.

Analysis of body plasticity and coefficient of restitution.

Recommended bibliography:

1. Butnariu S., Analysis of mechanical structures using finite element method, lecture notes, ISBN 978-606-19-0311-5 (CD), Ed. Universitatii Transilvania din Brasov, 2013
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7. Navodariu, Nicolae, et al. Effect of local heating on the mechanical characteristics of repaired automotive panels. Materiale Plastice 56.4 (2019): 750-758.
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Prerequisites / Remarks:

Graduates of study programs in Automotive Engineering, Mechanical Engineering, Medical Engineering, Mechatronics, Robotics, Electrical Engineering; Programming knowledge

TOPIC 2: *Improving 3D reconstruction methods*

Content / Main aspects to be considered

Increasing the quality of information of 3D digital objects rebuilt by implementing engineering components, with applications in automotive /archaeological / cultural / medical restoration. Using the CAE technics: transforming the rebuilt 3D volumes / surfaces into virtual models that can be analyzed with dedicated software applications.

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Prerequisites / Remarks:

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Doctoral supervisor,

Prof.Dr.Eng. Silviu BUTNARIU

Signature



Coordinator of the field of doctoral studies,

Prof. Dr. Eng. Sorin VLASE

Signature

