Universitatea Transilvania din Brașov

ADMITERE DOCTORAT 2021-2022

Sesiunea Septembrie 2021

Școala Doctorală Interdisciplinară (SDI)

Domeniul de doctorat:
Inginerie forestieră
Conducător doctorat:
Prof.dr.ing.Lidia Gurău

TEME (TEMATICĂ) PENTRU CONCURS

TEMA 1: *Contribuții privind interacțiunea laserului cu lemnul și materiale pe bază de lemn și obținerea unor structuri flexibile cu aplicații multiple*

Conținut / Principalele aspecte abordate

1.Interacțiunea laserului cu lemnul și materialele pe bază de lemn. Cercetări privind factorii de influență în cazul gravării și tăierii cu laser

2. Flexibilizarea lemnului și materialelor pe bază de lemn, prin tăiere cu laser. Factori de influență. Cercetări privind flexibilizarea lemnului (și a unor materiale pe bază de lemn) prin tăiere cu laser și propunerea unor modele de tăiere optimizate, cu aplicații multiple

Bibliografie recomandată:

1. Barcikowski, S., Koch, G., and Odermatt, J. (2006). Characterisation and modification of the heat affected zone during laser material processing of wood and wood composites, Holz als Roh- und Werkstoff 64(2), 94-103. DOI: 10.1007/s00107-005-0028-1
2. Gurau L, Petru A, Varodi A, Timar M.C. (2017). The influence of CO2 laser beam power output and scanning speed on surface roughness and colour changes of beech (*Fagus sylvatica*). BioResources 12(4): 7395-7412, ISSN: 1930-2126, DOI: 10.15376/biores.12.4.7395-7412
3. Gurau, L., Petru, A. (2018). The influence of CO2 laser beam power output and scanning speed on surface quality of Norway maple (*Acer platanoides*), BioResources. 13(4): 8168-8183, ISSN: 1930-2126, DOI:10.15376/biores.13.4.8168-8183
4. Kubovský I., Krišták L.,Suja J, Gajtanska M, Igaz R., Ružiak I., Réh R. (2020). Optimization of Parameters for the Cutting of Wood-Based Materials by a CO2 Laser. Applied Sciences. doi:10.3390/app10228113
5. Kúdela, J.; Andrejko, M.; Mišíková, O. (2021) Wood Surface Morphology Alteration Induced by Engraving with CO2 Laser under Different Raster Density Values. Acta Facultatis Xylologiae Zvolen, 63(1); pp. 35–47.

Note /Precondiții / Obs: *materialele vor fi asigurate de către doctorand*

TEMA 2: *Cercetări privind calitatea suprafețelor obținute prin frezare pe mașini-unelte cu comandă numerică (CNC) în vederea optimizării procesului*

Conținut / Principalele aspecte abordate

1.Cercetări privind factorii de influență asupra calității suprafețelor prelucrate prin frezare pe mașini-unelte cu comandă numerică

2. Cercetări privind optimizarea procesului de frezare pe mașini-unelte cu comandă numerică și a calității suprafeței produsului finisat

Bibliografie recomandată:

1. Goli, G.; Bléron, L.; Marchal, R.; Uzielli, L; Negri, M. (2002).Formation and quality of wood surfaces processed at various grain angles-Douglas Fir and Oak. Proceedings of the 4th IUFRO Symposium Wood Structure and Properties 02. September 1-3, Bystra, Slovakia, Ed.Kudela, J., Kurjatko, S., pp.91-98, ISBN 80-967088-9-9.
2. Goli, G.; Marchal, R.; Uzielli, L.(2004) Classification of wood surface defects according to their mechanical formation during machining Proceedings of the 2nd International Symposium on Wood Machining – Properties of Wood and Wood Composites Related to Machining, Vienna, Austria on 5-7, ISBN/ISSN: 978-3-9501315-2-9.
3. Gurău, L.(2007). Quantitative Evaluation of the Sanding Quality in Furniture Manufacturing. Ed. Univ. Transilvania, Brasov, pg. 266, ISBN 978-973-598-126-6.
4. Iskra, P., Hernandez, R. (2008). The influence of cutting parameters on the surface quality of routed paper birch and surface roughness prediction modelling. Wood and Fiber Science, 41(1), 2009, pp. 28–37
5. Möhring,H.C., Eschelbacher, S., Güzel, K., Kimmelmann, M., Schneider, M., Zizelmann, C. Häusler, A., Menze, C. (2019). En route to intelligent wood machining – current situation and future perspectives. Journal of Machine Engineering, Vol. 19, No. 4, pp.5–26
6. Pinkowski, G., Szymański, W., Nosowski, T. (2012). Analyses of surface roughness in selected wood species after machining on a CNC woodworking centre. Annals of Warsaw University of Life Sciences - SGGW Forestry and Wood Technology. 79. 164-169.

Note /Precondiții / Obs: *materialele vor fi asigurate de către doctorand*

Conducător doctorat:

Prof.dr.ing.Lidia Gurău 

Transilvania University of Brasov

ADMISSION TO DOCTORAL STUDIES
2021-2022
Session September 2021

Interdisciplinary Doctoral School (SDI)

Field of doctoral studies:
Forestry engineering
PhD supervisor:
Prof.dr.eng. Lidia Gurău

TOPICS FOR THE ADMISSION TO DOCTORAL STUDIES

TOPIC 1: *Contributions on the interaction of laser with wood and wood-based materials and obtaining flexible structures with multiple applications*

Content / Main aspects to be considered

1. The interaction of the laser with wood and wood-based materials. Research on influencing factors in the case of laser engraving and cutting
2. Flexibility of wood and wood-based materials by laser cutting. Influencing factors. Research on the flexibility of wood (and wood-based materials) by laser cutting and the proposal of optimized cutting models with multiple applications

Recommended bibliografy:

1. Barcikowski, S., Koch, G., and Odermatt, J. (2006). Characterisation and modification of the heat affected zone during laser material processing of wood and wood composites, Holz als Roh- und Werkstoff 64(2), 94-103. DOI: 10.1007/s00107-005-0028-1
2. Gurau L, Petru A, Varodi A, Timar M.C. (2017). The influence of CO2 laser beam power output and scanning speed on surface roughness and colour changes of beech (*Fagus sylvatica*). BioResources 12(4): 7395-7412, ISSN: 1930-2126, DOI: 10.15376/biores.12.4.7395-7412
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5. Kúdela, J.; Andrejko, M.; Mišíková, O. (2021) Wood Surface Morphology Alteration Induced by Engraving with CO2 Laser under Different Raster Density Values. Acta Facultatis Xylologiae Zvolen, 63(1); pp. 35–47.

Prerequisites / Remarks: *the materials will be provided by the doctoral student*

TOPIC 2: *Research on the quality of surfaces obtained by milling on machine tools with numerical control (CNC) in order to optimize the process*

Content / Main aspects to be considered

1.Research on factors influencing the quality of surfaces machined on CNC tools

2. Research on the optimization of the milling process on numerically controlled machine tools and the surface quality of the finished product

Recommended bibliografy:

1. Goli, G.; Bléron, L.; Marchal, R.; Uzielli, L; Negri, M. (2002).Formation and quality of wood surfaces processed at various grain angles-Douglas Fir and Oak. Proceedings of the 4th IUFRO Symposium Wood Structure and Properties 02. September 1-3, Bystra, Slovakia, Ed.Kudela, J., Kurjatko, S., pp.91-98, ISBN 80-967088-9-9.
2. Goli, G.; Marchal, R.; Uzielli, L.(2004) Classification of wood surface defects according to their mechanical formation during machining Proceedings of the 2nd International Symposium on Wood Machining – Properties of Wood and Wood Composites Related to Machining, Vienna, Austria on 5-7, ISBN/ISSN: 978-3-9501315-2-9.
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5. Möhring,H.C., Eschelbacher, S., Güzel, K., Kimmelmann, M., Schneider, M., Zizelmann, C. Häusler, A., Menze, C. (2019). En route to intelligent wood machining – current situation and future perspectives. Journal of Machine Engineering, Vol. 19, No. 4, pp.5–26
   Pinkowski, G., Szymański, W., Nosowski, T. (2012). Analyses of surface roughness in selected wood species after machining on a CNC woodworking centre. Annals of Warsaw University of Life Sciences - SGGW Forestry and Wood Technology. 79. 164-169.

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PhD supervisor:

Prof.dr. Lidia Gurău