

Rado Gazo - Curriculum Vitae

Dr. Gazo is a professor of Forestry and Natural Resources in the Department of Forestry and Natural Resources at Purdue University. He authored or co-authored 63 successful proposals for grants and contracts, totaling \$6.5 million (attributable to him), with over \$5.5 million of that related to evaluating tree, log and lumber quality using CT, laser and image scanning research and development. He has published 40 refereed research journal articles, 5 teaching articles, 6 book chapters, 50 refereed proceeding articles and 175 other publications. He has given more than 115 invited and 210 other presentations.

Dr. Gazo's research focuses on the application of industrial engineering and operation research techniques to problems in primary and secondary wood products manufacturing industries. In this field, he was the first to develop a flow simulation program that models processing of wood in a furniture company. Companies using his program were able to increase significantly their raw material utilization and process effectiveness. His continuing efforts in this area have brought him international recognition that includes invited papers, a paid visiting research scientist position in New Zealand and a grant from Canadian government/industry research institution, among others.

Since 2004, working closely with Indiana primary and secondary industry, Indiana Hardwood Lumbermen's Association and others, Dr. Gazo helped to formulate a strategy for research on advanced wood products manufacturing. This strategy has now been adopted by the newly created Indiana State Department of Agriculture and was actively supported by Purdue University's Center for Advanced Manufacturing. In the framework of these efforts, Dr. Gazo refocused a major portion of his research activities on the development of CT scanning of logs and lumber, and establishment of a Hardwood Scanning Center. He organized a consortium of Indiana hardwood lumber and veneer manufacturers and other state and national institutions to fund this new area of research. In 2012, this effort has successfully brought *the industry first-ever commercially available industrial-grade CT scanner and related optimization software*, and in 2018, *the industry first-ever successful automated hardwood lumber grading system*.

Selected publications related to computed tomography evaluation of trees, logs and lumber:

Refereed

- Gazo, R, Wells, L., *Krs, V. and B. Benes. 2018. Validation of automated hardwood lumber grading system. *Computers and Electronics in Agriculture* (2018), <https://doi.org/10.1016/j.compag.2018.06.041>
- Wells, L., Gazo, R., Del Re, R., Krs, V. and B. Benes. 2018. Defect detection performance of automated hardwood lumber grading system. *Computers and Electronics in Agriculture* (2018), <https://doi.org/10.1016/j.compag.2018.09.025>
- Gazo, R. and J. Chang. 2012. Hardwood Log CT scanning. *Proceedings of the 2012 IUFRO D5 Conference Forest Products*. Lisbon, Portugal.

- Gazo, R. and J. Chang. 2010. Hardwood Log CT scanning – Proof of Concept. In *Proceedings of Joint UNECE Timber Committee Session and Society of Wood Science and Technology International Convention: Innovative Wood Products are the Future*. United Nations, Geneva, Switzerland. CD ROM, 5 pages.
- Chang, J. and R. Gazo. 2009. Measuring the effect of internal log defect scanning on the value of lumber produced. *Forest Products Journal*. 59(11/12):56-59.
- Chang, J. and R. Gazo. 2009. Hardwood Log CT scanning – Proof of Concept. In *Proceedings of ISCHP 09 – 2nd International Scientific Conference on Hardwood Processing*. FCBA Paris, France.

Other

- Wells, L. and R. Gazo. 2018. Defect Detection – Automated Hardwood Lumber Grading. Forest Products Society - 72nd International Convention. Madison, WI.
- Wells, L., Gazo, R., Krs, V. and B. Benes. 2017. Automated Hardwood Lumber Grading. 71st Forest Products Society Meeting, Starkville, MS.
- Gazo, R., F. Giudiceandrea, Wells, L., Krs, V., and B. Benes. 2018. Automated Hardwood Lumber Grading. Indiana Hardwood Lumbermen’s Annual Convention, Indianapolis, IN.
- Gazo, R., F. Giudiceandrea, Wells, L., Krs, V., and B. Benes. 2018. State-of-the-art Industrial Applications of CT Scanning Hardwood Trees, Logs and Scanning of Lumber. Environmental and Technological Challenges of the Next Generation. Bloomington, IN.
- Gazo, R., F. Giudiceandrea, Wells, L., Krs, V., and B. Benes. 2018. Big Data and Digital Manufacturing in Hardwood Industry. Virginia Tech. Blacksburg, VA.
- Gazo, R. 2018. Lumber quality throughout the hardwood supply chain. National Hardwood Lumber Association lumber grading workshop. Indianapolis, IN.
- Gazo, R., Giudiceandrea, F., Wells, L., Krs, V., and B. Benes. 2018. Automated Hardwood Lumber Grading. Indiana Hardwood Lumbermen’s Annual Convention, Indianapolis, IN.
- Gazo, R. and F. Giudiceandrea. 2017. Advancements in Automated Hardwood Lumber Grading. National Workshop: Demonstration of Automated Hardwood Lumber Grading System. Akron, IN.
- Gazo, R. 2017. Use of CT scanning in log processing. National Hardwood Lumber Association, Memphis, TN.
- Gazo, R., Wells, L., Krs, V. and B. Benes. 2017. In-depth Performance Analysis of Human vs. Automated Hardwood Lumber Grading Systems. Akron, IN.
- Gazo, R. 2017. Computer-assisted hardwood lumber grading. National Hardwood Lumber Association, Memphis, TN.
- Gazo, R. 2012. Benefits of Hardwood Log CT scanning. 2nd International Conference on Processing Technologies for the Forest and Bio-based Products Industries. St. Simons Island, GA.
- Gazo, R. 2012. Use of CT scanning in log processing. Timber Processing & Energy Expo. Portland, OR.
- Gazo, R. and B. Benes. 2012. Hardwood Scanning Center. Nuove Energie – Innovation Festival. Bolzano, Italy.