IUFRO Division 5.04.13
Industrial Engineering, Operations Analysis and Logistics
 proudly presents

IUFRO DIVISION 5.04.13 PRESENTATION
&
SPECIAL PRESENTATION ON THE ADOPTION OF INDUSTRY 4.0 IN THE WOOD PRODUCTS MANUFACTURING INDUSTRY

Moderated by

Professor Dr Scott Leavengood
Deputy Coordinator, IUFRO Div. 5.04.13
Department of Wood Science and Engineering, Oregon State University, USA

Ts. Dr Judith Gisip
Coordinator, IUFRO Div. 5.04.13
Faculty of Applied Sciences, Universiti Teknologi MARA, Malaysia

PARALLEL SESSION 1
28 SEPTEMBER 2021, 22:30–23:30 PM UTC
Time Zone North and South America

OPPORTUNITIES OF HARDWOOD LUMBER IN MASS TIMBER

Professor Dr Henry J. Quesada
Deputy Coordinator, IUFRO Div. 5.04.13
Department of Sustainable Biomaterials, Virginia Polytechnic Institute & State University, USA

INDUSTRY 4.0 AND SECONDARY WOODWORKING FIRMS: PERCEPTIONS AND EXPERIENCES IN NORTH AMERICA

Professor Dr Urs Buehlmann
Department of Sustainable Biomaterials, Virginia Polytechnic Institute & State University, USA

PARALLEL SESSION 2
29 SEPTEMBER 2021, 03:45–04:45 AM UTC
Time Zone Asia, Asia-Pacific, Oceania

THE STATUS OF TECHNOLOGY APPLICATION IN THE MALAYSIAN FURNITURE INDUSTRY AND ITS READINESS TO INDUSTRY 4.0

Professor Dr Manfred Gronalt
Deputy Coordinator, IUFRO Div. 5.04.13
Institute of Production Economics and Logistics, University of Natural Resources and Life Sciences Vienna, Austria

Requirements and Challenges on Developing Digital Twins in Industrialised Housebuilding Industry

Professor Dr Jegatheswaran Ratnasingham
Faculty of Forestry & Environment, Universiti Putra Malaysia, Malaysia

Registration link at https://www.iufroworldday.org/signup
e-Certificate will be provided and no registration fee
Search “Shah Alam, Malaysia” on the IUFRO World Day Interactive Map for links to the sessions

Organized by
IUFRO Division 5.04.13
Industrial engineering, operations analysis and logistics

INTERNATIONAL UNION OF FOREST RESEARCH ORGANIZATIONS (IUFRO)
PARALLEL SESSION 1
28 SEPTEMBER 2021, 22:30-23:30 PM UTC

22:30-22:40 pm UTC Scene setting by Prof. Dr Scott Leavengood
Deputy Coordinator, IUFRO Div. 5.04.13, Director, Oregon Wood Innovation Center, Oregon State University, USA

22:40-22:45 pm UTC Welcoming Remarks by Ts. Dr Judith Gisip
Coordinator, IUFRO Div. 5.04.13, Senior Lecturer, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia

22:50-23:05 pm UTC Opportunities of Hardwood Lumber in Mass Timber
Professor Dr Henry J. Quesada
Deputy Coordinator, IUFRO Div. 5.04.13
Professor, Department of Sustainable Biomaterials
Virginia Polytechnic Institute & State University, USA

23:05-23:20 pm UTC Industry 4.0 and Secondary Woodworking Firms: Perceptions and Experiences in North America
Professor Dr Urs Buehmann
Professor, Department of Sustainable Biomaterials
Virginia Polytechnic Institute & State University, USA

23:20-23:30 pm UTC Question & Answer Session

PARALLEL SESSION 2
29 SEPTEMBER 2021, 03:45-04:45 AM UTC

03:45-03:55 am UTC Scene setting by Prof. Dr Scott Leavengood
Deputy Coordinator, IUFRO Div. 5.04.13, Director, Oregon Wood Innovation Center, Oregon State University, USA

03:55-04:00 am UTC Welcoming Remarks by Ts. Dr Judith Gisip
Coordinator, IUFRO Div. 5.04.13, Senior Lecturer, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia

04:00-04:05 am UTC Photography Session

04:05-04:20 pm UTC Requirements and Challenges on Developing Digital Twins in Industrialised Housebuilding Industry
Professor Dr Manfred Gronalt
Deputy Coordinator, IUFRO Div. 5.04.13
Professor, Institute of Production Economics and Logistics
University of Natural Resources and Life Sciences Vienna, Austria

04:20-04:35 pm UTC The Status of Technology Application in the Malaysian Furniture Industry and Its Readiness to Industry 4.0
Professor Dr Jegatheswaran Ratnasingam
Professor, Faculty of Forestry & Environment
Universiti Putra Malaysia, Malaysia

04:35-04:45 am UTC Question & Answer Session

Biography

Judith Gisip joined Universiti Teknologi MARA (UiTM) in 2005 and is currently a senior lecturer of Eco-Technology Program at the Faculty of Applied Sciences, UiTM Shah Alam, Selangor. She worked as a research assistant under the Wood Machining and Tooling Program at North Carolina State University, USA and conducted tool wear research at the Department of Forestry and Natural Resources, Purdue University, USA. Her current research interests are in the areas of automation in wood-based industry and additive manufacturing. She teaches CAD/CAM/CAE technology for eco-products manufacturing and technology entrepreneurship at UiTM. Judith holds a Diploma in Wood Industry from UiTM Jengka Campus, Pahang, B.S. in Furniture Technology from UiTM Shah Alam, M.S. from Purdue University, and a Ph.D. in Forest Biomaterials from North Carolina State University.

Scott Leavengood is Director of the Oregon Wood Innovation Center at Oregon State University (OSU), USA. The center is a joint initiative of OSU’s College of Forestry and the OSU Extension Service. Scott has been with OSU since 1994. His primary job duties are related to industrial outreach which includes providing technical assistance to wood products firms and assisting entrepreneurs. He also teaches a course on advanced manufacturing. Scott has a B.S. in Wood Science from Colorado State University, M.S. from OSU, and a Ph.D. in Engineering Management from Portland State University.
PARALLEL SESSION 1
28 SEPTEMBER 2021, 22:30-23:30 PM UTC

Opportunities of Hardwood Lumber in Mass Timber
Henry J. Quesada, Department of Sustainable Biomaterials, Virginia Polytechnic Institute & State University, USA

This presentation will go over the main issues preventing hardwood lumber in the US and Canada access to the mass timber market. In addition, updates on the work conducted at Virginia Tech to overcome these issues will be presented.

Industry 4.0 and Secondary Woodworking Firms: Perceptions and Experiences in North America
Urs Buehlmann, Department of Sustainable Biomaterials, Virginia Tech, Blacksburg, VA, USA

Matthew Bumgardner, Northern Research Station, USDA Forest Service, Delaware, OH, USA

Industry 4.0 could help improve the competitiveness of the North American woodworking industry. Adoption of the principles of Industry 4.0 may challenge the woodworking industry, however, due in part to the relatively small size and scale of many firms in the industry. A study was conducted in late 2019 to assess the perceptions and experiences of secondary wood manufacturers concerning Industry 4.0, or more broadly the digitalization/computerization of their manufacturing operations. Digitalization is increasing in both large and small wood products operations, but many companies lack a long-term plan or vision on how to integrate Industry 4.0 technology into their businesses. The study was a joint effort by Virginia Tech, the USDA Forest Service, and Woodworking Network/FDMC.

PARALLEL SESSION 2
29 SEPTEMBER 2021, 03:45-04:45 AM UTC

Requirements and Challenges on Developing Digital Twins in Industrialised Housebuilding Industry
Manfred Gronalt, Institute of Production Economics and Logistics, University of Natural Resources and Life Sciences Vienna, Austria

The industrialised housebuilding industry is a steady growing business in the forest-based sector. In order to cope with increasing customer expectations, production must be continuously improved. This applies not only to new materials and components used and new pre-processing, joining and assembly methods applied but also the development of digital tools for production planning and control. Digital twins work with a replica of the real manufacturing. They can analyze a resource bottleneck before they actually occur and reschedule the plan. This presentation will show our works and pathway on developing such a twin. We focus on the following pillars: 1) integrated data warehouse, 2) simulation-based optimization of production lines and 3) real time data-based rescheduling. The results show how digital twins are supporting production and capacity planning in this industry.

The Status of Technology Application in the Malaysian Furniture Industry and Its Readiness to Industry 4.0
Jegatheswaran Ratnasingam, Faculty of Forestry & Environment, Universiti Putra Malaysia, Malaysia

This paper will provide an overview of the current level of automation in the Malaysian furniture industry and assess the readiness of the industry towards the concept of Industry 4.0. It will also reveal the relationship between size of companies and their readiness to invest in technology, and the main technologies that is presently adopted. The presentation will also highlight the development of an M.Sc. program on Industry 4.0 for the wood and furniture industry in Malaysia, through the EU funded Erasmus+ program. The result from the Malaysian survey will also be compared against the results from the regional survey in terms of Industry 4.0 adoption.

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