

Intelligent decision systems in the wood-products industry

Proposal of Open invited track for the 20th IFAC World Congress

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Abstract:

The wood-products industry is subject to major uncertainties coming from dynamic product innovation, volatile markets, and wood material quality variations. These characteristics lead to specific decision processes which have to take into account not only demand but also quality, material, and temporal variabilities. Moreover, the inherent divergent production processes also induce specificities in decision processes. This open invited track is aimed at decision, innovation, and quality control processes relative to the first and the second wood transformation processes, from wood supply to final products distribution.

IFAC technical committee(s): TC 5.1

Detailed description:

The world forests supply a highly diversified industry (pulp, lumber, building, furnitures, ...) and is subject to uncertainties coming from dynamic product innovation, market transformations (emergence of wood-energy and biorefineries), and resource availability due to climatic and sanitary crises. As a result, supply chain management, production planning and process control reach a high level of complexity. This requires models, methodologies, decision supports tools which support the development of suitable solutions that enhance the performances of the wood sector.

Problems of interest associated to this context include, models and architecture design of decision systems which have to be implemented in ERP or APS. Optimization, simulation and a combination of both are frequently used to evaluate decision or decision processes. Traceability processes and technologies, European Community standards need also to be defined to achieve worldwide sustainable objectives. Such systems could be centralized or distributed. They are used to define optimal, or near optimal, solutions taking into account the numerous constraints (inventories, costs, human resources, lead times ...)

In this context, the track will cover all topics related to design, control and performance evaluation of wood-products industry decision-making systems, including (but not limited to) the following:

- Supply Chain design
- Supply Chain management
- Control of production systems
- Models for supply and distribution
- Architecture design of Supply chain or manufacturing control systems
- Traceability in wood industry
- Performance indicators and enhancement
- Intelligent systems in wood industry
- Case studies on intelligent systems in wood manufacturing or supply chain
- Classification and quality management (biometric approaches)
- Communication Pattern and interoperability considering new and/or legacy systems

TC for evaluation : TC 5.1

Internet links to additional material:

IUFRO = <http://www.iufro.org/>

Forest products society = <http://www.forestprod.org/>

References:

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Feng, Y., D'Amours, S., LeBel, L., & Nourelfath, M. (2012). Integrated forest biorefinery supply chain network design using mathematical programming approach. *Integrated Biorefineries: Design, Analysis, and Optimization*, 251.

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Jover, Jeremy; Thomas, André; Leban, Jean-Michel; Canet, Daniel, "Pertinence of new communicating material paradigm: A first step towards wood mass marking", *Journal of Physics: Conference Series*, 416, 1, (2013) hal-00544003.

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