Modeling and simulation of the EM630 Geared motor with encoder resorting to SimTwo: The official Robot@Factory Simulator

José Gonçalves, José Lima, Paulo J. Costa, A. Paulo Moreira

This paper describes the EM630 mechanical and electrical modeling and its simulation resorting to SimTwo (RobotFactory mobile robot competition official simulator). It is described the developed setup applied to obtain the experimental data that was used to estimate the actuator parameters. It was obtained an electro mechanical dynamical model that describes the motor, its gear box and the encoder. The motivation to model and simulate the EM630 is the fact that it is an actuator worldwide popular in the mobile robotics domain, being a low cost 12v motor equipped with encoders and a 30:1 reduction gearbox. The goal of this work is to provide more realism and new features to the RobotFactory official simulator, allowing participating teams to produce and validate different robot prototypes and its software, reducing considerably the development time.

Concept of the System for Optimization of Manufacturing Processes

Silvia Palajová, Milan Gregor

This paper deals with the optimization of manufacturing and logistics processes with the support of progressive computer simulation approaches. It briefly discusses systems and tools developed at the University of Zilina, from the Laboratory of Intelligent Systems ZIMS, through the use of simulation and software as a service, to own computer applications based on Genetic Algorithms (GA and GAs), scheduling of custom production (SSM) and metamodeling (SAGE). The alignment of developed tools is represented in the system OSMAP.

FMEA as Applied to Electronic Manufacturing: A Revised Approach to Develop a more Robust and Optimised Solution

J Enright, H Lewis, A Ryan

A manufacturing company in the electronics manufacturing industry has made the decision to re-engineer its electronics manufacturing processes using FMEA. The company is currently using a basic FMEA process to assess the risk of its processes, and the resulting FMEA is used to make decisions about process improvements. The process of re-engineering the electronics manufacturing processes using FMEA is a complex and time-consuming task. The process of re-engineering the electronics manufacturing processes using FMEA is a complex and time-consuming task. The process of re-engineering the electronics manufacturing processes using FMEA is a complex and time-consuming task.

Solid Wood Panel Manufacturing Using Low Quality Materials

Omar Espinoza, Urs Buehlin, Maurice Deaver

Low-value hardwoods are not used to its full potential because they possess a challenging economic proposition to entrepreneurs in search of profit. In particular, high extraction and processing costs for low-value and underutilized hardwoods are not offset by products that carry a high enough value to customers to ensure feasible economics. Thus, the low-value biomass is not used sufficiently in LSU forests to support sustainable quality forest management practices. Furthermore, economic opportunities are lost for rural economies and forest landowners. The main purpose of the project described is to design the manufacture of a high value product from low-value hardwood timber achieving positive economics, thereby maintaining the efficient and effective use of the resource. In particular, the project assesses the markets and the technical potential for manufacturing solid, finger-jointed edge-glued hardwood panels from low-value hardwoods. In fact, the technical feasibility of manufacturing edge-glued panels has been proven and is a major product of wood components manufacturers in the U.S. However, the use of low-value hardwoods for this purpose has not received much attention. This study intends to fill this gap by conducting an exhaustive analysis of secondary sources to assess raw material availability for such panels from low-value hardwoods. Also, appropriate processing routes to achieve competitive target prices while assuring positive economics are investigated.

* Corresponding author: jose.a.goncalves@inescporto.pt
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* Corresponding author: silvia.palajova@fazio.janita.sk
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