

# Lissandra Comas

---

Major: Industrial Engineering

University: Polytechnic University of Puerto Rico

Faculty Mentor: Dr. Luis Occeña

Mentor Department: Industrial and Manufacturing Systems Engineering

Funded by: Louis Stokes Missouri Alliance for Minority Participation

## **Single component vs. whole furniture packing in virtual reverse manufacturing**

Lissandra Comas Flores, Luis G. Occeña, Eknarin Santitrakul and Li-Hsiu Wang

Previous research studies have analyzed the issues associated with the computer integration of the various technologies now available for hardwood log sawmills. These new technologies were created to optimize the quantity and quality of wood extracted from the logs. The technology that I am working in my research consisted of a computerized tomography (CT) scans that were converted to solid model images of the internal structure of the log. The availability of such images offer the potential for more precise sawing decisions. The potential for improvement of log utilization and whole furniture yield are the two factors considered in this research. We conducted a nondestructive process simulation experiment using a specially-developed software that enables us to evaluate the process variation in the way wood is extracted for the production of furniture. Instead of packing all the components needed for a specific furniture as done in a previous study, only one component was packed in each log. So far we have found that when we mix the three logs from each grade, with only one log supplying each component, the number of whole tables completed was less than when we packed all components together. However when we combined all the nine logs without considering the grades, we found one combination that resulted in more tables. Log utilization, however, was improved in 55% of the logs when only one component was packed instead of the whole furniture.