



WBC NEW PROJECT PROPOSAL

Project Title:	Optimization of log conditioning and peeling process and real-time monitoring of veneer surface roughness		
Expected Duration:	24 months	Start Date:	September 2024
Investigator(s):	S. Leavengood, V. Nasir, M. Riggio, L. Schimleck		Submitted by: S. Leavengood
Related to Topic/Theme:	A3b, D4, D5		

GOALS & OBJECTIVES:

Development of an intelligent monitoring model for real-time estimation of veneer surface roughness using lathe vibration data and using veneer roughness information to predict bonding performance of veneer-based products.

Specific objectives for the 1st year of the project are to:

- 1) Collect log quality and conditioning data.
- 2) Acquire lathe vibration signals during the peeling process.
- 3) Conduct data analytics and process lathe vibration signals.
- 4) Veneer roughness measurement (direct method).

EXPERIMENTAL PLAN:

Phase 1

1. Investigators recruit M.S. student, work with WBC members to solicit industry partner for project
2. Data collected by the student at the partner mill on parameters related to: logs, conditioning, and lathe.
3. Vibration sensor installed on lathe and tested; data collected in the mill and signal segmented, de-noised, and features extracted/selected
4. Veneer samples collected from partner mill, taken to OSU, roughness measured on 12"x12" specimens
5. Data analytics conducted to evaluate impact of log parameters on vibration signal; extracted features used to predict overall roughness; roughness grade categories established.

Phase 2

6. Conduct AI and Machine Learning modeling on data; test panels fabricated, roughness data used for predicting bonding performance

OUTCOMES & DELIVERABLES:

TASK	DELIVERABLE	MONTH/YEAR	RESPONSIBILITY
Log quality and conditioning data acquisition	Input dataset	Sep-Nov 2024	Student
Vibration signal data acquisition	Sensory dataset	Nov 2024-Feb 2025	Student and PIs
Veneer roughness measurement (direct method)	Roughness model (model output dataset)	Jan 2025-Apr 2025	Student
Data analytics	Pre-processed signals	Jun-Jul 2025	Student
Dissemination of Phase 1 results	Phase 1 progress report	Aug 2025	Student and PIs
Initiate Phase 2	Phase 2 test plan	Aug 2025	Student and PIs

EXPECTED PRACTICAL IMPLICATIONS / IMPACTS:

1. Provide a system for real time assessment of veneer lathes
 - a) focused early in the manufacturing process – when opportunities still exist to make adjustments
 - b) will include parameters related to log inventory
 - c) improved knowledge (real-time) of knife condition
2. Data analytics will link wide variety of material and process parameters
3. Use of low-cost and robust sensors will help to speed industry adoption
4. Model developed will provide a solution to a current gap in the industry: assessment of veneer quality (specifically, roughness) on a larger scale
5. Skills gained will be very valuable for student

BUDGET JUSTIFICATION:

GRA funds for 0.49 FTE M.S. student w/base monthly salary of \$4,874 for a total of \$28,659 for year 1. Student will be responsible for data collection and analysis; Fringe benefits for student follow institutional approved guidelines and start at 34% for \$9,774 for year 1; Tuition and fees budgeted for 3 terms total \$5,187.

Materials and supplies include costs for sensors.

Travel funds are for student to travel to the partner mill and to WBC meetings

BUDGET (including expected duration):

Year 1 Budget Estimate:

Student GRA and benefits: \$38,403

Tuition and Fees: \$15,661

Travel and Other: \$3,186

Materials/Supplies: \$2,500

Total Yr. 1: \$59,650