Veneer Sheet Identification

Team Asia

Sponsored By: Metriguard
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Date Submitted: February 2nd, 2019

Section 1. Project Title and Overview

The Veneer Sheet identification project, sponsored by Metriguard, is a project to correctly identify sheets of veneer based on its features. From the data collected from Metriguard's machine, we will use the data to train a model to recognize the sheets. The same sheets will be run through in a randomized order to verify the accuracy of the trained model.

Later on, we will expand the project to reduce the dataset by selecting certain features that are more significant that the other while maintaining the accuracy of our model. By reducing the size of our dataset, we can optimize the size of the final program while also keep the user running time as fast as possible.

Section 2. Project Description

Section 2a. Purpose and Need:

The purpose of our project/software is to effectively (and continuously) identify sheets of veneer in order to improve the production of Metriguard machinery and ultimately add more functionality to their veneer sheet products. Fortunately, Metriguard's established software already grades veneer sheets on a scale (given to the program) in order to determine the good from bad but we believe this process can be sped up. As of now the machines that the Metriguard manufactures are key components to the lumber industry more specifically veneer for plywood and LVL and we believe with our help they can give their customers and even better product than they offer now.

Section 2b. Business Significance:

Metriguard has been a well-known and recognized company around the globe for over 30 years. They have a solid reputation and their veneer machines are “” in the production process of plywood and LVL. The new changes that would be added to their already existing software will in the end increase value of their veneer machinery/products and will over time result in an increase in customer base.

Section 2c. Benefit:

With successful execution and implementation of this feature, Metriguard would be able to attract more customers, reach a broader market, and increase their revenue by an increase of sales price. We also believe that once we are able to identify sheets of veneer, we can also expand the use case to detect other types of material, adding more potential business opportunity for Metriguard.

Section 3. Features (Functionality & Limitations)

Functionality:
The program will be able to recognize veneer sheets by comparing data from two types of sensors with historical readings stored in a database. It will also be able to compress the sensor data for a single veneer sheet from multiple megabytes to a few kilobytes. (See Appendix).

Limitation:
We will try to achieve a high recognition accuracy, but an 100% accuracy is likely impossible. We will also rely on the loader to load the veneer sheet correctly into the machine and the accuracy of the sensor to be able to get the data the program needs to make an informed decision. Additionally, the accuracy of the program will rely on the condition the sheet is kept in. For example, if there is a significant change of moisture content of a veneer sheet in between data collections, the software will be less likely to be able to recognize the sheet.

Section 4. Review of Literature / Packages for Implementation

- Python (Implementation)
- Heroku (Web Deployment)
- HTML/CSS/JS (Web User Interface)
- PostgreSQL (Database Management)
- Visual Studio Code (Coding Environment)
- GitHub (File Management)
- Slack (Communication)

Section 5. Stakeholders

The stakeholders of this project include:

- Sponsor:
    - Metriguard
      Phone: (509)-332-7526

- Mentors:
    - Tim Meekhof (Metriguard)
      Email: tmeekhof@metriguard.com

    - Dean Nelson (Metriguard)
      Email: dnelson@metriguard.com

    - Behrooz Shirazi (Washington State University)
      Email: Shirazi@wsu.edu
      Phone: (509)335-8520

- Developers:
    - Cole Furukawa (Washington State University)
    - Yuka Langbuana (Washington State University)
    - Bumjin Park (Washington State University)
    - Maohan Sun (Washington State University)

- Potential Users:
    - Users of wood veneer testing equipments by Metriguard
    - Users of products manufactured/tested by Metriguard equipments

Appendix

Flow Chart: