

24783 Project Proposal

Team: 2D-CAD

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Current research on automated welding uses CAD models and uses the 2-D aspects of the models to perform motion planning and collision detection in MATLAB. This is currently done manually by a student by defining the outer shape of a CAD model within MATLAB each time a new object or material is added for analysis. Unfortunately, CAD-software only export data in STL file format which is not very useful other than visualizing the model.

We want to make a program that parses through the STL file (ascii or binary), and identifies the outer shape of a model. For example, the program will be able to extract x and y vertices and save them as top-view.

Our goal is to develop the program with following features:

- Parse through STL files and extract features.
- Visualize in 2-D plane
- Save the data so that it can be ported to other softwares
- Display 6 primary views in C++ OpenGL (Fig 1.)
- Loop selection to break up the parts (Fig 2.)
- Have a selector cube to let the user choose the views and convert selected projections to 2-D coordinates in a .txt file

The initial goal is to make the program robust enough to be able to handle rectangular objects or edged / chamfered objects with no corners. If we are successful in this objective and have enough time to develop, we will attempt to tackle round objects or filleted objects.

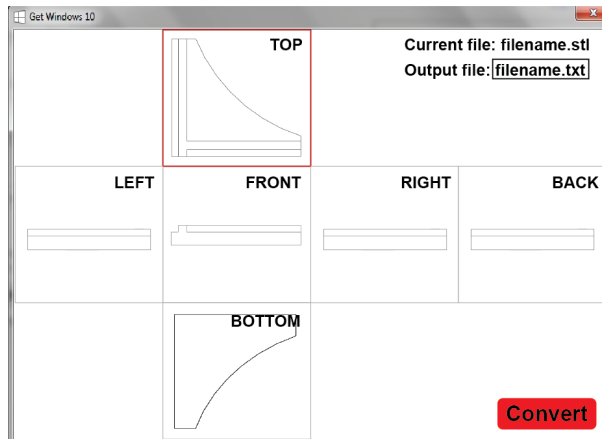


Fig 1. Primary View Window

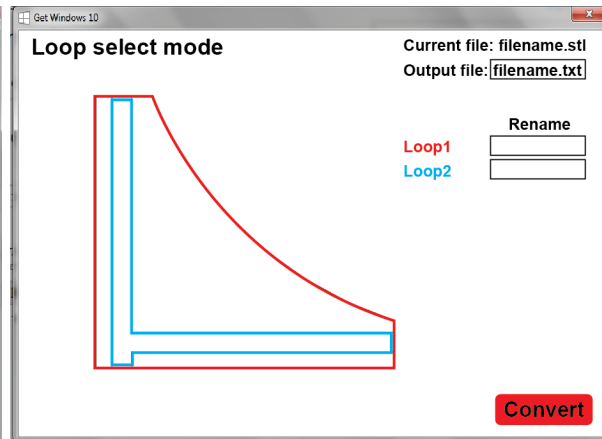


Fig 2. Loop Selection