Non-planar Slicing for Extrusion-based 3D Printing

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With increasingly-complex concepts being developed in areas such as aerospace engineering, 3D printing is relied upon for prototyping and part manufacturing. However, due to the additive method of manufacturing that extrusion-based 3D printers utilize, produced parts often lack the structural integrity and surface finish to function as desired. This is primarily due to the use of flat, planar layers, which are prone to shearing, in the process of translating a 3D model into G-code (instructions) for the 3D printer. Due to this, a program that utilizes non-planar layers to construct G-code files for extrusion-based 3D printers would improve the shear strength of produced parts. A program, named JSlicer, was created using the Java programming language that employs non-planar layers for extrusion-based 3D printing. JSlicer accepts 3D models as inputs and outputs usable G-code files. In addition, JSlicer operates under adequate times, comparable to modern-day leading slicing programs.

Awards Won:

Third Award of $1,000