Overview
UnisBrands, LLC is a start-up company that produces customizable 3D printed footwear. The product exterior contained printing flaws and step lines that negatively affected the aesthetic of the footwear. UnisBrands previous procedure for lining the interior with fabric was time consuming and inefficieny. UnisBrands required procedural modifications to finish the exterior and interior of the 3D printed footwear prior to product release in Summer 2018.

Objectives
The goal of this project is to help UnisBrands, LLC develop a consistent and efficient procedure for finishing 3-D printed footwear. The printing lines of the exterior of the footwear must be smoothed to improve aesthetic appeal and the interior of the footwear requires a fabric lining to increase customer comfort.

Approach
• The team discussed the goals and future of UnisBrands with the sponsor, Nicholas Unis, to understand the needs for the footwear finishing procedure.
• The team researched common methods for the smoothing of 3D printed parts.
• Work was completed at the UnisBrands office at State College HappyValley Launchbox.
• Multiple methods of exterior finishing were tested on 3” printed squares of the footwear material.
• Two sewing machines were tested to attempt lining the interior of the footwear with fabric.
• CAD models of the footwear were modified to include threading holes to attempt hand-sewing of the fabric lining.
• A CAD model was created for a sanding guard to maintain consistency in the width of the footwear’s rubber sole.
• The sanding guard was printed and tested. The guard costs approximately $2.97 to produce.

Outcomes
• Steam treatment with water effectively reduces the appearance of printing lines on the exterior of the footwear.
• The addition of threading holes in the CAD model of the footwear reduces the cost and labor necessary for lining the footwear with fabric.
• The sanding guard (< $3) increases the consistency of the width of the rubber sole and decreases production time.
• The team printed a CAD model of a part for UnisBrands patent-pending 3D printer. This part, which cost $100 to purchase, can be 3D printed for less than 25 cents.
• The production process, including the new finishing procedures, will take less than 24 hours total. UnisBrands goal for time from order to shipping is 24-72 hours.