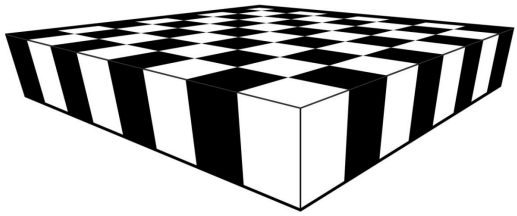
Professor: Jennifer Stamm, PhD
Spring 2020

MAE 364 Manufacturing Processes

Comparative Analysis Project
Gate 3 - Project Planning

Group Members:
Damian Host - 50171722
Vladimir Shapiro - 50181136
Ashraf Hossain - 50138850
James Roetzer - 50184851
Wenzhi Lyu - 50159420
Ayesha Khatun - 50243514



EVALUATING THE DESIGNS

After brainstorming six different designs for our chess pieces, we have to narrow it down to one piece. Since we are group four we are going to be looking at our queens that we came up with. In order to make this decision we have decided to make a decision matrix to look at all six of the designs. You can see this below.

Table 1: Decision Matrix

	Appearance	Complexity	3D Printability	Theme
Damian				
Vladimir				
Ashraf				
James				
Wenzhi				
Ayesha				

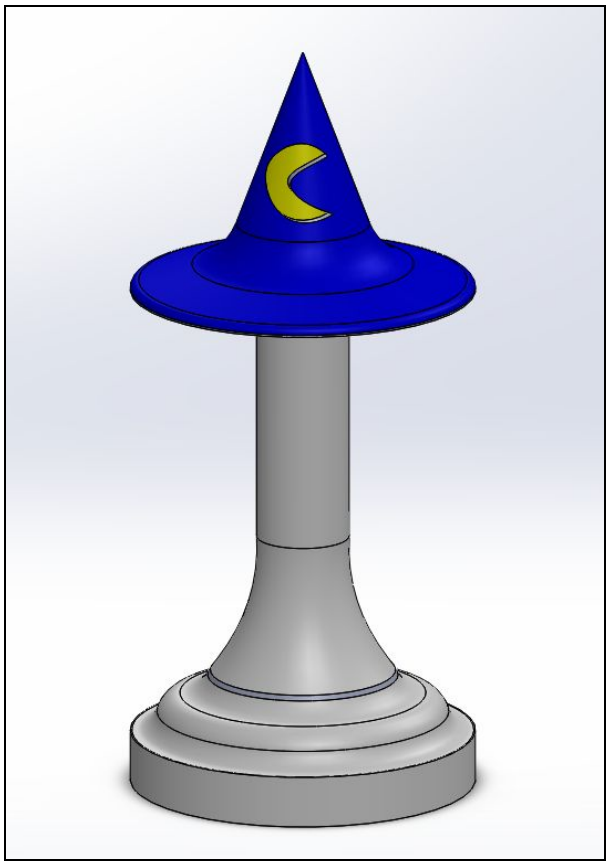
We decided to use appearance, complexity, 3D printability and theme as parameters to rate the different designs on. Appearance is the overall look of the piece and if it looks aesthetically pleasing to people at a glance. It is important for our pieces to look nice so that people enjoy playing with our chess set. Complexity has to do with how complicated the design is. We want a low complexity design so that people do not have to think about what it might be. The next category is 3D printability and this deals with how hard it would be to model and then print the design. By having a design that is hard to print and would require a lot of work after it was finished in order to produce a final product. The last category is theme and this is simply how well the design fits within our theme. We want to make sure that hats are the main focus of the design, therefore designs with other features that detract from the hat it is ranked lower. By using these four parameters we were able to narrow down our six designs to just one.

As you can see in table one above, we used a color ranking system in our decision matrix. Green means that the design fits very well in a certain category and it cannot be better. Yellow signals that the design is just average and can be worked upon, but is not that bad. Red tells us that the design is very bad for a certain category and would need

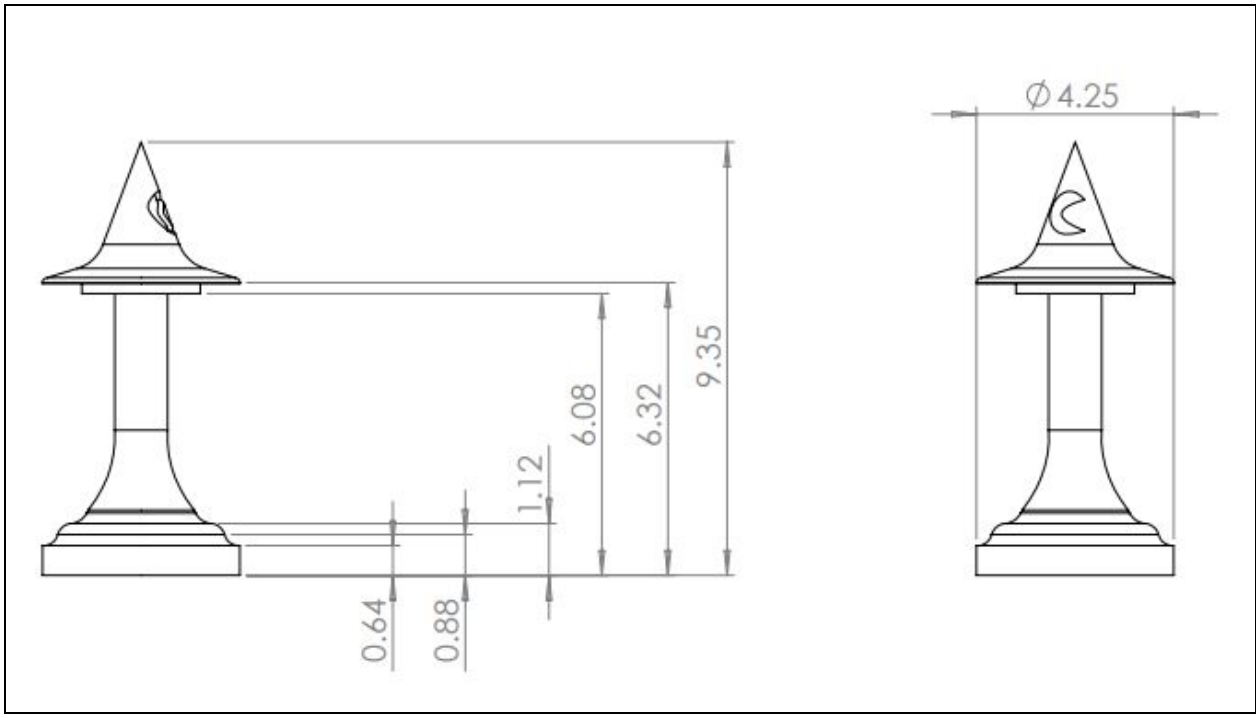
significant work to be better. By using this ranking system it becomes clear what designs are good and which ones are not.

By utilizing the four parameters in the decision matrix it was clear the James' design was the best and we will move forward with it. The only category it didn't receive the best in was appearance. This was due to the fact that it doesn't look super catchy to the eye. However, it ranked the best in every other category. The complexity of this design is simple as it is only a wizards hat on a podium. The podium puts the hat front and center which is why it was ranked best for theme as well. For the last category, 3D printability, it also ranked best because it would require minimal support structures to print the piece. Because of how well the design ranked in these categories we will be moving forward by creating a design that will be 3D printed.

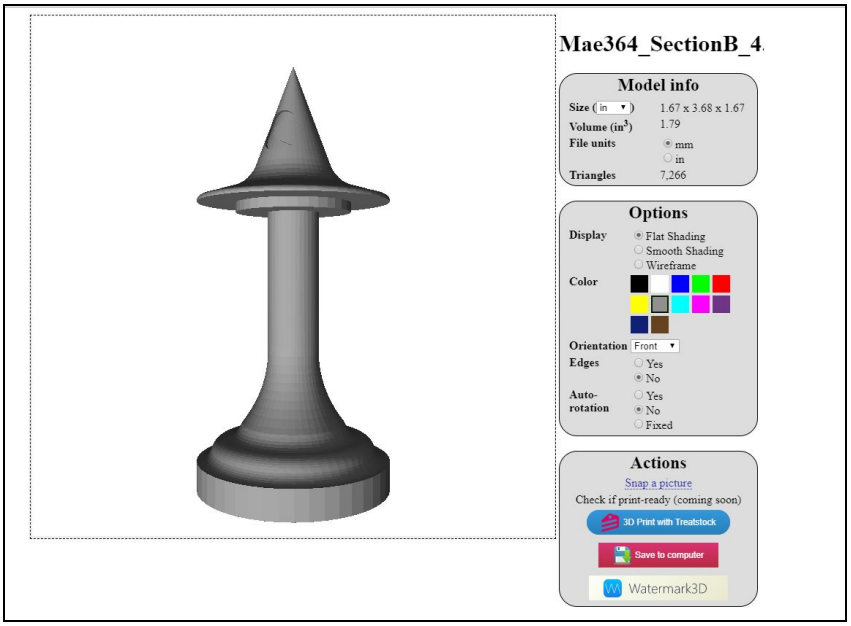
3D MODEL



2D Drawing



3D PRINTING VERIFICATION



PAYMENT VERIFICATION

UB ePay

Transaction Receipt

(Please print this page for your records.)

Account Applied To:	SHAPIRO
Apply Payment To:	3D Printing Services/Printer Use
Payment Date:	03/10/2020
Unique ID:	2020031020214220
Authorization Code:	403028100
Account Number:	**** **** **** ****
Amount Paid:	$36.00

Thank you for your payment. Please bring this receipt with you and show it to laboratory personnel, when pick up your order.

Thank you for your payment.
An e-mail receipt has been sent to vshapiro@buffalo.edu.