

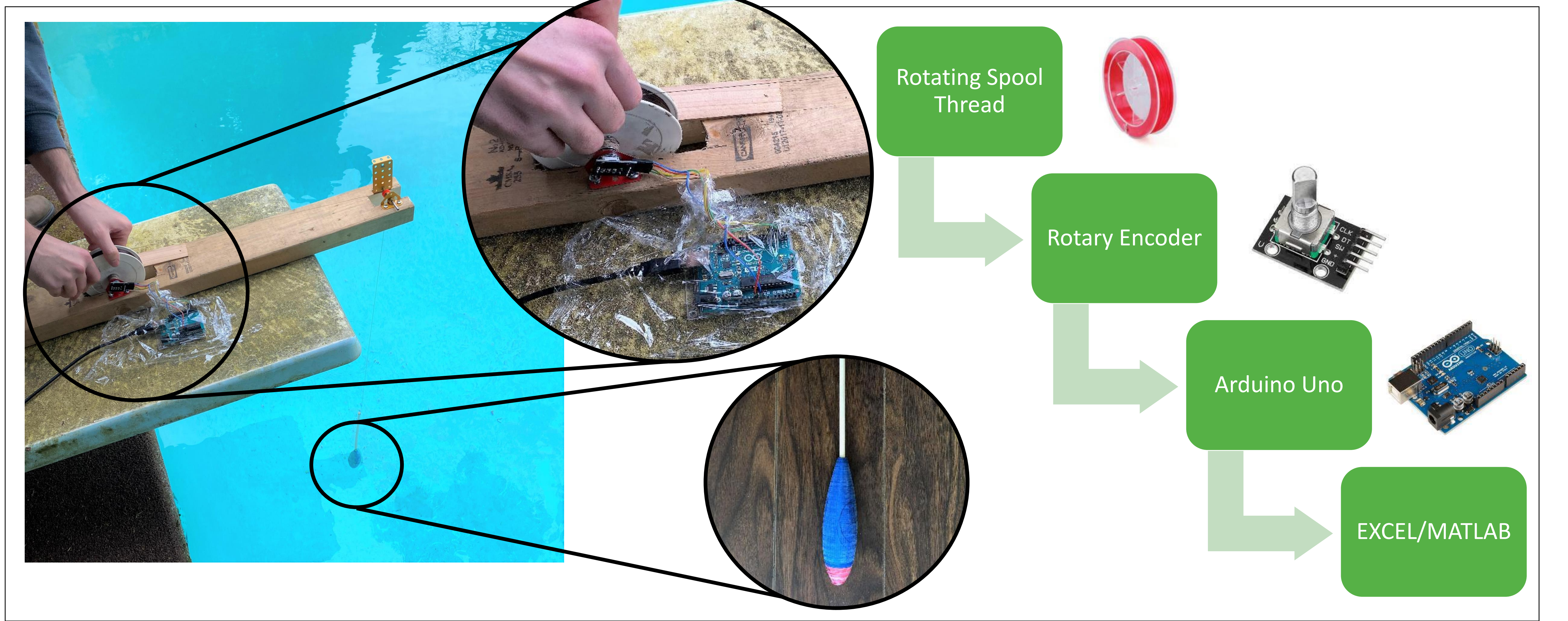
# REDUCING DRAG FORCES ON SUBMERGED BODIES BY VARYING SURFACE FINISH

## TEAM #7

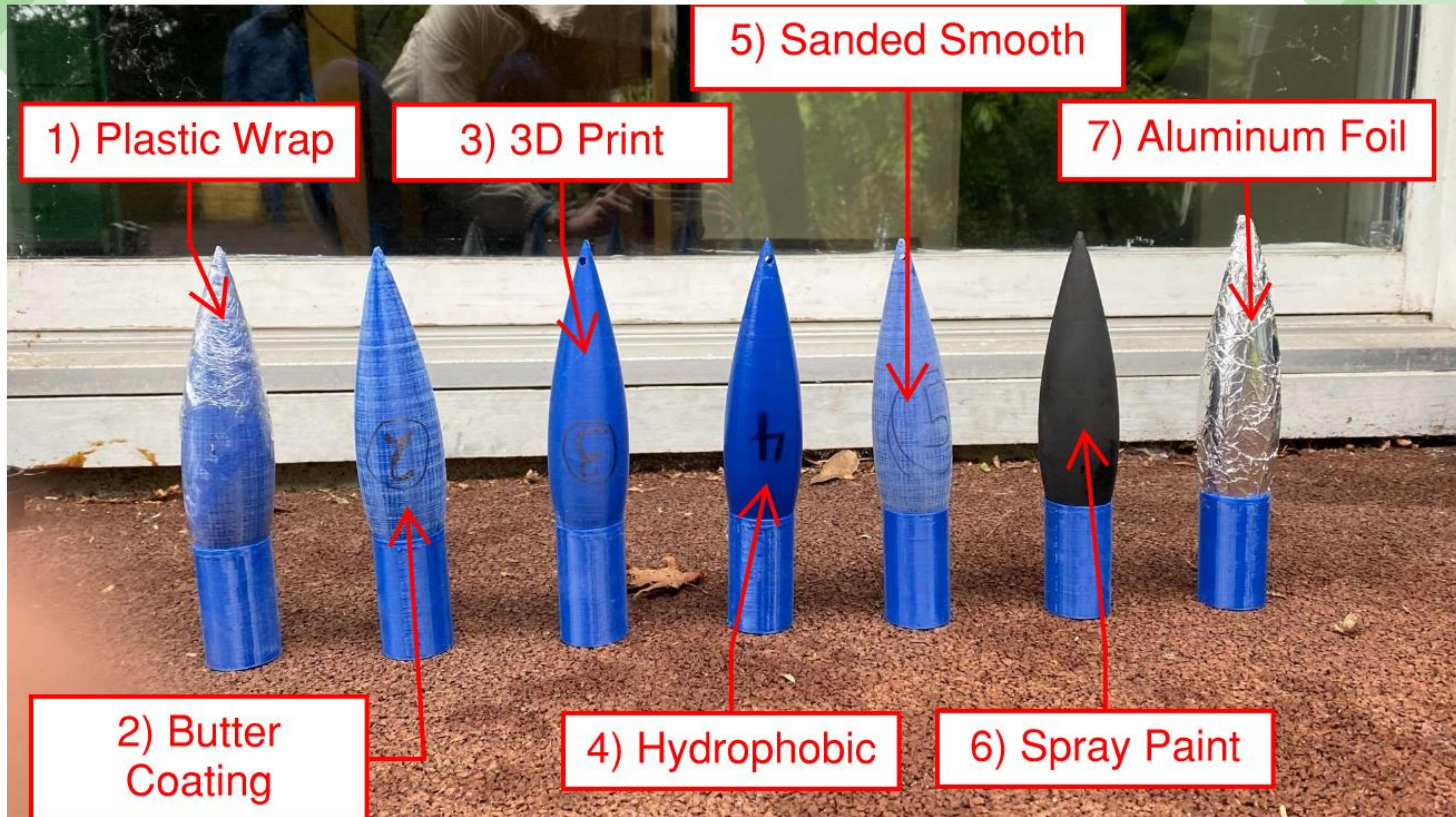
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**PURPOSE:** To find out if there is a relatively simple way to canoe more effectively by observing the effect of varying surface finish on a streamline body and analysing the drag experienced by the body

### MATERIALS AND METHODS:













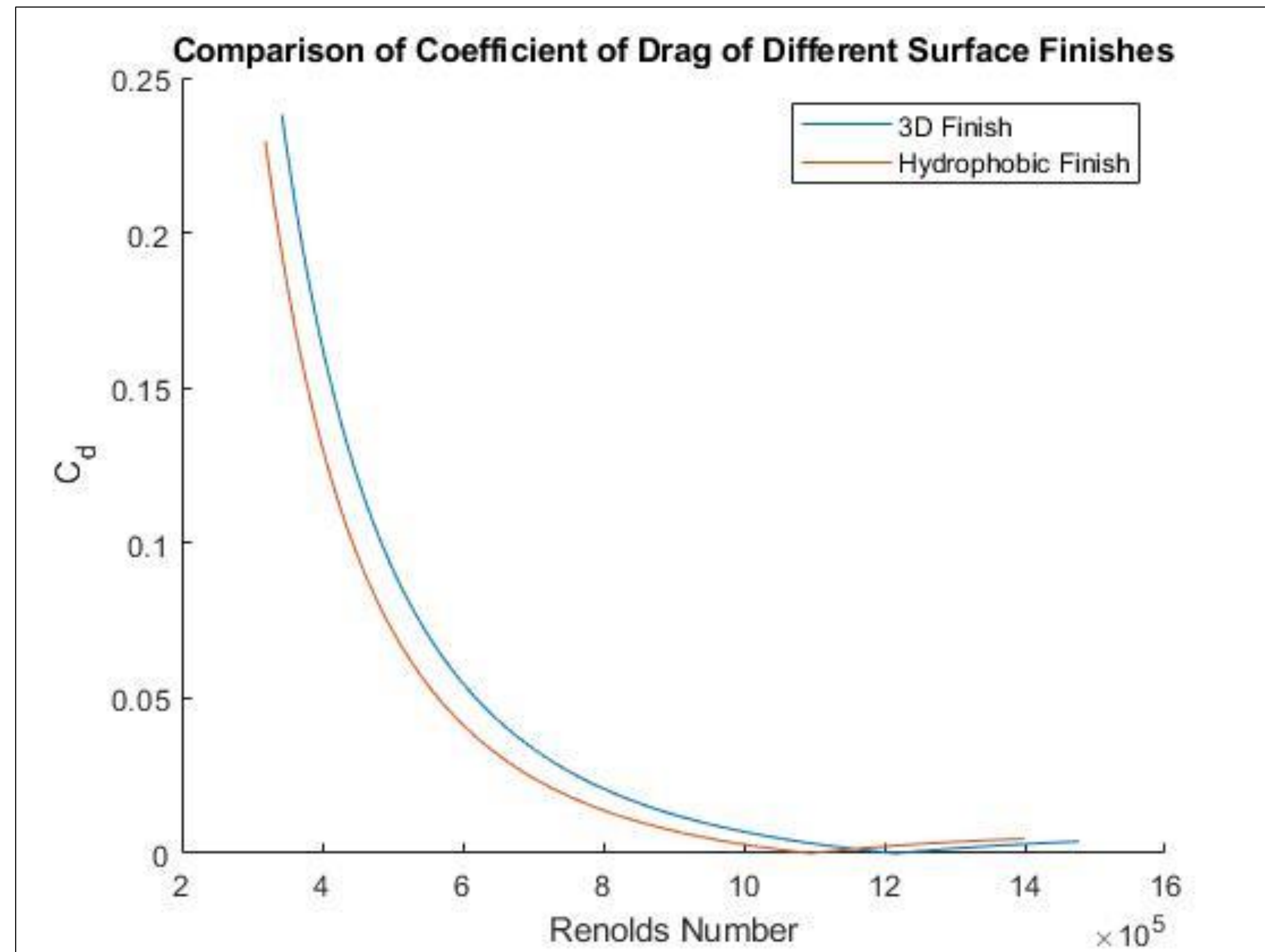
# RESULTS

**Main Conclusion/Result:** Smoother bodies experience lesser drag forces

## RESULTS AND DISCUSSION:

### Statistical Analysis:

- Making the dataset continuous and minimizing random error



# RESULTS

**Main Conclusion/Result:** Smoother bodies experience lesser drag forces

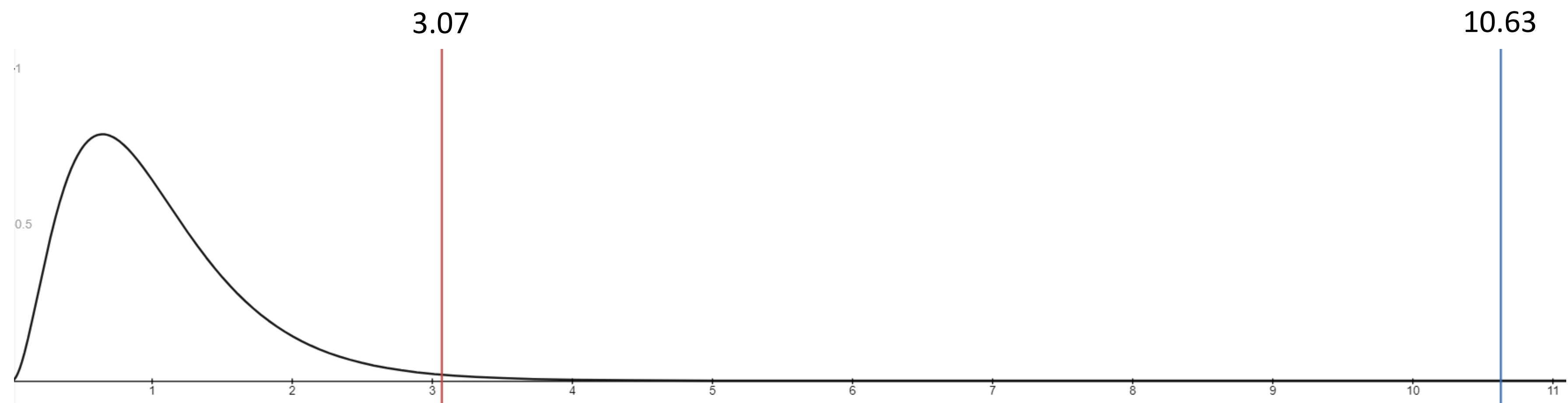
## RESULTS AND DISCUSSION:

### Statistical Analysis:

- F-test to check if there is a significant difference between surface finishes
- Found a significant difference at confidence level of 99%

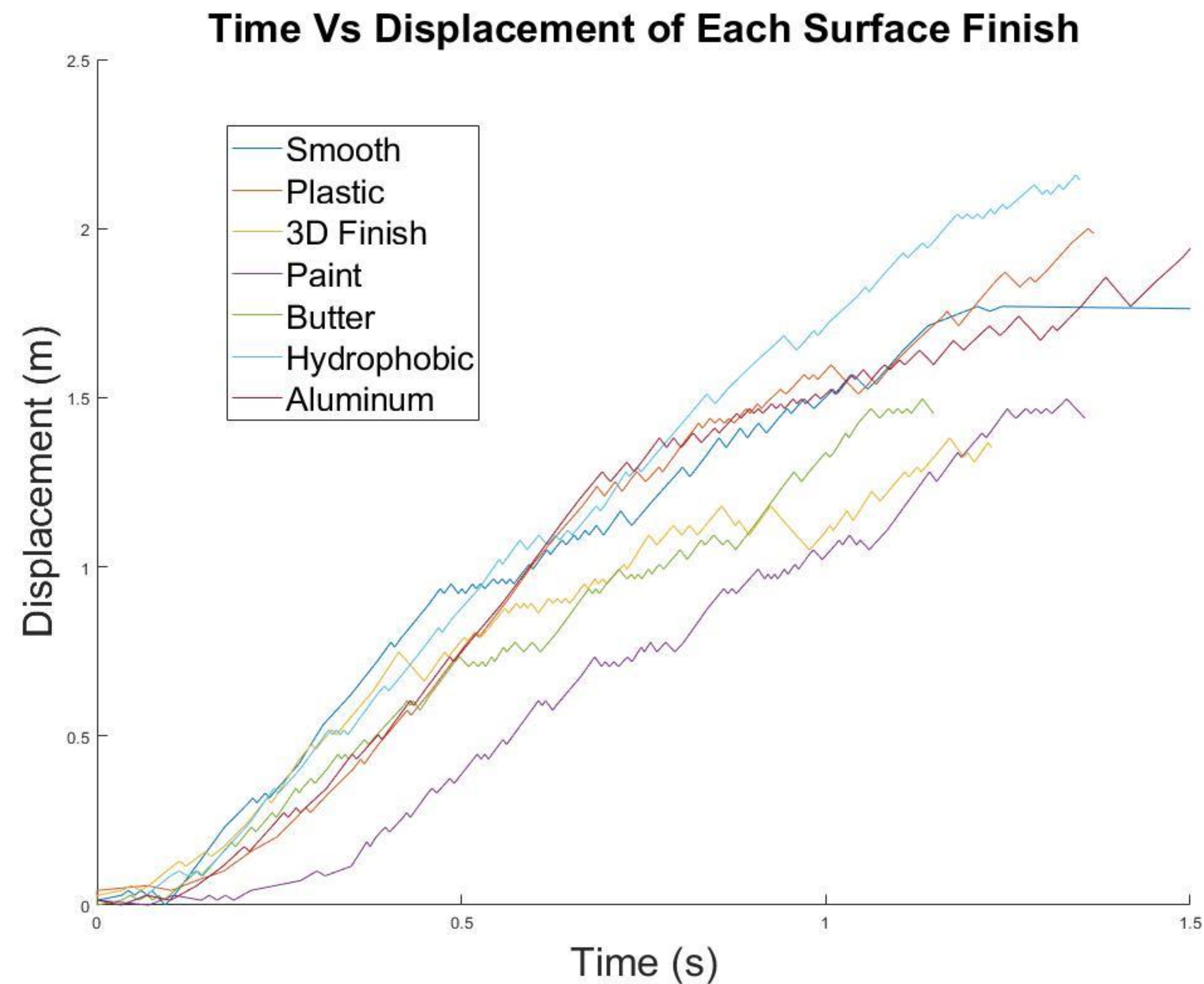
Table 1: Values for the F-Test

F - Statistic	10.63
F - Critical	3.07



F-distribution for confidence level 99%

# DISCUSSION



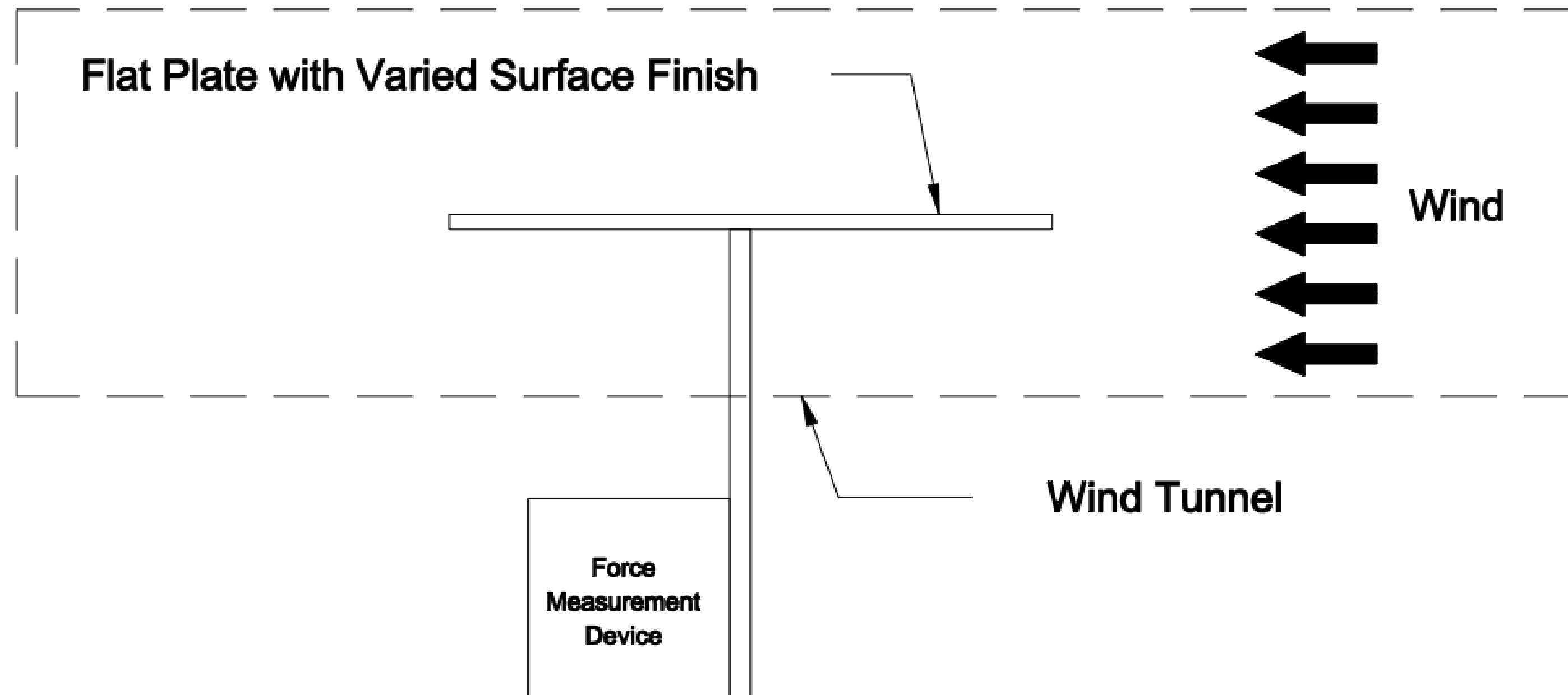
- Our data matches theoretical findings online – low surface roughness objects experience less drag
- Hydrophobic surfaces travelled through water the easiest
- Coating the canoe hull with hydrophobic material will make it easiest to row

# DISCUSSION

## Limitations:

- Depth of the pool was not sufficient to trigger turbulent flow
- Resolution of the encoder limited the number of data points

## Ideal Experimental Setup:



- Few Parameters to Measure
- Major Parameters:
  - Wind Speed
  - Reactionary Horizontal Force
- DOE
  - Multi Factors – one factor at a time
  - Wind: 0m/s - 35m/s
  - Surface Finish: Aluminum, Plastic Wrap, Hydrophobic Coating, Spray Paint, Butter, Smooth