# Machine Predictive Maintenance

Failure Classification

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November, 2022

**Project objective:**
Deliver a product to Northrup Grumman to predict machine failure
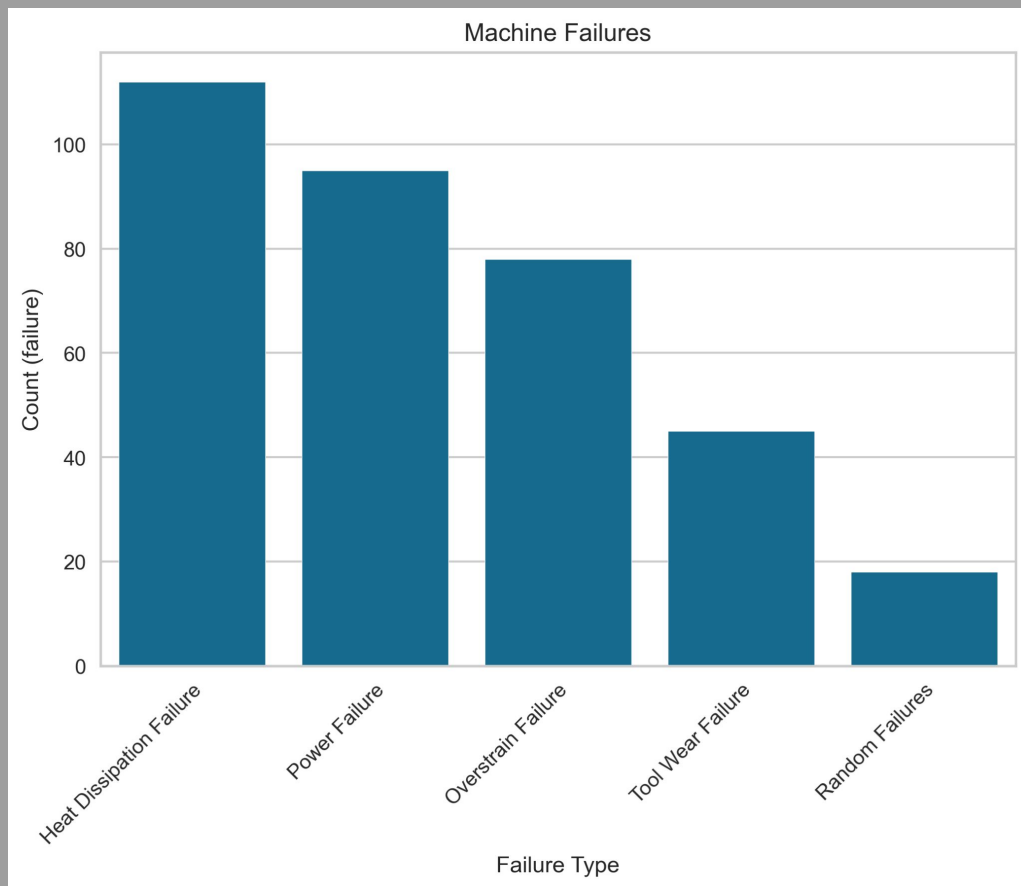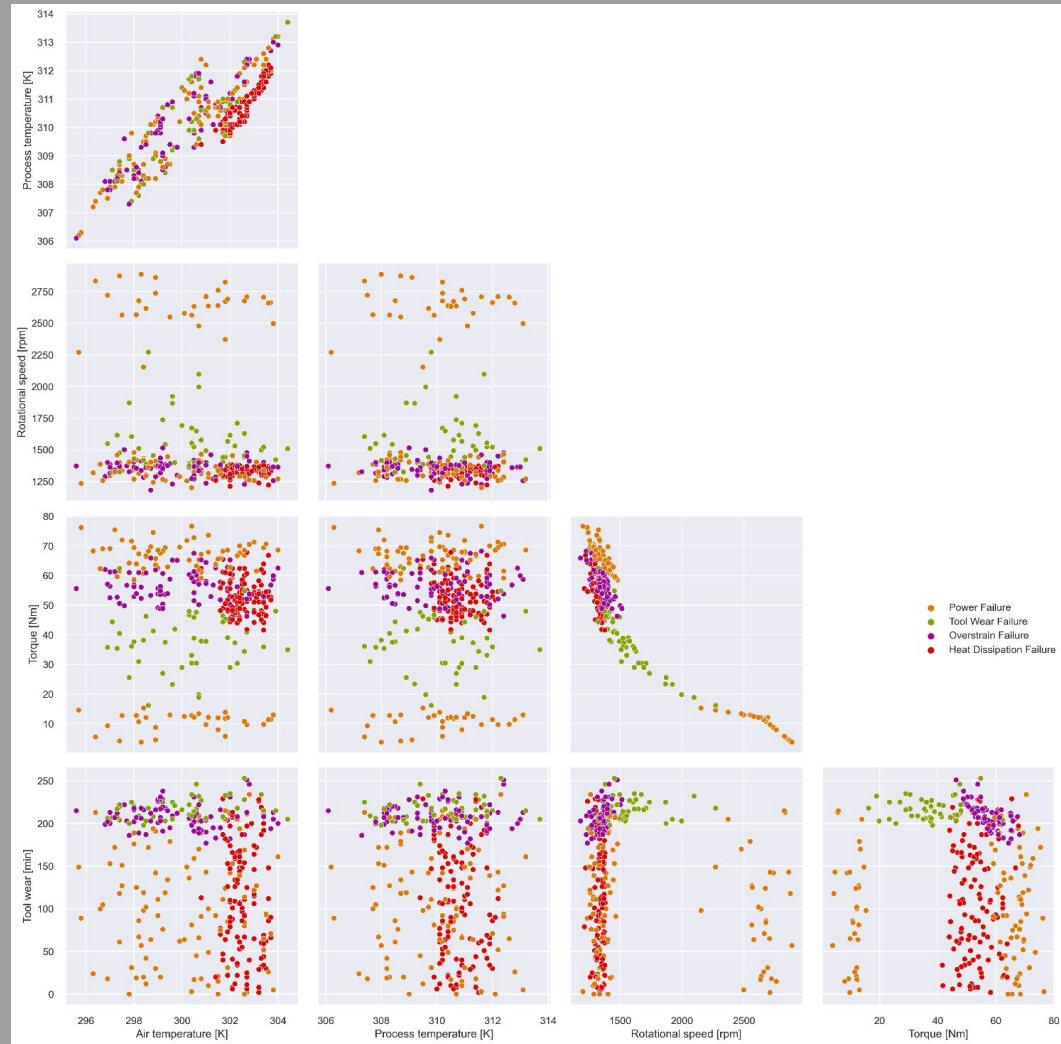
# Data

Northrup Grumman

# Data

| Northrup Grumman |
|:---:|

- Contains a data point for each product run through the machine

- 10000 points in dataset

- Includes information on air temp, process temp, rotational speed, torque, tool wear, and failure
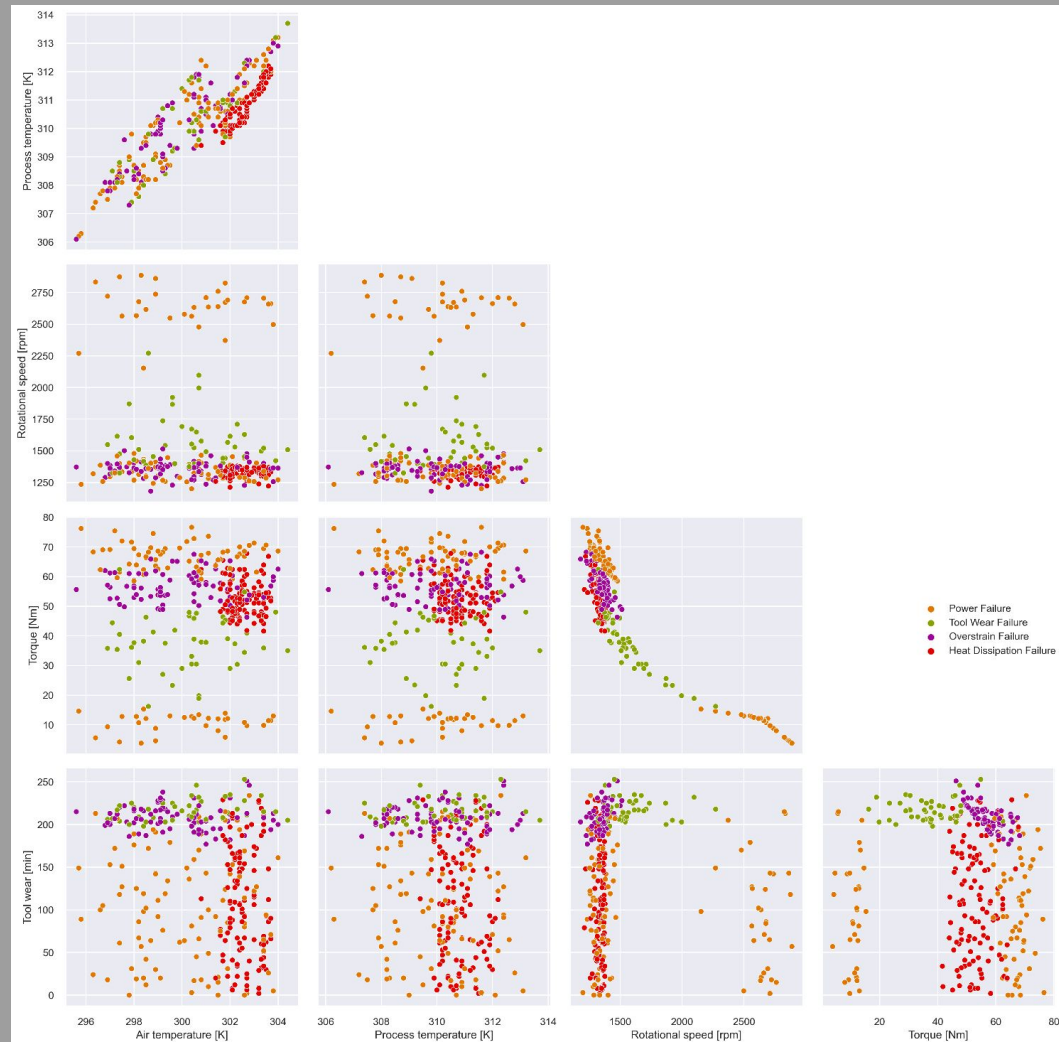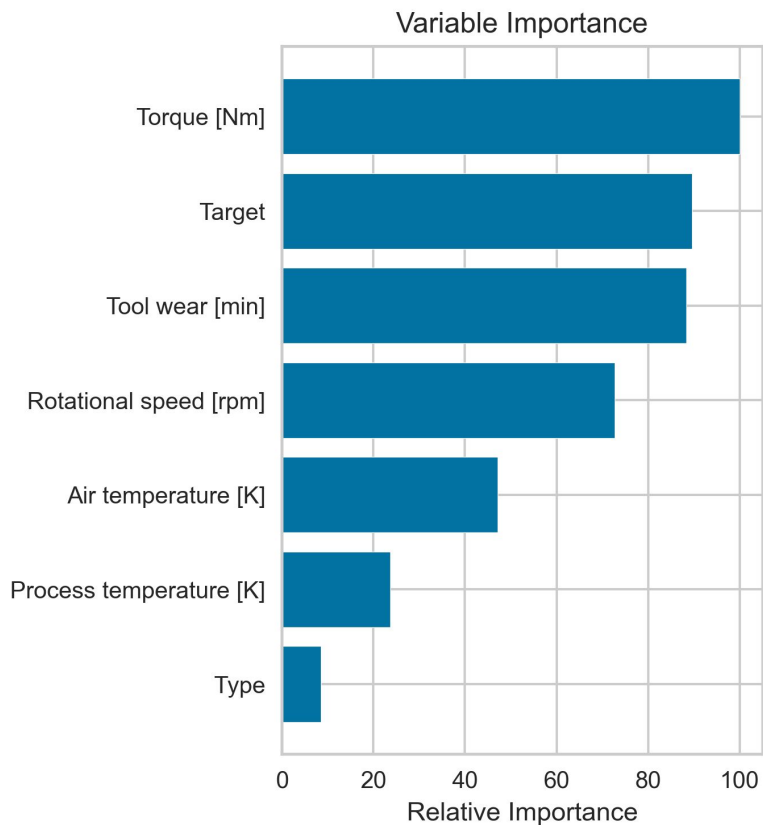
# Range



Machine Failures

# Relationships

# Relationships

# RESULTS



RandomForestClassifier Confusion Matrix

# FUTURE WORK

1. Expand Dataset

2. Alternative machines

# CONCLUSIONS

- Avoid the following to prevent failure:
    - Torque (power failure): less than 20 Nm or more than 58 Nm
    - Tool Wear (tool wear failure): more than 190 minutes of use
    - Rotational speed (overstrain and heat dissipation failure): less than 1200 rpm

- Final model 99% accurate with 97% precision

THANK YOU