Analysis of Lowest Risk Aircraft

With emphasis on Engine Type and Purpose of Flight

Robert Sheynin

Investing in Aircraft

The Problem

- How do we expand our line of business within the bounds of our risk tolerance?
- How do we determine which industries or aircraft are safest?
- Do we have enough data to inform a market entry strategy?

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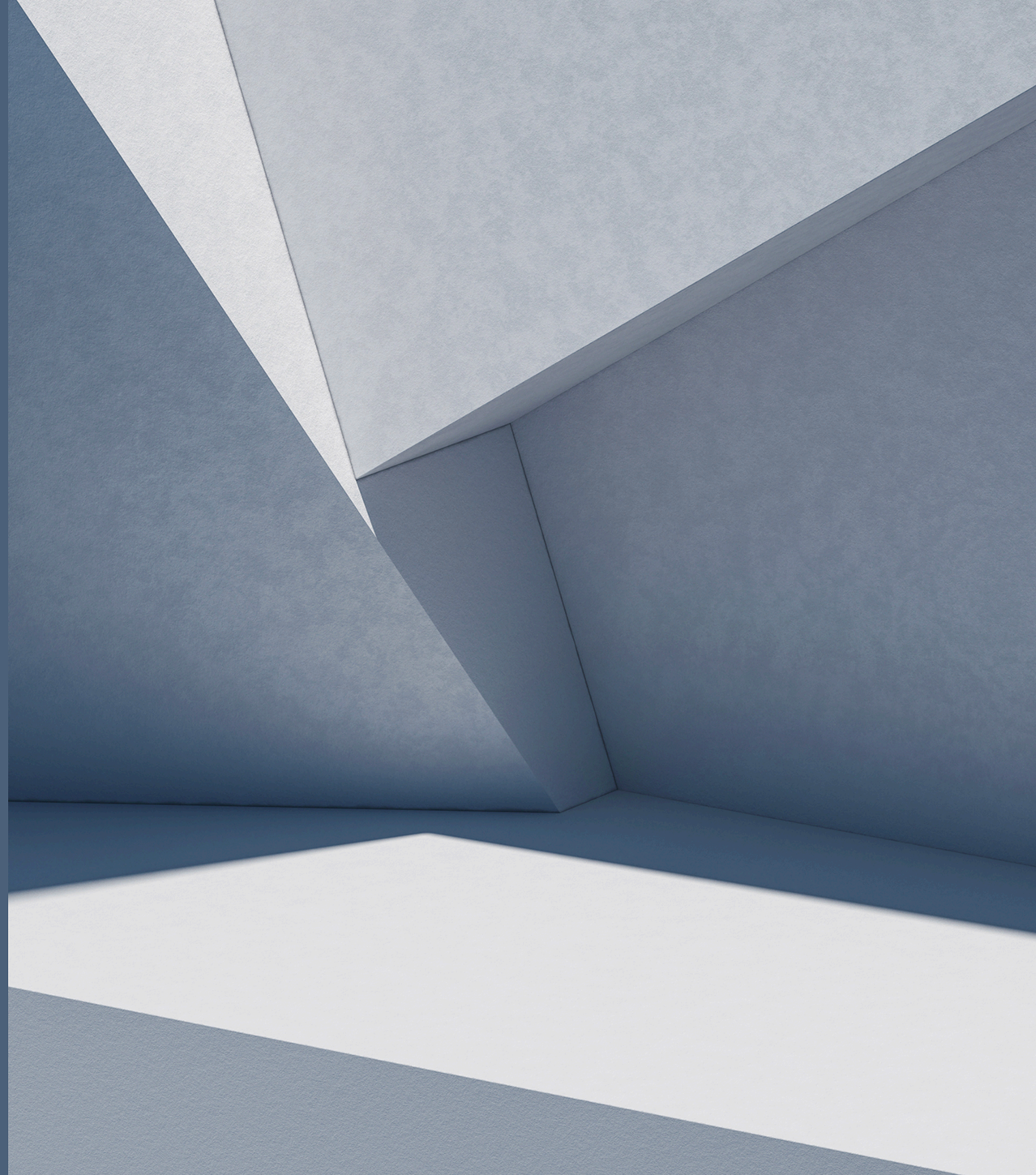
The Solution

- Employ Data Science to extract actionable findings from our dataset
- Data sanitization to focus our analysis on prescient data
- Value imputation from external research to extract more samples
- Correlate and Normalize elements in data to derive Risk

Elements of Analysis

& Relevant Variables

- Focus analysis on actionable variables
  - General Trends in Safety (fatalities over the years)
- Focus on Common Aircraft Features
  - Business Domain (Purpose of Flight)
  - Physical Characteristics (Engine Type)



Methodology

Analysis Ontology & Assumptions

- Focus on Airplanes specifically to make more concrete recommendations
- Conduct research to impute missing valuers and augment extant elements to increase data usability
- Employ descriptive statistics to visualize and understand data
- Remove samples that:
  - Contain too many unique values
  - Contain too many missing values (that cannot be reasonably imputed)
  - Sample values are too few in number (relative to the other feature values)

Methodology

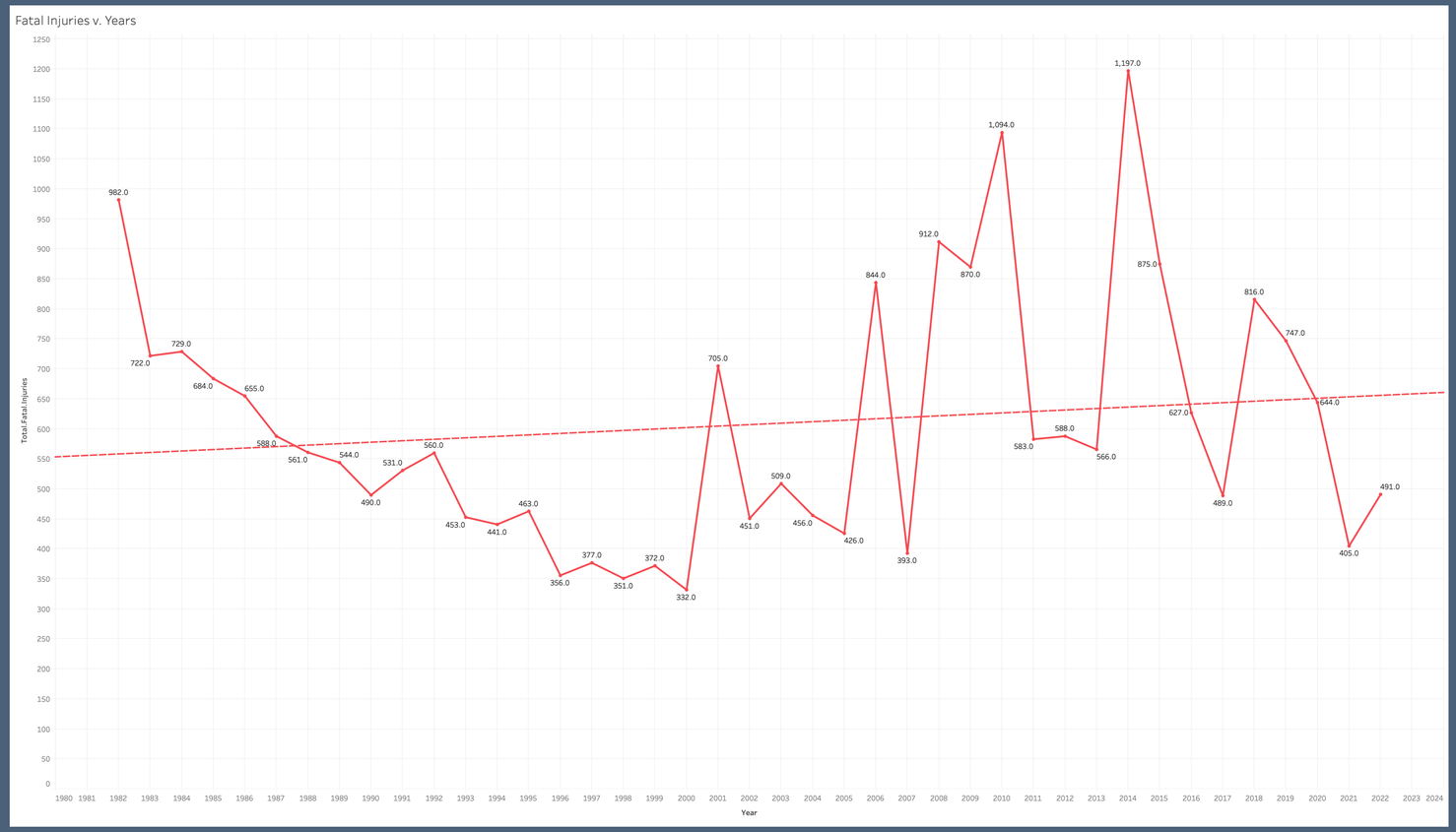
Feature Engineering & Calculating Risk

- There are many ways to assess risk
- The most intuitive factors to risk are:
  - Fatal, serious, minor injuries
  - Total Uninjured
- Using these I constructed a normalized ratio against a particular feature, specifically:
  - Engine Type
  - Purpose of Flight

Findings

Safety over the years

- Total Fatal Injuries in Airplane flights are rising:
  - Any investments should be researched thoroughly
  - We should not invest broadly in aircraft
  - Instead we have to consider Aircraft investments in a more scoped context



Findings

Feature specific analysis

- Purpose of Flight (Industry) with fewest Fatal Injuries to Total Injurious flights:
  - Banner Tow
  - Instructional
  - Aerial Application (Agricultural)
- Engine Type with fewest Fatal Injuries to Total Injurious flights:
  - Turbo Fan
  - Reciprocating

Problem Solution

& How Recommendations were determined

- Solve for the least risky aircraft investments by prioritizing fatality rates
- Use Feature engineering to organize, assess, and visualize candidate investments
- Consider macro and micro features in the dataset to determine:
  - General trends in the industry over the years
  - Specific feature analysis eg. Engine Type to make concrete recommendations

Recommendations

& Conclusions

- Data shows that fatal injuries have actually increased over the years:
  - Do not recommend broad investment in aircraft
- Invest in the following industries to minimize risk:
  - Banner Towing
  - Instructional
  - Aerial Application (Agricultural)
- Invest in manufacturers or industries using Turbo Fan based engine architectures

Considerations

& confidence, limitations and enhancements

- There are many ways to assess risk so another metric could have been used
  - Further analysis would be required to determined which metric is more statistically relevant
- The dataset includes considerable amounts of irregularities and missing values and required considerable assumptions to coerce which may have produced further irregularities in the findings.
- Enhacements to this analysis could made if more time were spent on:
  - More data sanitization
  - More data
  - More external research to impute missing values

Questions and Answers

& Thank you

Robert Sheynin