Artificial Intelligence & Aviation: A Content Analysis

Victor E. Morales  
*Florida Institute of Technology*

Jonathan Escalera  
*Florida Institute of Technology*

Jose Sanchez  
*Florida Institute of Technology*

Brooke Wheeler  
*Florida Institute of Technology*

Vivek Sharma  
*Florida Institute of Technology*

Follow this and additional works at: https://repository.fit.edu/aero_student

Part of the Aviation Commons

**Recommended Citation**
https://repository.fit.edu/aero_student/15

This Poster is brought to you for free and open access by the College of Aeronautics at Scholarship Repository @ Florida Tech. It has been accepted for inclusion in Aeronautics Student Publications by an authorized administrator of Scholarship Repository @ Florida Tech. For more information, please contact kheifner@fit.edu.
Abstract

Annual rates of "AI and Aviation" publications were collected from the Advanced Technologies & Aerospace Database (ATAD). The regression model indicated a significant positive trend in aviation AI publications from 2013 - 2023.

Background

Active and prior research determined the feasibility of Artificial Intelligence (AI) applications in different aspects of aviation, such as improvements to airside airport operations (Saraf et al., 2020). Proposals help predict future trends of potential AI applications in aviation (Kulida & Lebedev, 2020).

Examining other content analyses contributed to building a proper content analysis (Li et al., 2020). The literature indicates that there is growing interest in AI in the aviation industry; therefore, this research examined the recent trends of peer-reviewed publications discussing AI and aviation.

Purpose & Research Question

The purpose of this study was to analyze the trends in publications discussing Artificial Intelligence (AI) in Aviation within the period 2013 to 2023.

What is the trend of AI in aviation publications from 2013 to 2023?

Methodology

- We collected the number of publications for each year from the ATAD for the following search terms: "AI and aviation", "artificial intelligence and aviation", "AI and aircraft", OR "AI and aircraft safety".
- The number of publications for each year were recorded in an Excel file.
- From 2023, only publications from January 1 to October 31, 2023, were collected. The estimated total publications for the entire year of 2023 was calculated as follows: x = 497(12/10).
- The descriptive statistics and linear regression were calculated using R-Studio version 4.3.1.

Results

After collecting the data, an estimate for 2023 was calculated: 597 total publications. Table 1 shows descriptive statistics, with an average of 374 AI and Aviation publications per year during the time-period.

Table 1. Descriptive Statistics for AI and Aviation Annual Peer-Reviewed Publications 2013 - 2023

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publications</td>
<td>374</td>
<td>320</td>
<td>238</td>
<td>681</td>
<td>148</td>
</tr>
</tbody>
</table>

Note: Annual publications were collected from ATAD. Year 2023 only accounts for 10 completed months (January 1, 2023, to October 31, 2023), so the annual publications for that year were estimated.

The dataset collected contains the publications meeting the search term criteria for each year in the ATAD. The collected data was placed into a spreadsheet, imported into RStudio for analyses.

Figure 1 illustrates the scatterplot of all data and the linear regression model. The linear regression model was statistically significant. Both the Slope (39x) and Intercept (-78695) were statistically significant (p= .0004). The R-squared for the model was .77, which indicates a good fit of the model to the data.

Discussion

The expectation of a positive trend in publications was met. The linear regression indicated a positive relationship for AI aviation publications from 2013 to 2023. The R² (.77) shows that 77% of the variance in AI publications can be explained by the year, and the model is relatively good fit for the data.

Even with specific search criteria, there is potential risk that some publications counted were not actually on the topic studied due to differences in terminology.

Within the parameters of this study, only a linear regression model was used to predict future trends rather than to observe trend growth. Figure 1 shows the linear regression; however, the relationship may be exponential. The analysis should be checked with the actual 2023 publication count.

The results show rapid growth in publications discussing AI and aviation. This subfield in aviation is gaining more attention. This is important because it indicates area of rapid growth in aviation. AI research may change how the industry operates with new technology. Content analyses such as this can clarify research and industry trends in aviation.

Future Research

Investigating the growing trends and applications also has potential future research considerations. Further research into the considerations of governments, companies, and agencies to introduce any form of integrating AI in the aviation industry is an opportunity to investigate these trends. Additionally, this research can assist in exploring any further applicability into the aviation industry.

References

