

MACHINE LEARNING & ARTIFICIAL INTELLIGENCE IN AEROSPACE INDUSTRY

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Artificial intelligence plays a significant role in cutting costs, reducing the design cycle time, simulation, prototyping, optimization, maintenance, manufacturing and updating products and is all set to drive many developments in the aerospace sector in the next 15 years. Advances in AI could help aerospace companies optimize their manufacturing processes. However, there is limited adoption of machine learning techniques in the aviation industry and the main reason for this is the lack of access to high-quality data, increased dependability on simple models as compared to complex models and a lack of skilled workforce and partners to implement it effectively.

But with the right partner, AI can be a disruptive technology that will impact the efficiency, productivity as well as speed and innovation of the aerospace companies.

Let's explore the various areas in which AI and machine learning is being used in the aerospace industry today along with some real-life examples and case studies.

Here are the top areas that AI is being used by aerospace manufacturers today:

Predictive Maintenance

Aircraft maintenance needs to ensure its safety. There are many unexpected maintenance issues concerning an aircraft. Aviation companies are using predictive maintenance enabled by AI to resolve these issues. Predictive maintenance allows for faster identification and reporting of potential failures in real-time. It predicts the repair timeline and ensures that the process schedule is smoother and faster. A huge amount of data is given as the input and with use of AI and predictive maintenance solutions, data points and meaningful insights are deduced as output. The entire process helps in fixing an issue before it arises.

Optimized flight performance

Fuel efficiency is one of the top parameters of aerospace OEMs and this can be optimized with the help of artificial intelligence. Any minor improvement in fuel efficiency can have a major impact on the aircraft's emission and this is achieved by manufacturing lightweight aircraft components. AI is helping pilots during flights by analyzing critical data like the fuel system, system status, weather conditions as well as other major parameters that can be assessed in real-time to optimize a flight path. Additionally, AI helps in optimizing time-consuming activities in the aerospace industry and paves the way to better human-machine collaboration.

Generative design

Artificial intelligence is increasingly being used to create efficient, faster and lighter parts in the aerospace industry and is applied to find innovative ways to design

them. Based on the existing requirements new innovative product designs are being created using machine learning techniques. Multiple options are available in a very short span to find the best design, making it easier for engineers and product designers.

Efficient supply chain management Implementing

AI in the supply chain is making operations in the aviation industry more streamlined. Increased supply chain efficiency enables maintaining the equipment and its regular repairs much easier than doing it manually and also saves money and cuts the downtime as it is known before knowing exactly when to conduct the repair tasks. Automated data collection makes it easy to improve the efficiency of supply chain management.

Improved quality control

Quality assurance is all about ensuring that the desired level of quality in a product or service is maintained. This is done by giving a special level of attention during every stage of the process of production. By automating the QA with the help of an autonomous AI solution can save a lot of time and resources. Automating quality testing with the help of machine learning has increased the rate of defect detection by almost 90%.

Training

Artificial intelligence can be used to enhance pilot training facilities with pilots being provided with a realistic simulation experience with the help of AI-enabled simulators coupled with virtual reality systems. These simulators can also be used to collect and analyze several data with regards to training for creating personalized training data with biometrics to track an individual's performance. The aviation industry relies heavily on data that are derived from a great deal of research, design, and production of its products and services. Machine learning has played a major role in developing the aerospace industry by providing valuable information that might otherwise be difficult to be obtained via conventional methods.

References:

1. Machine Learning & Artificial Intelligence in Aerospace Industry URL: <https://www.axiscades.com/blog-resources/whitepaper/Aerospacewhitepaper.pdf>

Keywords: Artificial intelligence, machine learning, predictive maintenance.