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MACHINE LEARNING CAN CHANGE FUTURE OF AVIATION

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Abstract: Artificial intelligence (AI) has often been advertised as the answer to many evolving issues in the industry – from greater cost efficiencies to enhanced resilience and passenger experience. Yet, the adoption of AI has been slow. Although there have been pockets of data science innovation – from check-in to cleaning robots and chatbots – the full potential of intelligent automation has seemed some way off. Being able to expand and automate the collection of data across the airport, and then intelligently analyse and interpret it, is one area where operators can derive massive value from AI capabilities. AI uses powerful algorithms that digest large amounts of data and identify patterns. In an airport, these are used to predict how long processing will take by analysing factors such as queue length, productivity and how many security lanes are open Machine learning, a subset of AI, improves how algorithms recognise patterns on their own. It is the foundation of the continual feedback loop, needed to improve outcomes, based on learning from past events. It is also how airports can increase automation for greater efficiency and mitigate the risks inherent in 'institutional knowledge' in a significantly smaller workforce.

Index Terms **– Artificial intelligence, machine learning**

I. INTRODUCTION

Airline companies have a tremendous amount of past data about flight delays and can easily source the weather data from various other portals. Combining the two sets of data sources can help the companies better plan for the upcoming delays if any, in-flight departures or arrivals.

Aircraft using ml can save lot of fuel and money of airlines. Aircraft companies are developing such aircraft that can taxi it self from gate to runway by mapping the airport in best way possible and at same time have control on thrust of aircraft saving fuel for airline.

ATC structure is a staggering structure; the usage of framework proliferation of an aeronautics expert system is a basic research gadget. Existing proliferation instruments have two issues, one, in perspective of single focused hard to do broad scale reenactment of minute amusement; Second, the nonappearance of a straightforward controller reenactment association limits (Hwang, Kim and Tomlin, 2007) for these two request, the appropriated man-made consciousness multi-specialist advancement in air terminal direction diversion; and used Java lingo to develop a national avionics expert system in perspective of the field of the main model multi-operator common control propagation. Close by the relentless change of basic flight, the significant scale advancement of various plane terminal workplaces, the central air terminals are changing from the primary single-air terminal area to the multi-air terminal district with a particular ultimate objective to achieve the examination of the honest as far as possible assessment of the jumbled multi-air terminals terminal zone, all the more great and complete the process of mirroring game plan of the multi-plane terminals terminal region ought to be made. A Multi-agent system (MAS) is an automated structure made out of different participating shrewd Agents inside an area. Multi-operator systems can be used to deal with issues that are troublesome or unfathomable for an individual special-ist or a strong structure to get it. Information may fuse some methodic, down to earth, procedural or algorithmic chase.

2. IMPLEMENTATION OF ML IN AVIATION

Artificial intelligence is seeing increasing adoption in a wide variety of industries and it is currently being used in numerous aspects of airports, due to its ability to process vast amounts of data and streamline tasks and procedures. Here are some examples;

2.1 Recommendation Engine

One of the ways artificial intelligence is used at airports is in the recommendation engines. Recommendation engines are common in popular online services from Netflix to Amazon and you will find them in countless travel-booking providers as well.

The AI platform analyzes historical data of the passenger like past reservations, behavior-tracking techniques, metadata, purchase history and real-time data to highly personalized offers to passengers, increasing retention and a customer's lifetime value.

2.3 Chatbots/ Bots

can direct users to specific services or outlets, provide flight information updates and more, freeing up staff to focus on activities that are more valuable and reducing human contact.

Chatbots and customer service automation is human-like, understands simple questions and responds in a casual, conversational style. Using chatbots, airports can provide 24/7 customer assistance and reduce the human contact.

2.4 Baggage Screening

Passenger checked baggage is screened more efficiently using an Artificial Intelligence-based, robotic assisted convenience system, which quickly troubleshoots and diverts high-risk baggage for deeper inspection. Today's AI-powered facial recognition solutions for live video give insights into how individuals are moving through the space and enable much faster access.

2.5 AI Thermal cameras / AI based video analytics

Facial recognition and fever detector AI Thermal cameras used for detecting passenger with fever. AI-based video analytics uses algorithms and computer vision technology to look at video feeds, commonly taken from cameras to detect patterns and trends. The analysis happens in real-time and delivers actionable intelligence such as crowd gathering, people's emotions and behaviors, general heat mapping, etc.

3. SOME WAYS FOR ML IN AVIATION

The time spent by the customer in check-in and check-out procedure at the airport adds to the travel time and can sometimes be more than the travel time. Airlines can drastically improve on the customer experience by providing a smooth transition and reducing the waiting time at the source and destination airports.

For instance, an artificial intelligence technology using facial recognition can help to ease the check-in process by comparing the photo in the passport with the actual image of the customer. The data can also be linked to the check-in baggage thereby making the collection of the baggage simpler at the destination airport. This also eradicates the chance of customers picking up the wrong baggage at check-out. It also improves the security at the airport by mapping the baggage to the customer in case of any prohibited items in the bags

4. FUTURE REFERENCE FOR ML AVIATION

Most amazing future reference is ATTOl (autonomous taxiing takeoff and landing) currently airbus is working on it ,we might be able to see it in near future A fully autonomous system would be a huge step, says Airbus, to "help pilots focus less on aircraft operations and more on strategic decision-making and mission management.

The ATTOL system relies heavily on computer vision and machine learning, and uses a raft of cameras, as well as radar and LiDAR, to build awareness of its situation. The system was fitted to a full-sized Airbus A350-1000 airliner, capable of seating more than 400 passengers, which ran some 450-odd fully human-controlled flights to gather video data and fine-tune control algorithms, before being sent out to handle business by itself.

In January this year, ATTOL performed the first fully-automated vision-based take-off at Toulouse-Blagnac airport.

5. CONCLUSION

The aviation industry, especially the commercial aviation sector, is constantly striving to improve both the way it works and its customer satisfaction. To that end, it has begun using artificial intelligence Though AI in the aviation industry is still in the nascent stage, some progress has been made already as certain leading carriers invest in AI. To start with, certain use uses are being implemented such as facial recognition, baggage check-in, customer queries and answers, aircraft fuel optimization and factory operations optimization. But AI can potentially go far beyond the current use cases. To make a long story short, AI can redefine how the aviation industry goes about its work.

The use of artificial intelligence in aviation has made many tasks easy for airlines and airport authorities across the world. From identifying passengers to screening the bags and providing fast and efficient customer care solutions.

Unlike the software industry, the risks of real life harms are exponentially higher in the aviation industry. While other industries have started using this technology long back, the adoption of AI in aviation has been one of caution, and rightly so. As the aviation industry embraces the benefits of artificial intelligence and machine learning, it must also invest in putting in place checks and balances to identify, reduce and eliminate harmful consequences of AI, whether intended or otherwise. As Silicon Valley reels in ethical dilemmas, the aviation industry will do well to learn from Silicon Valley while making a transition to a smart future. The aviation industry known for its rigorous safety measures and processes may, in fact, have a thing or two to teach Silicon Valley when it comes to designing, adopting and deploying AI systems into live systems that have high-risk profiles.

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