SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

7 November 2020 – 8 January 2021

TOPICAL REPORT

AVIATION

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YEAR AHEAD

What's Ahead For Airlines And Aviation In 2021

"Air travel demand could snap back quicker than many in the industry are predicting, but dark clouds are forming in China for aircraft makers. From what coronavirus vaccines mean for airlines to how new FAA rules could jump-start commercial drone activity, here's what Forbes' expert aviation contributors expect in the year ahead."
Source: Forbes

What may lie ahead for aviation in 2021?

"None of us know how the fight against the most economically damaging phenomenon of most of our lifetimes will go. But we dare to believe that the coming year will be better than the one just gone. Here are our 2021 forecasts."
Source: Flight Global

AVSEC2020: ICAO inaugurates 2021 as Year of Security Culture

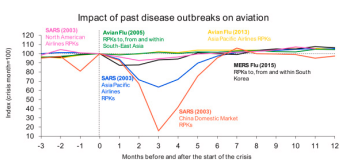
"ICAO Secretary General Dr. Fang Liu ended off the fourth annual ICAO Global Aviation Security Symposium (AVSEC2020) by inaugurating 2021 as the Year of Security Culture. In her closing remarks to last week's virtual event, which concluded on Friday

FORECAST

Forecasting the Global Supersonic Business Aviation Flight Movements Up to 2050

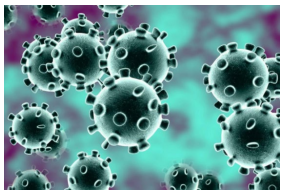
"Business aviation is typically the primary travel mode chosen by ultra-high-net-worth (UHNW) individuals and top executives. Business aviation passengers prefer the exclusivity associated with business jets, and are typically constrained by time and not cost when traveling…To better understand the potential size of the supersonic business aviation market and the extent of the future supersonic business flight network, this study utilizes a unique methodology that combines top-down and bottom-up approaches to forecast global supersonic business flight movements up to 2050."
Source: Aerospace Research Central

AVIATION SECTOR RECOVERY



Post pandemic aviation market recovery: Experience and lessons from China

YEAR AHEAD



Guest column: Max Hirsh on strategies for restarting aviation in 2021

"With vaccines on the horizon, Max Hirsh, Managing Director of Airport City Academy and owner of the airport thought leadership website airport urbanism.com, believes there is light at the end of the dark COVID-19 tunnel for airlines and airports. Here, he offers three key strategies to relaunch the aviation sector for the coming year."
Source: The Moodie Davitt Report

Deep Losses Continue Into 2021

""This crisis is devastating and unrelenting. Airlines have cut costs by 45.8%, but revenues are down 60.9%. The result is that airlines will lose $66 for every passenger carried this year for a total net loss of $118.5 billion. This loss will be reduced sharply by $80 billion in 2021. But the prospect of losing $38.7 billion next year is nothing to celebrate. We need to get borders safely re-opened without quarantine so that people will fly again. And with airlines expected to bleed cash at least until the fourth quarter of 2021 there is no time to lose," said Alexandre de Juniac, IATA's Director General and CEO."
Source: IATA

and brought together over 1,500 global aviation security experts and officials, Dr. Liu noted that the over-arching goal with the Year of Security Culture initiative will be to raise security awareness in aviation operations and have the entire sector thinking and acting in a security-conscious manner."
Source: ICAO

21 Things To Expect From Commercial Aviation In 2021

"2020 has been a year that the airline industry will want to forget. Nonetheless, many lessons would have been learned and these will be taken into the new year. Let's take a look at what we can look forward to in 2021 now that it has finally come."
Source: Simply Flying

Airlines Bet On Traffic Comeback In Second Half Of 2021

"First a disclaimer: Shortly after the global outbreak of the novel coronavirus pandemic starting in March 2020, airlines began to suspend their financial guidance. They found it impossible to predict their performance over the ensuing months, let alone longer term. The International Air Transport Association (IATA) also had to revise its forecasts downward several times throughout the year as the crisis became deeper and longer than it had anticipated."
Source: Aviation Week

YEAR IN REVIEW 2020

IATA: Some Airlines Won't Survive To See Aviation's Recovery

"The International Air Transport Association (IATA) today presented its revised outlook for the airline industry. As expected, it's a pretty bleak synopsis, with a net loss of $118 billion forecast for 2020. However, the association believes that things could look up in 2021, with a 'vaccine bump' expected during the fourth quarter, although it warns that some airlines may not survive to see this recovery."
Source: Simply Flying

12 wild things that happened in aviation in 2020

"This was a heinous year for the aviation industry. Absolutely horrendous, in fact.
But among the gloom there were some lighter, crazier, even hopeful

"China was the first aviation market in the world hit hard by COVID-19 and has been recovering gradually as the pandemic became largely under control within mainland China. This study reviews the recovery pattern influenced by the Chinese government's aviation policy choices, in the hope that our discussions and findings will help improve aviation policy responses elsewhere."
Source: Elsevier

Pandemics and environmental shocks: What aviation managers should learn from COVID-19 for long-term planning

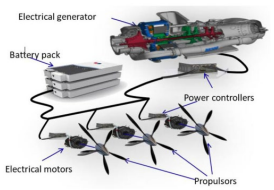
"This article gives guidance to aviation managers being struck by environmental shocks. The introduced frameworks support aviation managers to think strategically during times of shocks and help them to prepare for future shocks by developing more resilient and learning organizations. Practical, short-term recommendations include strategically orienting or reorienting and not exaggerating the current, short-term developments due to unproductive uncertainty."
Source: Elsevier

COMMERCIAL AVIATION

Creating Formal Characterizations of Routine Contingency Management in Commercial Aviation

"In this work, safety-producing behaviors are identified and abstracted into resilient performance strategies. Production rules that encapsulate these strategies are then generated and classified in the Soar cognitive architecture. The strategies are then applied to a remotely-operated air cargo example to demonstrate how safe learning is facilitated. The learned rules and strategies are then formally verified."
Source: Aerospace Research Central

ELECTRIC AVIATION



Reliability in the era of electrification in aviation: A systems approach

CAPA outlook - international air travel to struggle to get off the ground in 2021

"CAPA Founder and Chairman Emeritus, Peter Harbison, has issued a blunt warning to the global aviation and travel industry at the outset of 2021 – that vaccines are "not the solution" to the problems the industry faces…"There seems to be a failure to diagnose what the problem is, rather than rushing straight to the solution for airlines and particularly international airlines. So, diagnosing the challenge is essential to solving it, for without diagnosis there can be no cure", he said."
Source: CAPA Centre for Aviation

REVIEW

The Cirium Airline Insights Review 2020

"The first Cirium Airline Insights Review 2020 is live for download and includes The On-Time Performance Review 2020. In this review, we have produced a detailed analysis of aviation and air travel data supported by a very wide data lake – The Cirium Core."
Source: Cirium

The impact of COVID-19 on the airport business

"Airports Council International (ACI) World has published its fifth assessment analysing the economic impact of the COVID-19 pandemic, and its effects on the global airport business."
Source: Airports Council International (ACI) World

Economic Performance of the Airline Industry

"This semi-annual report takes a broad look at how the airline industry is adding value for its consumers, the wider economy and governments, as well as for its investors."
Source: IATA

Disruptive Technologies Drive the Growth of the Global Commercial Air Traffic Management (ATM) Market, 2020

"After the downturn caused by the COVID-19 pandemic, the global commercial air traffic management (ATM) market will witness growth due to the rising adoption of automation and digital technologies, including

moments that captured our imaginations during the dark times. Here are the wildest."
Source: CNN

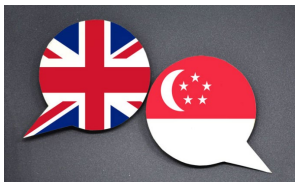
2020 Canceled 21 Years Of Aviation Growth

"Data released by aviation analysis and data business Cirium shows that COVID-19 and its fallout has canceled 21 years of global aviation growth. This year, airlines worldwide operated 49% fewer flights than in 2019, and passenger traffic was down 67% this year. Cirium says just 16.8 million flights operated in 2020, the lowest figure since 1999."
Source: Simply Flying

Updated COVID-19 economic impact analysis published by ACI World

"As a result of the COVID-19 pandemic, updated ACI World analysis has found that airport revenues will experience a total reduction of $111.8 billion in 2020."
Source: International Airport Review

AVIATION INDUSTRY



The Civil Aviation Authority of Singapore and UK Civil Aviation Authority strengthen bilateral partnership

"Both agencies commit to expand cooperation to improve aviation safety and training, cybersecurity in air transport systems and safeguarding of public health in air travel. A second agreement on Technical Arrangement on Aviation Maintenance will streamline audits and reduce regulatory compliance costs for MRO organisations."
Source: International Airport Review

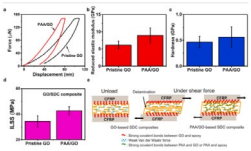
Aviation industry agrees vital slot use relief

"As a result of the collapse in demand from the COVID-19 crisis, some 65% of direct city pair connections vanished in the first quarter of 2020. Slot-regulated airports serve almost half of all passengers and are the backbone of the global scheduled airline network. But recovery is impossible while there is no certainty on the rules governing the use and retention of airport slots."
Source: Airports Council International (ACI) World

Aviation, travel take-off rests on global borders reopening

"With an increasing amount of electrification projects in aviation, reliability becomes a key question. Integrating electric and electronic equipment in areas that have been dominated by thermal machines poses big challenges and opportunities. This presentation provides insights into the methods used to determine the required reliability by assessing the whole system and exploring the electromechanical and environmental interactions that define the new requirements to be met."
Source: Elsevier

AVIATION APPLICATIONS



Graphene oxide thin film structural dielectric capacitors for aviation static electricity harvesting and storage

"In this paper, we demonstrate the feasibility of using carbon fibre reinforced polymer (CFRP) laminates for the dual functions on aircraft as high load-bearing structural materials as well as for the harvesting and storage of static electricity during flight which can be used to power navigation lights and other electrical systems. CFRP laminate was fabricated into a structural dielectric capacitor (SDC) composite by sandwiching graphene oxide (GO) film between two electrically-conductive carbon fabric layers."
Source: Elsevier

Analysis and Maximizing RF Harvesting System based on Antenna Shapes for Aviation Applications

"This paper presents designing and analysis of microstrip patch antenna at 900 MHz frequency for aviation applications. Comparative analysis is presented on the basis of geometry of patch of antenna, rectangular, circular and triangular. Patch is used to compare the results. Inset feed is used due to which proposed antenna achieves size reduction. Antennas are designed on FR4 material with dielectric constant 4.2 and thickness 1.6 mm. The different performance parameters such as return loss, gain and bandwidth of these antennas are compared."
Source: IEEE Xplore

AVIATION FUEL

remote towers, predictive technologies, and artificial intelligence (AI). The growing pressure to handle heavy air traffic is driving air navigation service providers' (ANSP) spending on the overall modernization of ATM infrastructure."
Source: Frost & Sullivan

WHITE PAPER

Safe, cost-efficient contingency operations for airports

"As air traffic volumes continue to rise, many airports are seeking to increase capacity safely and cost-effectively. They must typically also invest in modernisation in order to tackle new challenges such as growing volumes of unmanned aerial vehicle (UAV) traffic. Given these demands on already tight budgets, maintaining effective contingency arrangements can seem like a costly distraction—not least because the conventional approach to contingency is a huge investment in an additional tower, which then cannot handle the full capacity of the main tower or airport operations centre."
Source: Air Traffic Management

INSIGHT

The 2020 edition of the World Civil Aviation Report is now available

"This has been an exceptional year. We recently published the 4th edition of the World Civil Aviation Report, a publication that shares the work we have undertaken to address some of the challenges facing civil aviation today. In 2020 ICAO had to contend with the challenges posed to civil aviation by the COVID-19 pandemic, while at the same time carrying out our regular work programme."
Source: ICAO

Outlook for Air Transport and the Airline Industry

"We assume a vaccine(s) is deployed in the second half of 2021, but it looks likely that there will be production and distribution challenges that mean it will only be in late 2021 and in 2022 when air travel rises back substantially."
Source: IATA

"The news of vaccines being rolled out in major aviation markets is a shot in the arm for Singapore's status as an aviation hub in the long-term, but in the short term the recovery trajectory will remain long and potentially bumpy…"
Source: The Business Times

Government to provide additional S$84 million to aviation sector amid COVID-19 pandemic

"SINGAPORE: The Government will provide an additional S$84 million to the aviation sector to cushion the blow of the COVID-19 pandemic on workers and businesses, the Civil Aviation Authority of Singapore (CAAS) said on Tuesday (Dec 29)."
Source: Channel News Asia

Brexit and aviation: all's well that ends. Well, almost...

"Brexit was never about improving the European aviation system, but there were major concerns that the existing conditions would be seriously eroded. These have mostly been avoided, even if the outcome is less than optimal."
Source: CAPA Centre for Aviation

AIRLINES

Airlines predicted to spend US$2.8 trillion on new aircraft after COVID-19

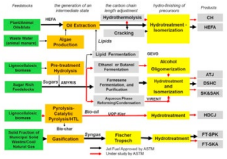
"The 2020 Cirium Fleet Forecast predicts that 43,315 new passenger and freighter aircraft will be delivered between 2020 and 2039. This represents an 8 percent drop compared to the 20 year outlook in the 2019 Cirium Fleet Forecast and includes some 4600 fewer deliveries in the next decade."
Source: Newshub

2020 was brutal for airlines. Next year could be even trickier.

"The airline industry will return — but reshaped, redesigned and ready to meet new challenges."
Source: NBC News

Can Airline Stocks Bounce Back in 2021?

"For now, passengers continue to stay away. Industry revenue is projected to fall more than 65% year over year, and the airlines are missing out on a lot of revenue during the usually high-margin holiday travel season."



Prospects and perspectives foster enhanced research on bio-aviation fuels

"Bio-fuels can indeed mitigate the environmental impact of the aviation sector mostly due to their low carbon intensity and favourable chemical structure. Such bio-aviation fuels must have "drop-in" characteristics with specifications and compatibility with the combustion behaviour of kerosene… In order to reduce the cost of bio-aviation fuel, several research directions are encouraged and discussed in the paper."
Source: Elsevier

Modelling, simulation and intensification of the hydroprocessing of chicken fat to produce renewable aviation fuel

"The conversion process for this raw material has not been economically evaluated, and neither it has been intensified. Therefore, in this work the modelling, simulation and intensification of the hydroprocessing of chicken fat to produce renewable aviation fuel is proposed. For this, conventional hydrotreating processes are modelled and used to define the intensified ones, where complex configurations are used to perform the purification. All processes are compared in terms of economic and environmental indicators."
Source: Elsevier

Energy Transition in Aviation: The Role of Cryogenic Fuels

"Aviation is the backbone of our modern society. In 2019, around 4.5 billion passengers travelled through the air. However, at the same time, aviation was also responsible for around 5% of anthropogenic causes of global warming. The impact of the COVID-19 pandemic on the aviation sector in the short term is clearly very high, but the long-term effects are still unknown... This paper explores some of the various options for energy carriers in aviation and particularly highlights the possibilities and challenges of using cryogenic fuels/energy carriers such as liquid hydrogen (LH2) and liquefied natural gas (LNG)."
Source: MDPI

Power-to-Liquid fuels for aviation – Processes, resources and supply potential under German conditions

A Global Outlook: How COVID-19 Will Change Air Travel

"Most airline professionals agree that the industry will emerge from the COVID-19 outbreak fundamentally altered. Experts identify what changes might be here to stay."
Source: APEX

Annual growth in global air traffic passenger demand from 2006 to 2021

"This statistic represents the annual growth in global air traffic passenger demand between 2006 and 2021. In 2020, due to the coronavirus outbreak, global air traffic passenger decreased by 60.9 percent."
Source: Statista

OECD Policy Responses to Coronavirus (COVID-19): COVID-19 and the aviation industry: Impact and policy responses

"Air transport represents a small share of GDP but is closely linked to the activities of other sectors, especially airports and aircraft manufacturing – collectively considered here as the "aviation industry"… While the aviation industry has often been a target of government policies, the COVID-19 crisis has precipitated a new suite of loans, loan guarantees, wage subsidies and equity injections, raising concerns about competition and the efficient use of public resources."
Source: OECD

Economic Impacts of COVID-19 on Civil Aviation

"In light of the rapidly spreading disease named as COVID-19, the International Civil Aviation Organization (ICAO) actively monitors its economic impacts on civil aviation and regularly publishes updated reports and adjusted forecasts. The latest version can be viewed here and all full reports are available further below."
Source: ICAO

Geopolitical Chaos Disrupts the Global Aircraft Market, 2019–2030

"The global aircraft market saw a year of turmoil in 2019 as the Boeing 737 MAX saga disrupted production from the commercial aircraft perspective. 2020 has dwarfed the woes of the previous year as the COVID-19 pandemic has thrashed through every facet of the sector, showing mercy to few. Most evaluations see the industry as a whole recovering in the years to come."
Source: Frost & Sullivan

Source: The Motley Fool

10 Best Airline Stocks To Buy For 2021

"In this article we analyze the 10 best airline stocks to buy for 2021. Despite huge losses, layoffs and cash burn amid the coronavirus crisis, airline stocks present a solid investment opportunity for those who are willing to wait for the inevitable rebound of the travel industry."
Source: Yahoo! Finance

Airlines to Bring Back Thousands of Workers After Passage of Covid-19 Aid Bill

"Government relief covers carriers' payrolls through March, but rebound in air travel remains uncertain"
Source: Wall Street Journal

Airline alliances support global slot relief measures

"oneworld, SkyTeam and Star Alliance have called for governments to implement recommendations for slot relief measures for northern summer 2021. The call was issued by the Worldwide Airport Slot Board (WASB), comprising Airports Council International (ACI World), IATA, and the Worldwide Airport Coordinators Group (WWACG)."
Source: Breaking Travel News

AIRPORT

DFW introduces cloud based platform for sharing cargo data

"Dallas/Fort Worth International Airport (DFW) has introduced a cloud based data sharing platform for cargo customers that it is confident will ensure "seamless transactions across the supply chain"."
Source: Airport World

Star Alliance launches touchless biometric technology at Frankfurt and Munich hubs

"According to the airline group, the Star Alliance Biometrics platform advances the ability of member airlines to deliver a seamless customer journey, while strengthening loyalty value proposition within its travel ecosystem."
Source: Airport World

Landscape at Auckland International Airport wins US firm architecture award

"This paper addresses the possible contribution of Power-to-Liquid (PtL) kerosene to a more sustainable fuel supply for the aviation sector, using Germany as an example. An overview of the Power-to-Liquid technology and the corresponding provision chains of PtL kerosene is given. Thereby, the resource potential needed to implement such processes under German conditions are presented by discussing relevant sources of sustainable CO2 and the availability of electricity from renewable sources."
Source: Elsevier

Experimental optimisation comparison of detonation characteristics between leaded aviation gasoline low lead and its possible unleaded alternatives

"Federal Aviation Administration's twenty years of research with two-hundred unleaded blends has not found a "drop-in" unleaded replacement for aviation gasoline 100 low lead, a specifically formulated fuel for usage in naturally aspirated aircraft engines and contains tetraethyl lead additive to assist on detonation. Tetraethyl lead emission from piston aircrafts can cause serious health impacts and is a human carcinogenic substance. This research optimised the detonation efficiency of 14 aviation/motor fuels/blends."
Source: Elsevier

Low temperature transformation of lignocellulose derived bioinspired molecules to aviation fuel precursor over magnesium–lanthanum mixed oxide catalyst

"Basic magnesium–lanthanum (Mg–La) mixed oxide materials with tunable interaction between Mg and La oxides were prepared for the low temperature production of green diesel and jet fuel intermediates via aldol condensation reaction. The prepared materials were thoroughly analysedby microscopic and spectroscopic techniques to elucidate its structural properties, including the determination of surface area and basic strengths."
Source: Elsevier

Creation a novel promising technique for producing an unleaded aviation gasoline 100UL

"This present work investigates the creation of a novel promising technique for producing an

Digital Transformation to Drive Growth in the Global Airport Information Technology, 2025

"Airports need to embrace digital transformation to enhance the passenger experience and improve cost efficiencies. This research service will focus on the global airport information technology market across the various…These factors, along with low-latency communication technologies (5G communication) will drive large-scale adoption of Internet of Things (IoT) in airports in the long term. IoT will enable airports to optimally allocate resources, enhance the passenger experience, and reduce operational costs."
Source: Frost & Sullivan

Managing Passenger Traffic Amidst Infrastructure Constraints Is Driving Growth of the Airport Passenger Flow Market

"Regulations focused on passenger data security and integrity will be a challenge for the development and implementation of passenger flow management solutions. Internet of Things technologies will drive market growth, but a concern is that the implementation of sensors on a large scale increases the number of entry points for cyberattacks that could disrupt airport operations."
Source: Frost & Sullivan

SUSTAINABILITY

Aviation Sustainability and the Environment, CAPA 26-Nov-2020

"The World Robotics report shows that Europe is the region with the highest robot density globally, with an average value of 114 units per 10,000 employees in the manufacturing industry. For more facts about robots watch IFR´s video news about Europe in one minute."
Source: CAPA Centre for Aviation

MANUAL

ICAO

Testing and Cross-border Risk Management Measures Manual

"This manual has been prepared by aviation health experts led by the

"US firm Surfacedesign has won an award for its landscape architecture and urban planning for Auckland International Airport in New Zealand. "Because 75% of New Zealand's visitors land in Auckland, airport management wanted to highlight the country's historic land-use practices at and around the terminal," says the San Francisco based company's co-founding partner and Auckland project lead, James Lord."
Source: Airport World

Airport Health Measures Audit Programme

"ACI World has partnered with Bureau Veritas - a world leader in testing, inspection, and certification - to introduce the Airport Health Measures Audit programme, based on the SafeGuard™ standards. Through this partnership, ACI and Bureau Veritas are now able to offer members an onsite audit to cover all airport processes, from management to operations."
Source: Airports Council International (ACI) World

ATCA2020: Belgrade Airport enhances security

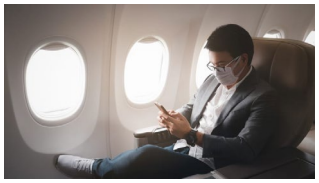
"Over the past few years, the number of drone incidents in the vicinity of airports has increased exponentially. Keeping airports safe from unauthorized unmanned aerial vehicles (UAV) has become a priority for the aviation community."
Source: Air Traffic Management

INTERNATIONAL TRAVEL

How the IATA Travel Pass will work

"The IATA Travel Pass is a bold step forward in the implementation of contactless travel."
Source: International Airport Review

COVID 19 TRAVEL

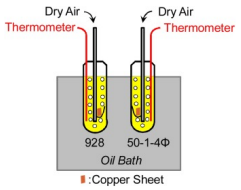


Will business travel return to normal with Covid vaccine? Top executives are split: Survey

"Top technology executives surveyed by CNBC think a significant portion of corporate travel will return, though it may take years, but many CFOs who control company budgets don't see

unleaded aviation gasoline 100UL through studying the influence of various aromatic amines, aromatic hydrocarbons, and MTBE on the antiknock characteristics of model blends of isooctane and n-heptane."
Source: Elsevier

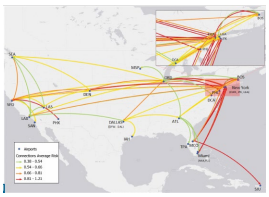
AVIATION LUBRICATION OIL



The intrinsic relationship between color variation and performances of the deteriorated aviation lubrication oil

"Dose the blackened lubrication oil needs to be replaced for flying safety? Since there is very limited room for inaccurate assessment of oil quality due to strict flying safety standards, much aviation lubrication oil is disposed in advance long before their service life. More important, aircrafts still face the fatal challenges from unpredictable lubrication oil deterioration."
Source: Elsevier

AIR NETWORK STRATEGY



Assessing Interdependencies and Congestion Delays in the Aviation Network

"Concerning air traffic delays, air transport networks appear to have variable performance and stochastic nature... Based on data collected from the US Bureau of Transportation Statistics, we analyze how flight delay risk propagates inside the aviation network. In addition, using historic flight performance data we provide predictions for flight chains, which are prone to delays. We implement a tool that can detect the most critical airports and congested connections based on their delay contribution in dependency chains."
Source: IEEE Xplore

The future of Indian aviation from the perspective of environment-centric regulations and policies

"The Indian aviation industry has grown by over 20% annually in the past two years... This article discerns

International Civil Aviation Organization (ICAO) with support from the United States Centers for Disease Control and Prevention, European Centre for Prevention and Disease Control (ECDC) and others, with contributions from the World Health Organization (WHO) as well as aviation medical and health experts from governments and industry. Together they form the Collaborative Arrangement for the Prevention and Management of Public Health Events in Civil Aviation (CAPSCA). CAPSCA brings together international, regional, national, and local organizations to work together to improve preparedness planning and response to public health events that affect the aviation sector."
Source: ICAO

ICAO Model UAS Regulations

"This draft Advisory Circular (AC) provides information for consideration by States to assist them with UAS regulations under development in setting standards for the manufacturer's Declaration of Compliance (DOC). While this draft AC is specific to RPAS advanced operations in Canada, this material can be studied by States to assist in the development of their State's individual Safety Assurance standards for manufacturers."
Source: ICAO

business travel ever returning to the pre-pandemic level.
Bill Gates recently said he thinks 50% of business travel will disappear."
Source: CNBC

Mandatory Covid-19 Vaccines for Travel Would 'Kill the Sector'

"The rollout of vaccines against Covid-19 has intensified debate about whether they should be made mandatory, with the head of a major tourism lobby saying that doing so would cause irreparable harm to the struggling sector."
Source: Bloomberg

Airports reject vaccine requirement as travel debate intensifies

"Airports Council International, which represents airports worldwide, joined most airlines in calling for a choice between testing or vaccination, fearing a blanket rule imposing pre-flight inoculation would be as disruptive as quarantines."
Source: The Star

More parcels, fewer people: how aviation is adapting to COVID-19

"Airline firms are rushing to convert passenger jets into freighters, as the value of used planes tumbles amid the pandemic. It's expected the number of passenger-to-freight conversions globally will rise by 36% in 2021."
Source: World Economic Forum

PRIVATE AVIATION

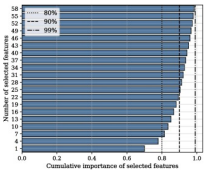
Can't make Courchevel this year? How about a private jet to the Caribbean?

"Those who usually hop a commercial flight to spend Christmas in the Alps might be swapping their skis for a snorkelling kit this year — and choosing to fly privately to more balmy climes."
Source: Financial News London

2021 Private Jet Predictions

"Yes, it is that time of the year. Just weeks away separate us from 2021 and, as every year, Kyle Patel, CEO of Palm Beach-based private jet provider BitLux, shares his projections for next year's business aviation industry. The 2020 trend for this segment was adapting and remaining flexible to the challenges imposed by the pandemic, with the possible implications that such an environmental policy can have on the Indian aviation sector by modelling the impact of a prospective carbon tax on the domestic aviation sector."
Source: IIMB Management Review

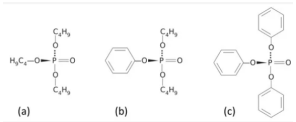
AIRCRAFT LANDING PERFORMANCE



Towards online prediction of safety-critical landing metrics in aviation using supervised machine learning

"In this work, a novel offline-online framework is developed for building a global predictive model offline to predict landing performance metrics online. The framework leverages flight data from the approach phase between certain approach altitudes (also called gates) in order to train the offline model to predict the landing true airspeed and ground speed using a Random Forest regression algorithm."
Source: ELSEVIER

OPTO-CHEMICAL SENSOR TECHNOLOGIES



Health Monitoring of Aviation Hydraulic Fluids Using Opto-Chemical Sensor Technologies

"Passenger safety requires that in commercial airplanes hydraulic actuators be powered by fire-resistant hydraulic fluids. As a downside, such fluids are hygroscopic which means that these tend to accumulate humidity from the environment and that the dissolved humidity tends to produce acidity which can corrode all kinds of metallic components inside a hydraulic system. As such damage in safety-critical subsystems is hard to localize and expensive to repair, sensor technologies are required which allow the state of water contamination and fluid degradation to be routinely checked and necessary maintenance actions to be scheduled in a way that causes minimum flight interruptions. The paper reviews progress that has been made in developing such sensor systems and in commissioning these into practical flight operation."
Source: MDPI

diversification of services being one the key elements. What will define 2021 for the business aviation market?"
Source: Luxury Travel Magazine

JetASAP Launches Free, Self-Service Private Jet Travel App

"The executive team at JetASAP™ has launched its innovative, self-service, invitation-only mobile app. One push of a button allows travelers to submit their confidential trip request immediately to 700+ charter operators nationwide, and ARGUS and Wyvern safety ratings are automatically retrieved and displayed alongside each operator's quote."
Source: Luxury Travel Magazine

Private Jet Industry Trends Upwards Due to Covid-19 Pandemic

"While the Covid-19 pandemic has had a huge impact on the commercial airline industry, the trends in the private jet industry actually show comparatively positive effects."
Source: Elite Traveler

Covid-19: is private aviation past the turbulence?

"If the private jet industry has been able to withstand the unfavourable coronavirus winds, the private aviation resale market is struggling to take off."
Source: Monaco Tribune

Private aviation thrived in 2020 despite it being the worst time to travel in the modern era — here's a look at its wild year

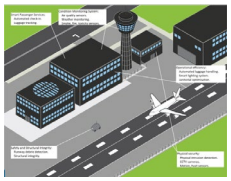
"The private aviation industry went from virtually no flights at the peak of the pandemic to thriving by year's end. Aircraft manufacturers kept producing new models and even teamed up with the auto industry to offer some expensive package deals for unique pairings."
Source: Business Insider

SUSTAINABLE AVIATION TRAVEL

IATA calls on governments worldwide to support Sustainable Aviation Fuel

"Currently SAF is on average between two to four times more expensive than fossil fuels with current global production of about 100 million litres a year which is just 0.1 per cent

CYBERSECURITY



A Holistic Review of Cybersecurity and Reliability Perspectives in Smart Airports

"In this study, we present a holistic review of existing smart airport applications and services enabled by IoT sensors and systems. Additionally, we investigate several types of cyber defence tools including AI and data mining techniques, and analyse their strengths and weaknesses in the context of smart airports. Furthermore, we provide a classification of smart airport sub-systems based on their purpose and criticality and address cyber threats that can affect the security of smart airport's networks."
Source: IEEE Xplore

Intelligent Cyber Defense in 5G Augmented Aviation Cybersecurity Framework

"The fifth-generation mobile network (5G) is replacing the 4G LTE hardware and communication infrastructure in connecting aviation echo system, infrastructure, and technologies. The wireless connectivity upgrade promises to make data network faster expanding the aviation technological scope. 5G augmented Internet of Things (IoT), Augmented Reality (AR) and Virtual Reality (VR) provides new dimensions to integrated digital technologies. The high reliability and low latency of 5G absorption is advantageous for digital aviation. In this project we explore the cyber challenges associated with 5G and ways to mitigate the risk."
Source: Aerospace Research Central

MACHINE LEARNING

Predicting Adverse Events and their Precursors in Aviation Using Multi-Class Multiple-Instance Learning

"This work proposes using the multiple-instance learning (MIL) framework, a weakly supervised learning task, combined with carefully designed binary classifiers leveraging a Multi-Head Convolutional Neural Networks-Recurrent Neural Networks (MHCNN-RNN) architecture. The classifiers are then combined to perform a multi-class task, which enables the

of the total amount of aviation fuel consumed by the industry."
Source: International Airport Review

Sustainable aviation fuel: A journey to greener skies

"About 15 years ago, Finnish energy company Neste decided to change its course. Since 1948, Neste was in the oil business, but the health of the planet and future generations began to weigh on the company's leadership."
Source: Green Biz

Can Shell help pilot a new era of sustainable aviation?

"One of the world's largest oil and gas companies is betting that the future of flying is carbon-neutral. That may seem an audacious notion from a company whose business model for well over a century has centered around bringing fossil fuels to market…"
Source: Green Biz

Could sustainable fuel derived from cooking oil help aviation navigate to a cleaner future?

"While the aviation industry has committed to achieving carbon neutral growth from this year and a 50 per cent reduction in net CO2 by 2050, more ambitious targets are needed."
Source: Channel News Asia

UAE's nascent path to sustainable aviation fuel use seen pockmarked with hurdles

"The UAE aviation industry, the world's sixth biggest CO2 polluter, is making headway in developing and using sustainable aviation fuel, or SAF, in flights as part of efforts to lower emissions but its goals may not be attainable, given the infancy of the non-conventional commodity."
Source: S&P Global

ATM

New partnership created to drive the modernisation of European ATM

"An innovative partnership of leading airspace users, airports, air navigation service providers and the EUROCONTROL Network Manager (NM) have jointly released a set of high-level principles to drive and effectively coordinate the modernisation of the European air traffic management (ATM) system over the coming years."

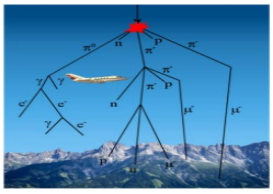
prediction of different adverse events for any given flight and the identification of their precursors with minimum post-processing. Results obtained show that the MHCNN-RNN is able to accurately forecast high speed and high path angle events during the approach, and that it is also capable of determining the aircraft's parameters that are correlated to these events."
Source: Aerospace Research Central

FATIGUE MANAGEMENT

The Importance of Validating Sleep Behavior Models for Fatigue Management Software in Military Aviation

"The goal of the study was to validate the sleep behavior model settings for a fatigue modeling tool that is used within the RCAF, the Fatigue Avoidance Scheduling Tool, taking into account the organizational requirements for pre- and postflight routines, especially within the Air Mobility force."
Source: Oxford Academic Military Medicine

HEALTH AND SAFETY



Radiation in the Atmosphere—A Hazard to Aviation Safety?

"Exposure of aircrew to cosmic radiation has been recognized as an occupational health risk for several decades. This article gives an overview of the different generally recognized sources due to weather as well as space weather phenomena that contribute to radiation exposure in the atmosphere and the associated radiation effects that might pose a risk to aviation safety at large, including effects on human health and avionics."
Source: MDPI

The Study of Aviation Safe Incapacitating Device Based on LED Technology with a Smart-Illumination Sensor Unit

"This paper deals with a design and implementation of optical defensive device for protection of aviation personnel. The design is built on the basic characteristics of human eyesight, illumination sensing of the environment, and microcontroller

Source: International Airport Review

UAS

Russia developing technology to integrate drones into common airspace

"On December 21, 2020 the technical design stage of the Russian Unmanned aircraft system Traffic Management (RUTM1) was completed and the project team demonstrated the UAV's onboard module and the operability of various services for UAV, including the service for automatic conflict resolution in real time."
Source: Air Traffic Management

UTM

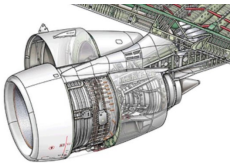
Pop-Up Unmanned Traffic Management Successfully Demonstrated

"Altitude Angel, Unmanned Traffic Management (UTM) technology provider, Inmarsat, global mobile satellite communications, and A-techSYN, manufacturer of next generation Unmanned Aerial Vehicles (UAVs), have announced the successful conclusion of drone test flights using their jointly developed Pop-Up UTM platform."
Source: Air Traffic Management

Innov'ATM deploys UTM system in busiest European controlled airspace

"The World Robotics report shows that Europe is the region with the highest robot density globally, with an average value of 114 units per 10,000 employees in the manufacturing industry. For more facts about robots watch IFR´s video news about Europe in one minute."
Source: Air Traffic Management

AIR SAFETY



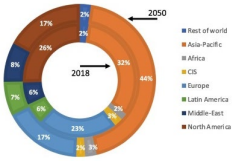
EASA embarks on comprehensive project to examine cabin-air toxicity risk

implementation for adaptation over sensed power, flash duration, and person distance. The aviation safe LED-based optical dazzler equipment (ASLODE) utilizes light emitting diode (LED) technology implemented with constant current regulators to control several modes of effects based on situational sensing."
Source: MDPI

Research Overview of Aviation Safety Risk Assessment

"Safety risk assessment is the most important and difficult key link in the implementation of aviation safety management. In order to understand the development status and advanced technology of aviation safety risk assessment, this paper analyzes the main contents of aviation safety risk assessment. Based on the summary of the relevant research status at home and abroad, the paper focuses on the research and application of risk assessment in the field of aviation safety from two aspects: the index system and risk assessment method of aviation safety."
Source: Atlantis Press

SUSTAINABILITY



The global scale, distribution and growth of aviation: Implications for climate change

"Prior to the COVID-19 crisis, global air transport demand was expected to triple between 2020 and 2050…Data also supports that a minor share of air travelers is responsible for a large share of warming... Individual users of private aircraft can contribute to emissions of up to 7,500 t CO2 per year. Findings are specifically relevant with regard to the insight that a large share of global aviation emissions is not covered by policy agreements."
Source: Elsevier

Use of aviation by climate change researchers: Structural influences, personal attitudes, and information provision

"For climate change researchers, work-related travel – including for conferences and fieldwork – is a major carbon-emitting activity. At the same time, many argue that climate scientists have an important role in curbing their own aviation emissions to align their practices with their assertions in relation to emissions reduction. We examine the tensions

"The three-year project – being put out to tender by the European Union Aviation Safety Agency – will also gather evidence of their effects on cabin air quality, and develop an understanding of different contamination scenarios which might be observed during flight."
Source: Flight Global

Aviation deaths rise worldwide in 2020 even as fatal incidents, flights fall

"Aviation consulting firm To70 said in 2020 there were 40 accidents involving large commercial passenger planes, five of which were fatal, resulting in 299 fatalities. In 2019 there were 86 accidents, eight of which were fatal, resulting in 257 fatalities."
Source: Channel News Asia

between competing professional demands in relation to flying; measure levels of flying by climate and non-climate researchers; assess influences on choices and attitudes; and consider how information provision and structural changes might enable changes in practice."
Source: Elsevier

From aviation to aviation: Environmental and financial viability of closed-loop recycling of carbon fibre composite

"In this study, aircraft interior applications of recycled carbon fibre (rCF) replacing virgin glass fibre are examined over the full life cycle in terms of environmental and financial viability. The viability of rCF for closed-loop aviation applications are demonstrated across rCF conversion (papermaking; fibre alignment) and composite manufacture (compression moulding; injection moulding)."
Source: Elsevier

Risk Assessment Regarding Perceived Toxicity and Acceptance of Carbon Dioxide-Based Fuel by Laypeople for Its Use in Road Traffic and Aviation

"One approach to mitigate the emissions of carbon dioxide (CO2) is the development of CO2-based products, such as fuels for road traffic and aviation… For both aviation and road traffic the acceptance of CO2-based fuels increased with decreasing fear of health and environmental consequences and the less frequently health effects were assessed. The findings allow to derive implications for risk assessment and communication strategies in the development and roll-out of CO2-based fuels."
Source: Frontiers in Energy Research

Cleaner production of flame-retardant-glass reinforced epoxy resin composite for aviation and reducing smoke toxicity

"The flame-retardant glass fiber reinforced epoxy composites have been examined for the aviation and defense industry recently…This study demonstrated the holistic cleaner production approach that did not ignore the environment and human health effects of fire risk and hazards on, and could be apply for the all polymer composite requiring thermal resistance, first time in the literature."
Source: Elsevier

Sensitivity Analysis of Aviation Environmental Impacts for the Base of Aircraft Data (BADA) Family 4

"In this paper we present the first stage of the uncertainty quantification effort on BADA4. First, the uncertainty characterization step identifies and mathematically representing the uncertain parameters, including BADA4 model coefficients and physical/operational parameters. Subsequently, a sensitivity analysis quantifies the impacts of physical/operational uncertainties on key AEDT outputs. Through the result analysis, it is found out that the physical and operational uncertainties have significant impact on the estimation of key environmental metrics."

Source: Aerospace Research Central

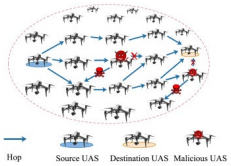
WOMEN IN AVIATION

Women in Aviation: A Phenomenological Study Exploring the Needs and Wants Necessary for Graduation

"The World Robotics report shows that Europe is the region with the highest robot density globally, with an average value of 114 units per 10,000 employees in the manufacturing industry. For more facts about robots watch IFR´s video news about Europe in one minute."

Source: Embry-Riddle Aeronautical University

UAS



Lightweight blockchain assisted secure routing of swarm UAS networking

"In this paper, we propose a lightweight Blockchain-based secure routing algorithm for swarm UAS networking. We leverage the lightweight Blockchain to enhance the security of routing of swarm UAS networking which is based on 5G NR cellular networking. Different from the conventional routing algorithms, the proposed algorithm with lightweight Blockchain can avoid the malicious connections from attackers, recognize the malicious UASs and mitigate the attacks from malicious UASs."

Source: Elsevier

Beamforming-Constrained Swarm UAS Networking Routing

"With the evolution of 5G cellular communication, beamforming is mature for the implementation on a large scale… In this paper, regarding the constrained steering space, we proposed a novel algorithm, Optimized Ad-hoc On-demand Distance Vector (OAODV),which aims to improve the capacity of beamforming on swarm UAS networking. With the adjustable searching space, OAODV can achieve better latency, overhead, and link generation than the conventional algorithms of Ad-hoc On-demand Distance Vector (AODV) and Optimized Link State Routing (OLSR). Compared with AODV and OLSR, OAODV can reduce 35.07% and 68.93%of average overhead, and decrease 47.73% and 11.55%of average latency respectively."

Source: IEEE Xplore