

TOPICAL REPORT

AVIATION

Gain insight and keep up-to-date with the latest publications carefully selected by the library from credible sources in academic publications, industry & market research and scientific & industry news.

If you have any sources to suggest for our report please [let us know](#).

[view past reports](#)

[subscribe to others](#)

[unsubscribe](#)

news

academic

reports

AIRPORTS



Rapid urbanization, air transport demand, and land scarcity: Where will the industry build new airports?

"According to the United Nation's Department of Economic and Social Affairs, in its 2018 Revision of World Urbanization Prospects, the number of megacities has tripled since 1990; by 2030, 43 urban agglomerations are projected to house at least 10 million inhabitants each. The megacity trend has major implications for airport systems and transport infrastructure."

Source: ACI Insights

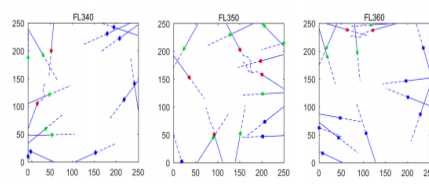
Five technology trends to shape the airport of the future

"Technology provider Amadeus took a look at the future of airports — the gateways to the world as the company called them — to discern the trends that will affect the airports and the millions of passengers that pass through the doors on their way to somewhere else. Amadeus spoke to five leaders in the industry to hear what they had to say."

Source: Asian Aviation Magazine

Innovative infrastructure: how technology is changing airport construction

AIR TRAFFIC MANAGEMENT



Enhanced Conflict Resolution Maneuvers for Dense Airspaces

"This work presents a comprehensive algorithm for potential en-route conflict resolutions that could be conducted with both constant as well as variable altitudes. The resulting trajectories are expected to be near-optimal in the sense that they consider geometrically minimum deviation from the original aircraft flight-path."

Source: IEEE Transactions on Aerospace and Electronic Systems

Quantum Annealing Applied to De-Conflicting Optimal Trajectories for Air Traffic Management

"We present the mapping of a class of simplified air traffic management problems (strategic conflict resolution) to quadratic unconstrained Boolean optimization problems. The mapping is performed through an original representation of the conflict-resolution problem in terms of a conflict graph, where the nodes of the graph represent flights and the edges represent a potential conflict between flights ..."

Source: IEEE Transactions on Intelligent Transportation Systems

ECONOMIC DEVELOPMENT & IMPACT



State of the region: Asia Pacific

Economy

GDP growth, selected countries

	2015	Q1 2016	Q2 2016	Q3 2016
Japan	0.4	0.0	0.0	0.0
China	6.9	6.9	6.9	6.9
Indonesia	5.2	5.1	5.1	5.0
Korea	2.7	1.6	2.1	2.0
Australia	2.7	1.7	1.6	1.7
Thailand	4.1	2.8	2.3	2.4
Malaysia	4.1	4.0	4.0	4.0
India	7.3	7.3	7.3	7.3

Exchange rates

January 2020

Business confidence - manufacturing PMI



Regional Economic Briefing: Asia-Pacific (January 2020)

A holistic overview of the economic, market, and industry performance of the aviation sector in Asia-Pacific regions in January 2020.

Source: International Air Transport Association

DEC 2019: Air Transport Monthly Monitor

ICAO produces an Air Transport Monthly Monitor that provides a snapshot and analysis of economic and aviation indicators, including passenger traffic, capacity, freight traffic, top airports and airline groups.

Source: International Civil Aviation Organization

JAN 2020: Air Transport Monthly Monitor

ICAO produces an Air Transport Monthly Monitor that provides a snapshot and analysis of economic and aviation indicators, including passenger traffic, capacity, freight traffic, top airports and airline groups.

Source: International Civil Aviation Organization

Aviation Benefits Report 2019 Edition

"Aviation is one of the most 'global' industries: connecting people, cultures and businesses across

"From component tracking systems to building information modelling, airports are increasingly turning to new technologies to facilitate the construction of major projects. Here is a look at five case studies."

Source: Airport Technology

SMART AIRPORT



What smart airports of the future will be like: air taxis, 5G, sensor corridors for fuss-free security and much more

"We are headed for an era where e-gates and facial recognition will evolve into biometrics and AI to allow infrastructure to 'think' for itself. Automated checkpoints and sensor corridors will make going through security fuss-free, while there may even be air taxis to take us to and from the airport."

Source: South China Morning Post

CITIES



Airbus and CAAS sign MoU to bring urban air mobility in Singapore

"Aerospace company Airbus and the Civil Aviation Authority of Singapore (CAAS) have partnered to introduce urban air mobility (UAM) in Singapore."

Source: Aerospace Technology

TECHNOLOGY & INNOVATION



Bring on the show

"In addition to some new technology powering the 2020 edition of the Singapore Airshow in the form of solar panels, other technologies like 3D printing and sustainable fuels will on display. Editor Matt Driskill previews the show."

Source: Asian Aviation Magazine

CYBERSECURITY

Route-Based Dynamics Modeling and Tracking With Application to Air Traffic Surveillance

"This paper is concerned with the route-based dynamic modeling along with the route-aided tracking ..."

Source: IEEE Transactions on Intelligent Transportation Systems

Airport Delay Prediction Based on Spatiotemporal Analysis and Bi-LSTM Sequence Learning

"This paper proposes a multi-step deep sequence learning model (Bi-LSTM+Seq2Seq) to predict airport delay which considers the spatial-temporal correlation of other airports in the network."

Source: 2019 Chinese Automation Congress (CAC)

IP-based Space Air Ground Information Network for Air Traffic Control Communication

"This paper highlights the limitations and challenges of existing technologies of air traffic communication and issues of independent Communication Navigation and Surveillance (CNS)."

Source: 2019 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM)

Decentralizing Air Traffic Flow Management with Blockchain-based Reinforcement Learning

"We propose and implement a decentralized, intelligent air traffic flow management (ATFM) solution to improve the efficiency of air transportation in the ASEAN region as a whole. Our system, named BlockAgent, leverages the inherent synergy between multi-agent reinforcement learning (RL) for air traffic flow optimization; and the rising blockchain technology for a secure, transparent and decentralized coordination platform."

Source: 2019 IEEE 17th International Conference on Industrial Informatics (INDIN)

A cascaded three-look network for aircraft detection in SAR images

"Aircraft detection in synthetic aperture radar (SAR) images is a tough problem in remote sensing image interpretation, due to different scattering characteristics and scales of aircrafts as well as the influences of airport metal objects. Although deep convolutional neural networks perform well in object detection on optical images, the application of deep learning for SAR image aircraft

continents. Colleagues throughout the sector are committed to raising awareness of the benefits and the role of aviation. The IHLG organizations have collaborated to provide a comprehensive view of the importance of aviation in supporting the global economy and generating social benefits through the prism of sustainable air transport solutions. It is necessary for all stakeholders and partners to work together to maximize the benefits of air transport, and to support the sustainable growth of aviation by connecting more people and more places, more often."

Source: International Civil Aviation Organization



Airport Security Concern As 97% Of World's Top 100 Fail Cybersecurity Test

"When it comes to cybersecurity, 97 of the world's largest 100 airports failed to pass the tests set by one leading web security business. Given that the World Economic Forum (WEF) had flagged emerging cybersecurity challenges facing the aviation industry during its 2020 annual meeting in Davos-Klosters, the timing of this research couldn't be better, or should that be worse?"

Source: Forbes

OUTLOOK



The year ahead

"This past year in aviation was tough on many fronts for many sectors. Airlines like Cathay Pacific were caught up in anti-government protests (as was Hong Kong International Airport) and manufacturers like Boeing, Rolls-Royce and Pratt & Whitney all faced product problems. Editor Matt Driskill looks at the year to come."

Source: Asian Aviation Magazine

detection has not been adequately studied. In this article, a cascaded three-look network is proposed to locate aircrafts in SAR images."

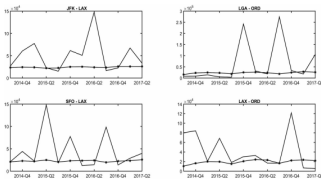
Source: Remote Sensing Letters

Influence of airport airside area layouts and air traffic management tactics on flight cost efficiency

"This paper deals with an investigation of the influence of different airport airside area layouts/configurations and Air Traffic Management (ATM) tactics on flight efficiency in terms of time and costs."

Source: Transportation Planning and Technology

AIR TRANSPORT NETWORK

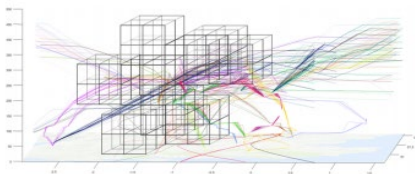


SARIMA damp trend grey forecasting model for airline industry

"The aim of this paper is to propose a new model that improves the Damp Trend Grey Model (DTGM) with a dynamic seasonal damping factor to forecast routes passengers demand (pax) in the air transportation industry. The model is called the SARIMA Damp Trend Grey Forecasting Model (SDTGM)."

Source: Journal of Air Transport Management

AIRPORT NETWORK

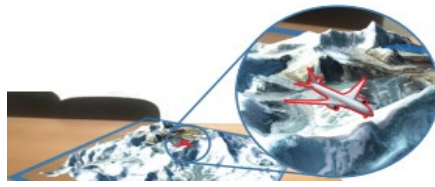


STAM-based methodology to prevent concurrence events in a Multi-Airport System (MAS)

"This paper introduces a rolling horizon methodology for detecting concurrence events, analysing their trajectory interdependencies and applying a strategic mitigation measure that shifts the Estimated Take-Off Time (ETOT) within the assigned Calculated Take-Off Time (CTOT) window."

Source: Transportation Research Part C: Emerging Technologies

AIRSPACE MODERNIZATION



Use of Virtual and Augmented Reality in Design of Software for Airspace

"The aim of the article is to present a software design for the design and adaptation of flight routes and spaces, or respectively, of the Air Traffic Control sectors. Presented system uses the means of virtual and augmented reality."

Source: 2019 International Conference on Military Technologies (ICMT)

SUSTAINABILITY



Source: Britannica ImageQuest

The current impact of aviation performance on carbon dioxide production

"In our paper, we aggregated data on transport performance and the impact of aviation on CO₂ production over 15 years and analyzed them."

Source: 2019 Modern Safety Technologies in Transportation (MOSATT)

Sustainability of the Air Cargo Handling Process in the Context of Safety and Environmental Aspects

"The objective of research presented in this paper is Air Cargo Handling Process (ACHP) and its complex structure but in the context of safety and sustainability. Using of several scientific methods of cognition, the authors research the structure of ACHP and safety, and ecological aspects of the process, too."

Source: Journal of Advanced Transportation