International Journal of Environmental Research and Public Health
Submit to this Journal
Review for this Journal
Edit a Special Issue

Open Access Article

Assessing the Contribution of Data Mining Methods to Avoid Aircraft Run-Off from the Runway to Increase the Safety and Reduce the Negative Environmental Impacts

by Olga Vorobyeva [1,2], Juraj Bartok [1], Peter Šišan [1], Pavol Nechaj [1,2,*], Martin Gera [2], Miroslav Kelemen [3], Volodymyr Polishchuk [4] and Ladislav Gaál [1]

[1] MicroStep-MIS, Čavojského 1, 841 04 Bratislava, Slovakia
[2] Department of Astronomy, Physics of the Earth, and Meteorology, Comenius University in Bratislava, Mlynská dolina 4, 842 48 Bratislava, Slovakia
[3] Faculty of Aeronautics, Technical University of Košice, Rampová 7, 041 21 Košice, Slovakia
[4] Faculty of Information Technologies, Uzhhorod National University, Narodna Square, 3, 88000 Uzhhorod, Ukraine
* Author to whom correspondence should be addressed.

Int. J. Environ. Res. Public Health **2020**, *17*(3), 796; https://doi.org/10.3390/ijerph17030796

Received: 29 November 2019 / Revised: 14 January 2020 / Accepted: 23 January 2020 / Published: 28 January 2020

(This article belongs to the Special Issue Environmental Issues in Aerospace and their Impact on Public Health)

View Full-Text Download PDF Browse Figures Cite This Paper

Abstract

The Single Europe Sky Air Traffic Management Research (SESAR) program develops and implements innovative technological and operational solutions to modernize European air traffic management and to eliminate the negative environmental impacts of aviation activity. This article presents our developments within the SESAR Solution "Safety Support Tools for Avoiding Runway Excursions". This SESAR Solution aims to mitigate the risk of runway excursion, to optimize airport operation management by decreasing the number of runway inspections, to make chemical treatment effective with respect to the environment, and to increase resilience, efficiency and safety in adverse weather situations. The proposed approach is based on the enhancement of runway surface condition awareness by integrating data from various sources. Dangerous windy conditions based on Lidar measurements are also discussed as another relevant factor in relation to runway excursions. The paper aims to explore four different data mining methods to obtain runway conditions from the available input data sources, examines their performance and discusses their pros and cons in comparison with a rule-based algorithm approach. The output of the SESAR Solution is developed in compliance with the new Global Reporting Format of the International Civil Aviation Organization for runway condition description to be valid from 2020. This standard is expected to provide concerned stakeholders with more precise information to enhance flight safety and environmental protection. View Full-Text

Keywords: SESAR; safety; runway excursion; runway surface condition; data mining methods

▼ Show Figures

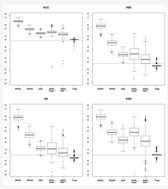


Figure 1

Share and Cite

MDPI and ACS Style

Vorobyeva, O.; Bartok, J.; Šišan, P.; Nechaj, P.; Gera, M.; Kelemen, M.; Polishchuk, V.; Gaál, L. Assessing the Contribution of Data Mining Methods to Avoid Aircraft Run-Off from the Runway to Increase the Safety and Reduce the Negative Environmental Impacts. *Int. J. Environ. Res. Public Health* **2020**, *17*, 796.

Show more citation formats

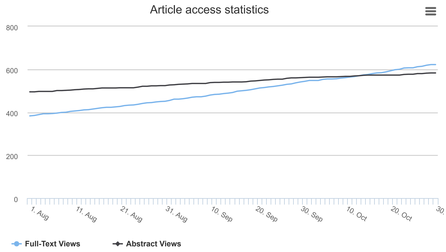
Note that from the first issue of 2016, MDPI journals use article numbers instead of page numbers. See further details here.

Article Metrics

Citations

Crossref	Scopus	Web of Science	Google Scholar
2	2	1	[click to view]

Article Access Statistics



For more information on the journal statistics, click here.

Multiple requests from the same IP address are counted as one view.

Related Articles

Collaborative Solutions for Interference Management in GNSS-Based Aircraft Navigation
Mario Nicola et al., Sensors, 2020

Improving Aviation Safety through Modeling Accident Risk Assessment of Runway
Yaser Yousefi et al., Int J Environ Res Public Health

Impact of Trajectories' Uncertainty in Existing ATC Complexity Methodologies and Metrics for DAC and FCA SESAR Concepts
Gomez Comendador et al., Energies, 2019

The Public Safety Zones around Small and Medium Airports
Di Mascio et al., Aerospace, 2018

A survey of model predictive control methods for traffic signal control
Bao-Lin Ye et al., IEEE/CAA Journal of Automatica Sinica, 2019

The merits of ISO 26000 for CSR development in the mining industry: a case study in the Zambian Copperbelt
Helena Ranängen et al., Social Responsibility Journal, 2014

A survey of model predictive control methods for traffic signal control
Bao-Lin Ye et al., IEEE/CAA Journal of Automatica Sinica, 2019

Fungal statin pump protein improves monacolin J efflux and regulates its production in Komagataella phaffii
Chenxiao Bai et al., Bioresources and Bioprocessing, 2020

Search more from Scilit
SESAR; safety; runway excursion; runway surface condition; data mining methods
Search