

Guest Editorial

Special issue: Selected papers from the Innovative Research Workshop 2010

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Over nearly 10 years the Innovative Research Workshop and Exhibition held annually in early December at the EUROCONTROL Experimental Centre in Brétigny-sur-Orge, France, has brought together researchers and practitioners from air traffic management and related areas. The workshop focused specifically on innovative research and has continuously attracted inspiring new ideas, studies and concepts.

The 2010 edition of the INO Workshop was a notable event (not least because snow kept the attendants locked into the centre one evening) and we have decided to dedicate a special edition of the Journal of Aerospace Operations to it. We have selected what we believe are the most interesting and innovative amongst the papers submitted for presentation at the conference and invited the authors to prepare an extended version of their original manuscript. There are seven articles in this edition which we are sure the reader will find stimulating and rewarding.

“A quantitative exploration of flight prioritisation principles, using new delay costs” by Andrew Cook and Graham Tanner proposes a systematic approach to assessing the cost of delays for airlines and how these findings should be applied to flight prioritisation procedures instead of the simple application of delay minutes for optimisation purposes.

“Analysis of the ecological and economic impact of a Single European Sky by simulating Freeflight trajectories with Lido/Flight” by Andreas Henn, Urban Weißhaar and Philipp Böck proposes a method for quantifying the fuel saving potential of user preferred trajectories as compared to the present trajectories in the European airspace. The application of the flight planning software presently used by Lufthansa and several other airlines to a historic data set shows a fuel saving potential of more than 3% which translates to economic and ecological benefits alike.

“4D trajectory management using Contract of Objectives” by Sandrine Guibert and Laurent Guichard describes a series of experiments carried out in order to assess the benefits and usability of the

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Contract of Objectives concept developed in the CATS project and specifically the concept of Target Windows.

“Contingency Plans for Air Traffic Flow and Capacity Management using Constraint Programming” by Karl Sundequist Blomdahl, Pierre Flener and Justin Pearson introduces a constraint programming-based local search heuristic in order to generate air traffic contingency plans. Such plans are generated, presently by hand, as fallback plans in order to cater for total or substantial system failure. The algorithm proposed is able to generate contingency plans automatically, potentially saving many man hours of expert time.

“Addressing Stakeholders Coordination for Airport Efficiency and Decision-support Requirements” by Gabriel Pestana, Isabel Rebelo, Nuno Duarte and Sylvie Couronné discusses the use of location-based technologies to improve turn-around operations at airports and analyses and compares the findings of three research projects concerned with location-based technologies, namely SPADE, LocON and AAS.

“Air traffic complexity in future Air Traffic Management systems” by Maria Prandini, Vamsi Putta and Jianghai Hu introduces a probabilistic air traffic complexity metric developed within the framework of the iFly project. This new metric incorporates uncertainty affecting the future position of aircraft thus enhancing onboard conflict detection and resolution.

The final article “The SKY-Scanner Time-Critical Decision Support System for Surveillance and Risk Evaluation during Landing and Take-Off” by Kristina Lapin, Vytautas Čyras and Laura Savičienė describes an evaluation of a Light Detection and Ranging radar system (LIDAR) performed in the context of the SKY-Scanners project, more specifically the visualization of LIDAR information on an auxiliary display used by controllers in the approach phase.

We believe these articles will give you a flavour of some of the research projects presently ongoing in Air Traffic Management and we wish you a pleasant read.