

2008 IEEE/AIAA 27th Digital Avionics Systems Conference

(DASC)

**St. Paul, Minnesota, USA
26 – 30 October 2008**

Pages 1-642



**IEEE Catalog Number: CFP08DAV-PRT
ISBN: 978-1-4244-2207-4**

TABLE OF CONTENTS

Aspects on "Architecture for Independent Distributed Avionics" (AIDA)	1
<i>Rodrigo Matos De Azeredo Coutinho</i>	
Design Considerations for Systems Hosted on Integrated Modular Avionics Platforms	10
<i>Christopher B. Watkins, Randy Walter</i>	
Modular Avionics for Seamless Reconfigurable UAS Missions	17
<i>Juan Lopez Rubio, Pablo Royo, Cristina Barrado, Enric Pastor</i>	
Future Integrated Modular Avionics for Jet Fighter Mission Computers	27
<i>Brian Sutterfield, John A. Hoschette, Paul Anton</i>	
ARINC 653 and IMA-Compliant High Robustness File Systems	38
<i>David Kleidermacher, Mike Wolf</i>	
System Considerations for Robust Time and Space Partitioning in Integrated Modular Avionics	43
<i>Justin Littlefield-lawwill, Larry Kinnan</i>	
IMA Resource Allocation Process	54
<i>Dan Mazuk</i>	
Streamlining IMA Integration Through Model-Driven Methodologies	60
<i>Todd Schavey, Shane Duba</i>	
Aircraft Level Optimization of Avionics Architectures	65
<i>Horst Salzwedel</i>	
Management of Configuration Data in an IMA System	72
<i>George Romanski</i>	
Open IMA Development – How Each Role Can Help the Others	82
<i>Jay Pruiett, Jeff Vandorp, Randy Walter</i>	
Security Challenges in UAV Development	88
<i>Paul Parkinson, Chris Constantinides</i>	
The MILS Component Integration Approach to Secure Information Sharing	96
<i>Carolyn Boettcher, Raytheon, Rance Delong, John Rushby</i>	
MILS Virtualization for Integrated Modular Avionics	110
<i>Mike Wolf, David Kleidermacher</i>	
Composition of Information Assurance Properties in Integrated Modular Avionics Systems	118
<i>Dave Pierce, Justin Littlefield</i>	
Networking Concepts Comparison for Avionics Architecture	130
<i>Teresa Schuster, D. Verma</i>	
Integration and Management of Dynamic Systems	141
<i>Michael Mcgrady</i>	
A Low-Cost Modular Avionics and Telemetry Software System for the CReSIS Meridian Uninhabited Aerial System	153
<i>Robert Burns</i>	

Distributed and Remote Control of Flight Control Actuation using Power Line Communications	163
<i>John O'Brien, Amit Kulshreshtha</i>	
Using Static Analysis to Improve Communications Infrastructure	175
<i>David Kleidermacher, Mike Wolf</i>	
Certification Concerns of Integrated Modular Avionics (IMA) Systems	181
<i>Gregg Bartley, Barbara Lingberg</i>	
A Portable ARINC 653 Standard Interface	193
<i>Sergio Santos, J. Rufino, T. Schoofs, C. Tatibana, J. Windsor</i>	
Incremental Certification and Integrated Modular Avionics	200
<i>Alex Wilson, Thierry Preyssler</i>	
Distributed IMA and DO-297: Architectural, Communication and Certification Attributes	208
<i>Roland Wolfig, Mirko Jakovljevic</i>	
ARINC 653 Role in Integrated Modular Avionics (IMA)	218
<i>Paul J. Priszczak</i>	
Best Practices in IMA Certification	228
<i>Leanna Rierson</i>	
Safer Systems: A NextGen Aviation Safety Strategic Goal	234
<i>S. Darr, W. Ricks, K. A. Lemos</i>	
An Analysis of Automation for Monitoring Area Navigation (RNAV) and Required Navigation Performance (RNP) Terminal	242
<i>Kathryn A. Klein, Jeffery P. Shepley</i>	
The Federal Aviation Administration 2008 Portfolio for Research and Development	254
<i>Paul Krois, Lee Olson, Cathy Bigelow</i>	
Analysis of Advanced Flight Management Systems (FMS), Flight Management Computer (FMC) Field Observations Trials, Radius-To-Fix Path Terminators	263
<i>Al Herndon, Mike Cramer, Kevin Sprong</i>	
Optical Tracking and Auto-Alignment Transceiver System	278
<i>Gabriel A. Cap, Hakki H. Refai, James J. Sluss</i>	
Interference Mitigation for Broadband L-DACS	287
<i>M. Schnell, S. Brandes, S. Gligorevic, M. Walter, C. Rihacek, M. Sajatovic, B. Haindl</i>	
Communication Capacity Assessment for the Iris Satellite System	299
<i>C. H. Rokitansky, M. Ehammer, T. Grupl</i>	
Cognitive Radio for Aeronautical Air-Ground Communications	312
<i>Yang Wang</i>	
A Novel Algorithm for Realistic Generation of Input Traffic for ATM Applications	320
<i>Stefano Elefante</i>	
The Implications of New Aircraft Types on the Next Generation Air Transportation System	332
<i>Frederick Wieland, George Hunter, David Schleicher</i>	
Literature Review of Air Traffic Controller Modeling for Traffic Simulations	340
<i>Johan De Prins, Ramn Gomez Ledesma</i>	
Procedures for Off-Nominal Cases: Very Closely Spaced Parallel Runway Operations	351
<i>Savita Verma, Sandy Lozito, Deborah Ballinger, Herbert Resnick</i>	

ASIAS: Aviation Safety Information Analysis and Sharing	362
<i>Carl Halford, Michelle Harper</i>	
Time Shifting Beacon Radar Reports	375
<i>Robert D. Oaks, Mike M. Paglione</i>	
Analysis of Localizer and Glide Slope Flight Technical Error	385
<i>Timothy Hall, Melanie Soares</i>	
Surveillance at Colorado Mountain Airports	394
<i>William E. Payne</i>	
Tower Information Display System: The System Architecture, Feasibility Results, and the Next Steps	409
<i>Jonathan T. Lee, Daniel Hannon</i>	
Exploration of New Algorithms for Airborne Collision Detection and Avoidance to Meet NextGen Capabilities	410
<i>Roxaneh Chamlou, W. Dwight Love, Chris Moody</i>	
Security Considerations for IP based Aeronautical Networks	423
<i>Max Ehammer, Thomas Grupl, Carl-Herbert Rokitansky, Thorsten Brikey</i>	
Link-Layer Quality of Service in the L-Band Digital Aeronautical Communication System B-AMC	436
<i>Thomas Grupl, Max Ehammer, Carl-Herbert Rokitansky</i>	
Role of Avionics in Trajectory Based Operations	449
<i>Michael R. C. Jackson</i>	
ERASMUS Contribution to the 2020 SESAR Scenario	458
<i>Gilles Gawinowski, Fabrice Drogoul, Roger Guerreau , Rosa Weber, Jean-Louis Garcia</i>	
Validating the Incremental Benefits of NEXTGEN Transformational Elements	468
<i>Marc Narkus-Kramer, Deborah A. Kirkman , Alfred H. Anderegg</i>	
4D Without Airborne FMS	476
<i>Alexander Kuenz</i>	
Analysis of AIRE Continuous Descent Arrival Operations at Atlanta and Miami	486
<i>Kevin Sprong, Katie Klein, Camille Shiotsuki, James Arrighi, Sandy Liu</i>	
Prototype Flight Management Capabilities to Explore Temporal RNP Concepts	499
<i>Mark G. Ballin, David H. Williams, B. Danette Allen, Michael T. Palmer</i>	
Preliminary Assessment of Interactions Between TFM and Dynamic Resectorization	511
<i>George Hunter</i>	
En Route Merging and Spacing Preparation Concept of Operations	521
<i>Peter Moertl, Emily Beaton, Karen Viets</i>	
Airspace Partitioning Using Flight Clustering and Computational Geometry	530
<i>Chris R. Brinton, Stephen Pledge</i>	
Analysis of an Optimal Sector Design Method	540
<i>Michael Drew</i>	
Airspace Availability Estimation For Traffic Flow Management Using The Scanning Method	550
<i>Alexander Klein</i>	
3D Airspace Design by Evolutionary Computation	560
<i>Daniel Delahaye, Stephane Puechmorel</i>	

Multiple Targets Estimation and Tracking for ADS-B Radar System	573
<i>Ming-Shih Huang, Ram M. Narayanan</i>	
Analysis of Airspace Tube Structures	583
<i>Kapil S. Sheth, T. O. S. Islam, P. H. Kopardekar</i>	
Flight Deck-Based Merging and Spacing Impact on Flight Crew Operations During Continuous Descent Arrivals and Approaches	593
<i>William Penhallegon, Randall Bone</i>	
Potential Benefits of a Paired Approach Procedure to Closely Spaced Parallel Runways in Instrument and Marginal Visual Conditions	607
<i>Anand D. Mundra, Wayne W. Cooper, Arthur P. Smith, Laurence F. Audenaerd, Clark R. Lunsford</i>	
Conflict Resolution Support for Air Traffic Control Based on Solution Spaces: Design and Implementation	623
<i>Joris Koeners, Michiel De Vries</i>	
Design of an Air-Air Negotiation Protocol to Reorder Aircraft Arrivals Sequence	632
<i>Jos Miguel Canino, Luis Gumez</i>	
Improving TMA Sequencing Process: Innovative Integration of AMAN Constraints in Controllers Environment	643
<i>Vincent Kapp, Morad Hripane</i>	
Management of Holding Patterns: A Potential ADS-B Application	652
<i>Arthur P. Smith, Hilton Bateman</i>	
Estimating Taxi-Out Times with a Reinforcement Learning Algorithm	664
<i>Poornima Balakrishna, Rajesh Ganesan, Lance Sherry, Benjamin S. Levy</i>	
Optimally and Equitably Distributing Delays with the Aggregate Flow Model	676
<i>Michael Bloem, Banavar Sridhar</i>	
Game-Theoretical Method for Conflict Resolution	690
<i>Zheng Lei, Zhang Jun, Zhu Yanbo</i>	
Managing Arrivals in Super-Dense Operations: Guidance Based on a Cognitive Walkthrough	698
<i>P. J. Smith, A. Spencer, M. Evans, J. Krozel, A. D. Andre</i>	
Observation and Measurement of Metroplex Phenomena	708
<i>Stephen Atkins</i>	
Integrated Departure Route Planning	723
<i>Anthony Masalonis, Hilton Bateman, Lixia Song, Norma Taber, Craig Wanke, Richard Delaura</i>	
A New Modeling Capability for Airport Surface Traffic Analysis	735
<i>G. Couluris, R. Fong, M. Downs, N. Mihler, D. Signor, A. Stassart</i>	
Increase Airline Takeoff and Landing Sequences on Present Runways	746
<i>Daniel Gellert</i>	
A New Ecological Primary Flight Display Concept	755
<i>T. Lambregts, R. Rademaker, E. Theunissen</i>	
Human Involvement in Dynamic Reconfiguration of Integrated Modular Avionics	775
<i>Giuseppe Montano, John McDermid</i>	
Taxi Route Input – Specification or Selection?	788
<i>E. Theunissen, F. D. Roefs, G. J. M. Koeners, O. Bleeker</i>	
Predictive Information: Status or Alert Information?	798
<i>A. Trujillo, D. Bruaeau</i>	

Elements for Prioritizing between Conflict Resolutions in Air Traffic Control	807
<i>Philippe Averty</i>	
Analysis of Controller-Pilot Communication Performance in Area Navigation (RNAV) and Conventional Arrival Operations	818
<i>Elida C. Smith</i>	
Symbology Evaluation for Strategic Weather Information on the Flight Deck	830
<i>Thomas Grasse, Christina Schilke, Jens Schiefele</i>	
Neurophysiological Workload Assessment in Flight	842
<i>Tom Schnell</i>	
Fusion of Smart Sensor Standards and Sensors with Self-Validating Abilities	856
<i>Pavel Paces, Michal Reinštein, Karel Draxler</i>	
A Concept for UAV Operator Involvement in Airborne Conflict Detection and Resolution	869
<i>J. Tadema, Den Helder, E. Theunissen</i>	
Unmanned Aircraft Research in Support of NextGen Trajectory Based Operations	881
<i>Kevin McEntee, Bill Nix, Geoff Lloyd</i>	
Challenges in Developing Sense & Avoid Capability for Unmanned Aircraft Systems	890
<i>Andrew Zeitlin</i>	
A Gimbaled Platform for MAV Autopilot Simulation and Calibration	897
<i>Justin Shumaker, Kamal S. Ali, Lamarious Carter</i>	
Flexible Electrical Manager Service for UAS Applications Development	907
<i>Pablo Royo, Juan Lopez, Enric Pastor, Cristina Barrado</i>	
Developing a Distributed Real-time Monitoring System to Track UAVs	916
<i>Diogo Branquinho Ramos, Denis Silva Loubach, Adilson Marques Da Cunha</i>	
UAS in Civil Airspace: Demonstrating “Sense And Avoid” Capabilities in Flight Trials	925
<i>Bernd Korn, Christiane Edinger</i>	
Comparison of See-and-Avoid Performance in Manned and Remotely Piloted Aircraft	932
<i>Ryan Kephart, Michael S. Braasch</i>	
Evaluation of a “Stereo” Radar Approach for Terrain Reconstruction Using Synthetic Data	940
<i>Sven Schmerwitz, Niklas Peinecke, Hans-Ullrich Döhler, Bernd Korn</i>	
Lidar Simulation Using Graphics Hardware Acceleration	953
<i>Niklas Peinecke, Thomas Lueken, Bernd R. Korn</i>	
Detection of Mobile Runway Obstacles using Dual Airborne Laser Scanners	961
<i>Mark Smearcheck, Ananth Vadlamani, Maarten Uijt De Haag</i>	
Quality of Training Effectiveness Assessment (QTEA); A Neurophysiologically Based Method to Enhance Flight Training	969
<i>Tom Schnell, Mike Keller, Pieter Poolman</i>	
Development of a System Integration Laboratory for Aircraft Avionics Systems	982
<i>Myung Chin Kim, Woo Seop Oh, Jong Hoon Lee, Jong Bong Yim, Yeon Deog Koo</i>	
Design and Evaluation of a GUI for Operator Involvement in Airborne Conflict Detection and Resolution	993
<i>J. Tadema, E. Theunissen</i>	
A Flexible Solution to Deploy Avionics Displays to Multiple Embedded Platforms	1005
<i>Yannick Lefebvre</i>	

Runway Obstacle Detection Using Onboard Sensors: Modeling and Simulation Analysis	1014
<i>Ananth Vadlamani, Mark Smearcheck, Sumit Bhattacharya, Zhen Zhu, Maarten Uijt De Haag</i>	
Sensitivity Study for Long Term Reliability	1026
<i>Allen.L.White</i>	
Killing Gateways: Applying the RTS framework to Improve Avionics Systems Performance	1038
<i>Emilia M. Colonese, Joo C. Nobre, Larcio S. Anjos, Jos M. P. Oliveira</i>	
Time Plotting Framework for Remote Display of Flight Data	1048
<i>Julien Esposito</i>	
On MC/DC and Implementation Structure: An Empirical Study	1057
<i>Mats Heimdahl</i>	
Applying the Use Case Points Effort Estimation Technique to Avionics Systems	1070
<i>Caio Monteiro Barbosa Da Silva, Denis Silva Loubach, Adilson Marques Da Cunha</i>	
Design and Application of Flight Situation MAP Service System for Air Traffic Management	1080
<i>Li Li, Luo Xiling, Liu Kai</i>	
Research on the Avionic Software Quality Evaluation Based on the WSR Methodology	1087
<i>Tianshu Wang, Deming Zhong</i>	
Airborne Surveillance and Separation Assurance Processing	1098
<i>Robert Eftekari, Roxaneh Chamlou, Daniel Kirk</i>	
System Mitigation Techniques for Single Event Effects	1111
<i>Laura Dominik</i>	
Back to the Moon: The Verification of a Small Microprocessor’s Logic Design	1123
<i>Hugh Blair-Smith, Richard Katz, Igor Kleyner</i>	
Satisfying Integrity Requirements for Highly Automated UAV Systems by a Systems Engineering Approach to Cognitive Automation	1135
<i>G. Jarasch, A. Schulte</i>	
Model-Based Design Analysis of an Avionics FUEL Distributed Control System	1147
<i>Carlos C. Insaurralde, Miguel A. Seminario, Juan F. Jimenez, Jos M. Giron-Sierra</i>	
Choosing a CRC and Specifying Its Requirements for Field-Loadable Software	1159
<i>Cleon Rogers</i>	
Influences of Data Bus Protocols on an Aircraft Elevator Flight Control Subsystem	1168
<i>Herminio Duque Lustosa</i>	
Safety-Specific Analysis as Additional Design Assurance for Microprocessors	1180
<i>Hakan Forsberg</i>	
Demonstration of a Formal Method for Incremental Qualification of IMA Systems	1192
<i>Jonas Elmqvist, Simin Nadjm-Tehrani</i>	
Communication Schemes for Aerospace Wireless Sensors	1200
<i>Jianhua Liu, Ilteris Demirkiran, Thomas Yang, Albert Helfrick</i>	
Software Model Checking for Avionics Systems	1209
<i>Darren Cofer, Michael Whalen, Steven Miller</i>	
An Airborne Collision Avoidance System for Low Altitude Flights Using Radio Data System	1217
<i>C.C Li, C. E. Lin, C.F. Tsai, S.C. Chiang</i>	

Electronic Barometric Altimeter in Real Time Correction	1223
<i>C.E. Lin, W.C. Huang, C.W. Hsu, C.C. Li</i>	
Research on Improvement of Position Accuracy for Satellite Navigation	1229
<i>Wang Zhipeng, Zhang Jun</i>	
A Neural Network Based Algorithm for Precise Transformation between GPS Height and Pressure Altitude	1239
<i>Ly Jiachuan, Zhang Xuejun</i>	
A Methodology for Designing Transition Route Network Between En-Route Airspace and Terminal Areas	1248
<i>Shuang Zhao, Xuejun Zhang</i>	

Author Index