

14th Australian International Aerospace Congress 2011

**Melbourne, Australia
28 February - 3 March 2011**

ISBN: 978-1-5108-0086-1

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2011) by Engineers Australia
All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact Engineers Australia
at the address below.

Engineers Australia
Engineering House
11 National Circuit
Barton ACT 2600

Phone: +61 2 6270 6555
Fax: (02) 6273 1488

memberservices@engineersaustralia.org.au

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

1A

COMMUNITIES OF PRACTICE PERSPECTIVE ON AEROSPACE ENGINEERING	1
<i>Goss, Simon; Heinze, Clint; Drobik, Jan</i>	

1B

DEVELOPMENT OF AN INFRARED SUPPRESSION SYSTEM FOR CH-47D CHINOOK HELICOPTERS	13
<i>Dolan, GW; Bardell, NS</i>	
INVESTIGATION OF MULTIPLE ORIFICE AIR JET VORTEX GENERATORS FOR FLOW CONTROL	24
<i>Shun, S; Ahmed, NA</i>	

1C

AN INVESTIGATION OF PITOT TUBE PERFORMANCE USING A WET WEATHER WIND TUNNEL TEST SECTION	34
<i>Flynn, TG; Ahmed, NA</i>	

1F

SEMI-AUTOMATIC CALIBRATION OF A STRAP-DOWN ATTITUDE AND HEADING REFERENCE SYSTEM	41
<i>Mizutani, A; Rosser, K; Chahl, J</i>	
PRECISE AUTONOMOUS AERIAL PAYLOAD DELIVERY SYSTEM INTEGRATED WITH UAV AND UGV	49
<i>Yakimenko, Oleg A; Slegers, Nathan J; Bourakov, Eugene A; Hewgley, Charles W</i>	

1G

SOLVING STRUCTURAL INTERACTION EQUATIONS IN THE DIGITAL AGE	58
<i>Bardell, NS</i>	
SYSTEM RELIABILITY-BASED FILTERING METHODS FOR DETERMINING CRITICAL LOCATIONS OF AIRCRAFT STRUCTURES	68
<i>Millwater, H; Sparkman, D; Domyancic, L; Smith, L; Wieland, D</i>	

1I

AN EFFICIENT STRATEGY TO INCORPORATE DESIGNER-PREFERENCES IN AUTOMATED AIRFOIL DESIGN	85
<i>Carrese, Robert; Khurana, Manas; Winarto, Hadi; Li, Xiaodong</i>	
NUMERICAL STUDY OF SYNTHETIC JETS WITH DUAL CIRCULAR ORIFICES	96
<i>Riazi, H; Ahmed, NA</i>	
AN EXAMINATION OF SUITABILITY OF MULTI HOLE PRESSURE PROBE TECHNIQUE IN SKIN FRICTION MEASUREMENT IN THREE DIMENSIONAL TURBULENT FLOW	106
<i>Lien, SJ; Ahmed, NA</i>	

1J

AIRCRAFT AUTOMATION TASKS REQUIRING SWITCHING CONTROL 116
Techakesari, Onvaree; Ford, Jason J

USING PULSED AIR SUPPLY TO REDUCE [CO₂] CONCENTRATION LEVEL IN AN AIRCRAFT CABIN 128
Wu, Chaofan; Ahmed, Noor A

ON THE INFLUENCES OF AN INCREASED ILS GLIDE SLOPE ON NOISE IMPACT, FUEL CONSUMPTION AND LANDING APPROACH OPERATION 138
Koenig, R; Schubert, E

2A

SCRAMSPACE : SCRAMJET-BASED ACCESS-TO-SPACE SYSTEMS..... 151
Boyce, Russell R

ATTITUDE GUIDANCE AND CONTROL FOR A SPINNING, ASYMMETRICAL ROCKET PAYLOAD 161
Creagh, Michael A; Mee, David J

2B

NUMERICAL INVESTIGATION OF THE SHOCK FORMATION PROCESS IN UNDEREXPANDED JETS 173
Li, S; Muddle, B; Jahedi, M; Soria, J

2C

MULTI-CORE CPUS FOR MISSION COMPUTING AND SOFTWARE 183
Mathers, Michael P; Lemmo, Simon; Heuer, Paul

2F

DECONFLICTING THE UNMANNED SKY: AN ANALYSIS OF UAV DECONFLICTION DATA 193
Joyce, Keirin

2I

MULTI-OBJECTIVE DESIGN EXPLORATION AND ITS APPLICATION TO FORMULA ONE AIRFOILS 195
Watts, Matthew; Winarto, Hadi; Carrese, Robert

FORMULA 1 AERODYNAMICS: VERSATILITY OF THE NLF(1)-0414F AIRFOIL AT LOW REYNOLDS NUMBERS 205
Marques-Bruna, P; Grimshaw, P

2J

SIMULATION OF AERIAL REFUELLING IN A DISTRIBUTED SYNTHETIC ENVIRONMENT 215
Ryan, Peter; Oliver, Will

FLIGHT TESTING OF AN AUGMENTED SEPARATION MANAGEMENT SYSTEM PROVIDING SEPARATION PROTECTION DURING FAILURE OF THE CENTRAL COMMUNICATION NETWORK 231
Fan, Jiezhen Sean; Ford, Jason

3A

HEAT DISSIPATION CONSIDERATIONS OF A HORIZONTAL TAKE-OFF LAUNCHER DURING RE-ENTRY INTO THE EARTH'S ATMOSPHERE	242
<i>Ahmed, NA; Kinkaid, NM; Page, JR; Olsen, J</i>	

3C

THE QUALITY OF SERVICE AND NETWORK MANAGEMENT OF A MULTI-TDL NETWORK SYSTEM.....	252
<i>Ding, Yulin; Filippidis, Arthur</i>	
THE INTEGRATION PROBLEM OR THE PROBLEM WITH INTEGRATION	262
<i>Hales, Ryan</i>	

3F

POLARISATION COMPASSING FOR UAV NAVIGATION.....	266
<i>Chahl, J; Rosser, K; Mizutani, A</i>	
THE AUSTRALIAN ARMY AND UNMANNED AERIAL VEHICLES... 20 YEARS ON AND STILL NOTHING IN SERVICE.....	276
<i>Joyce, Keirin</i>	

3G

THE F/A-18A/B HORNET OUTER WING STATIC TEST PROGRAM (HOWSAT).....	286
<i>Needham, G; Kloeden, R</i>	
PROBABILISTIC RISK ANALYSIS FOR THE C-130 CW-1 LOCATION.....	295
<i>Torregosa, Ribelito F; Hu, Weiping</i>	

3H

A REVOLUTIONARY APPROACH TO THE ANALYSIS OF BUCKLING OF THIN CYLINDRICAL SHELLS	306
<i>Hart-Smith, LJ</i>	
FINITE ELEMENT MODELLING OF MULTI-LAYER COMPOSITES USING MICROCT SCAN RESULTS.....	340
<i>Djukic, Luke P; Bannister, Michael K; Mollenhauer, David H</i>	

3J

LARGE AIRCRAFT TAKEOFF PATH OPTIMIZATION OUT OF TERRAIN CHALLENGING AIRPORTS	349
<i>Masson, Bertrand; Bain, Mike; Page, John</i>	

4B

THE SIMULATION OF GAS TURBINE TURBOJET ENGINES FOR AIRCRAFT PROPULSION	359
<i>Olsen, John; Page, John</i>	

4C

LINK 16 INTEGRATION INTO AIRBORNE MISSION SYSTEMS	366
<i>Gulley, Robert</i>	

DYNAMIC ANALYSIS OF A FLAPPING-WING TEST STAND	372
<i>Jones, MB; Valiyff, A; Harvey, JR</i>	

4F

AIRCRAFT DESIGN OF AN ENDURANCE UAV PLATFORM FOR MULTIPLE MISSION REQUIREMENTS	382
<i>Paulus, D; Speck, S; Schomann, J; Rossler, C; Hornung, M</i>	

4G

UPDATED AND IMPROVED STRUCTURAL INTEGRITY MANAGEMENT FOR THE RAAF AP-3C MARITIME PATROL AIRCRAFT FLEET BASED ON A COMPREHENSIVE PROGRAM OF TESTING AND ANALYTICAL MODEL DEVELOPMENT	392
<i>Walker, K; Matricciani, E; Duthie, J; Lubacz, J</i>	

4J

AIRCRAFT EMISSION REDUCTION THROUGH MULTI-DISCIPLINARY FLIGHT PATH OPTIMISATION	408
<i>Gonzalez, LF; Lee, DS; Walker, R; Periaux, J</i>	

5A

APPARENT MOTION OF THE RUNWAY SIDELINES AS A VISUAL CUE TO FLARE TIMING: AN INVESTIGATION THROUGH FULL FLIGHT SIMULATOR EXPERIMENTS	420
<i>Entzinger, Jorg O; Suzuki, Shinji</i>	
RAPID AUTOMATED AIRCRAFT SIMULATION MODEL UPDATING FROM FLIGHT DATA	430
<i>Brian, Geoff; Morelli, Eugene A</i>	

5B

RESEARCH ON THE COOLING CHANNELS OF THE PREBURNERS FOR SMALL LIQUID ROCKET ENGINE	440
<i>Moon, Insang; Lee, SunMee; Yoo, Jae Han; Lee, Soo Yong; Moon, Il Yoon</i>	

5G

OLD IDEAS ENABLED THROUGH MODERN TECHNOLOGY	448
<i>Craddock, David A</i>	

5H

OVERVIEW OF USTO'S PAST AND FUTURE RESEARCH INTO CORROSION STRUCTURAL INTEGRITY	458
<i>Crawford, BR; Loader, C; Sharp, PK</i>	
DSTO - NLR COLLABORATIVE PROGRAMME ON FATIGUE PROPERTIES OF β-ANNEALED TI-6AL-4V: PRELIMINARY RESULTS	467
<i>Amsterdam, E; Shekhter, A; Barter, S; McDonald, M</i>	

5J

THE SMALL SCALES OF TURBULENCE: A SIGNIFICANT CHALLENGE TO MICRO FLIGHT	474
<i>Thompson, Mark A; Watkins, Simon</i>	

6A

SUSTAINING AIRCRAFT STRUCTURAL INTEGRITY: RISK AND VALUE MANAGEMENT 483
Wilson, Eric S

THROUGH-LIFE SUPPORT AS A SERVICE: THE ROLE OF AIRCRAFT MANUFACTURERS 493
Webb, Luke T; Bil, Cees

THE AP-3C REPAIR ASSESSMENT MANUAL (RAM) 504
Krutop, B; Watters, KC

6B

FATIGUE-INITIATING DISCONTINUITIES IN AIRCRAFT STRUCTURES 517
Barter, SA; Molent, L; Wanhill, RJH

6C

CONTROL SYSTEM DESIGN AND OPTIMISATION VIA GENETIC PROGRAMMING..... 539
Bourmistrova, Anna

FIREFIGHTER UAV AIRFOIL DESIGN VIA EVOLUTIONARY ALGORITHMS 548
Hudiono, Adrian Osmond; Carreres-Talens, Marcos; Winarto, Hadi

6F

**COORDINATION OF MISSION ROLES FOR SEMI-AUTONOMOUS UAVS IN A SIMULATED
COMBAT ENVIRONMENT** 558
Cheng, Haoyang; Page, John R; Kinkaid, Nathan M; Olsen, John F

AERODYNAMIC TESTING OF A SMALL, HOVERING ENTOMOPTER..... 565
Palmer, Jennifer L; Harvey, James R; Valiyff, Aliya; Jones, Malcolm B

6G

**MEASUREMENT AND COMMUNICATION OF MILITARY AVIATION SOFTWARE SAFETY
RISKS** 575
Redmond, Patrick

RISK BASED APPROACH TO COMPLIANCE ASSURANCE..... 585
Norman, Shaun

**THE CERTIFICATION AND QUALIFICATION FLIGHT TEST CAMPAIGN OF THE TANKER
KC30 FOR THE RAAF** 592
Morell, Miguel A

6H

**INFLUENCE OF HEAT TREATMENT OF AGING ON THE MECHANICAL PROPERTIES OF
ALUMINIUM 6063 T5 AND 6061 T6**..... 608
Avila, Carlos Arturo Bohorquez

6I

**PRESSURE FLUCTUATIONS OVER AN AIRFOIL IN SMOOTH AND TURBULENT FLOW AT
LOW REYNOLDS NUMBER**..... 615
Ravi, S; Watkins, S; Petersen, P

7A

ROSCOSMOS AND AUSTRALIA PERSPECTIVE COOPERATION TRENDS	627
<i>Raykunov, Gennady; Panichkin, Nikolay; Ivanov, Viktor</i>	

7B

HEURISTIC APPROACHES FOR FLIGHT AND MAINTENANCE PLANNING	628
<i>Winata, Leonard; Ozlen, Melih; Wang, Chun</i>	

7F

PRELIMINARY FLIGHT TESTING OF AUTONOMOUS SOARING WITH THE KAHU UAS	645
<i>Palmer, Jennifer L; Ashman, Daniel M; Strong, Philip A; Gough, Michael D; Wharington, John M</i>	
UNMANNED AERIAL VEHICLE: DEVELOPMENT TRENDS AND TECHNOLOGY IN SINGAPORE	657
<i>Srigrarom, Sutthiphong</i>	

7G

RISK ANALYSIS OF SAFETY BY INSPECTION OF AGEING AIRCRAFT	671
<i>Watters, KC; Livingstone, PC</i>	
TECHNICAL TEST RESULTS OF THE SYSTEM "INTRANS" FOR USE DURING THE ACCIDENT AIRCRAFT	685
<i>Zalogin, I; Zolotarev, V; Kuchmiyev, V; Borodin, A; Grudiy, V; Perelygin, S</i>	

7H

AGEING AIRCRAFT SYSTEMS AUDIT - FIGHTING THE AGEING PROCESS	692
<i>Boykett, Rob; Goodwin, Andrew</i>	

7I

DYNAMIC SURFACE PRESSURE MEASUREMENTS ON A FLAPPING WING MODEL	702
<i>Fisher, A; Watkins, S; Watmuff, J</i>	
Author Index	