

# **Human Powered Flight, New Challenges 2010**

**London, United Kingdom  
21 September 2010**

**ISBN: 978-1-5108-0181-3**

**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© (2010) by the Royal Aeronautical Society  
All rights reserved.

Printed by Curran Associates, Inc. (2015)

For permission requests, please contact the Royal Aeronautical Society  
at the address below.

Royal Aeronautical Society  
No. 4 Hamilton Place  
London  
W1J 7BQ  
United Kingdom

Phone: +44 (0) 20 7670 4300  
Fax: +44 (0) 20 7670 4309

[www.raes.org.uk](http://www.raes.org.uk)

**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](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

<b>Opportunities and Challenges in Applying Next Generation Computer Architectures to Training Devices .....</b>	1
<i>D. White</i>	
<b>Real Time Ray Tracing – Will it Ever Take Off? .....</b>	11
<i>S. Skinner</i>	
<b>Will Pilots Train Using Their Home TV As The Primary Display Device For 'Out Of The Window' Scenes? .....</b>	24
<i>O. Wynn</i>	
<b>Flight Simulation for Safety Workshop .....</b>	45
<i>J. Schroeder, S. Advani, P. Grant</i>	
<b>Flight Simulation Research at UTIAS .....</b>	57
<i>P. Grant, S. Advani</i>	
<b>Lifting Standards: Development of a Methodology for the Fidelity Assessment of Flight Simulators.....</b>	75
<i>M. White, E. Timson, P. Perfect, L. Lu, G. Padfield</i>	
<b>Full-Envelope Aerodynamics Modeling of a General Aviation Aircraft with Propeller Slipstream Effects .....</b>	88
<i>J. Ralston, R. Hultberg</i>	
<b>Reverse Engineering an EC-135 Helicopter to Produce a Level D Simulator .....</b>	97
<i>S. Smith, B. Torgler</i>	
<b>Aircraft Icing: The Cold Hard Facts.....</b>	106
<i>N/A</i>	
<b>Transport Delay: What Does it Mean and Why Does it Matter?.....</b>	129
<i>J. Carlton</i>	
<b>The Objective Motion Cueing Test: Time Domain .....</b>	137
<i>R. Armstrong</i>	
<b>Changes in Pilot Control Behaviour Across Stewart Platform Motion System.....</b>	151
<i>F. Nieuwenhuizen</i>	
<b>A Cybernetic Approach to Simulator Motion Fidelity .....</b>	162
<i>O. Stroosma, H. Damveld, D. Pool</i>	
<b>ICAO 9625 Ed. 3 – RAeS Motion Task Team – Objective Motion Cueing Test (OMCT) Initiative .....</b>	175
<i>J. Takats</i>	
<b>Mission Essential Competency training with Remotely Piloted Aerial Systems.....</b>	194
<i>G. Bedford</i>	
<b>Update on Progress: ICATEE Research &amp; Technology Team .....</b>	203
<i>J. Schroeder, S. Advani</i>	
<b>Massive Scale Agent Based Simulation with FLAME and FLAME GPU .....</b>	230
<i>P. Richmond</i>	
<b>Application of Adaptive Agents in Tactical Simulation.....</b>	243
<i>J. Roessingh, P. Huibers, R. Rijken</i>	
<b>Acquisition and Modeling of Propeller Effects in Aircraft Simulation .....</b>	256
<i>J. Ralston, R. Hultberg</i>	
<b>Modeling and Application of In-flight Icing Effects for Flight Training .....</b>	267
<i>D. Gingras</i>	
<b>Integration of Dissimilar Simulators, Aircraft and Systems - A Practical Study .....</b>	280
<i>D. Allerton, G. Spence</i>	
<b>Achieving Eye-Limiting Resolution: The Devil in the Details.....</b>	293
<i>J. Archeacon, B. Sweet, N. Iwai, K. Kato</i>	
<b>Status of the ICAO Objective Motion Cueing Test.....</b>	314
<i>R. Hosman, S. Advani, J. Takats</i>	
<b>Operator Training and Performance Measurement in Remotely Piloted Systems .....</b>	330
<i>G. Bedford, R. Kalawsky</i>	
<b>The Application of Game-Based Artificial Intelligence to Flight Simulation .....</b>	339
<i>N. Giannias</i>	
<b>High-performance Simulation of Multi-agent Systems on HPC and GPU Architectures .....</b>	347
<i>T. Karmakham, S. Coakley, P. Richmond</i>	
<b>Applying Rocket Science to Rehabilitation.....</b>	362
<i>G. Fernie, S. Advani</i>	

**Computational Visualization - Creating Realism without Dropping Frames!** ..... 382

*D. Traill*

**Author Index**