

# **Symposium on Simulation for Architecture and Urban Design 2011**

**(SimAUD 2011)**

**2011 Spring Simulation Multiconference – Book 8 of 8  
Simulation Series Volume 43#3 2011**

**Boston, Massachusetts, USA  
3-7 April 2011**

**Editors:**

**Ramtin Attar**

**ISBN: 978-1-61782-842-3**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[www.proceedings.com](http://www.proceedings.com)



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

**© 2011 SIMULATION COUNCILS, INC.**

Responsibility for the accuracy of all statement in each paper rests solely with the author(s). Statements are not necessarily representative of, nor endorsed by, The Society for Modeling and Simulation International.

Printed by Curran Associates, Inc. (2011)

Permission is granted to photocopy portions of this publication for personal use and for the use of students provided credit is given to the conference and publication. Permission does not extend to other types of reproduction nor to copying for incorporation into commercial advertising nor for any other profit-making purpose. Other publications are encouraged to include 300- to 500-word abstracts or excerpts from any paper contained in this book, provided credits are given to the author and the conference. For permission to publish a complete paper write: The Society for Modeling and Simulation International (SCS), P.O. Box 17900, San Diego, CA 92177, USA.

**Additional copies of the Proceedings are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571  
[curran@proceedings.com](mailto:curran@proceedings.com)  
[www.proceedings.com/0128.html](http://www.proceedings.com/0128.html)

OR

The Society for Modeling  
and Simulation International  
2598 Fortune Way, Ste I  
Vista, CA 92081 USA

ISBN: 978-1-61782-842-3  
PRINTED IN THE UNITED STATES

# SimAUD TABLE OF CONTENTS

TITLE/AUTHORS	PG#
Preface	4
Lifecycle Building Card Towards paperless and visual lifecycle management tools <a href="#">Holger Graf, Souheil Soubra, Guillaume Picinbono, Ian Keough, Alex Tessier and Azam Khan (holger.graf@igd.fraunhofer.de)</a>	5
Automated Energy Model Creation for Conceptual Design <a href="#">Lillian Smith, Kyle Bernhardt and Matt Jezyk (lillian.smith@autodesk.com)</a>	13
GRAPE: A parametric shape grammar implementation <a href="#">Thomas Grasl and Athanassios Economou (tg@swap-zt.com)</a>	21
Generative Fluid Dynamics: Integration of Fast Fluid Dynamics and Genetic Algorithms for wind loading optimization of a free form surface. <a href="#">Angelos Chronis and Alasdair Turner (angelos.chronis.09@ucl.ac.uk)</a>	29
Solar Zoning and Energy in Detached Residential Dwellings <a href="#">Jeffrey Niemasz, Jon Sargent and Christoph Reinhart (jniemasz@gsd.harvard.edu)</a>	37
3D Scans of As-Built Street Scenes for Virtual Environments <a href="#">Naai-Jung Shih, Chia-Yu Lee and Tzu-Ying Chan (shihnj@mail.ntust.edu.tw)</a>	46
Designing with Deformation - Sketching material and aggregate behaviour of actively deforming material systems <a href="#">Anders Holden Deleuran (andersholden.deleuran@karch.dk)</a>	52
Use of Sub-division surfaces architectural form-finding and procedural modelling <a href="#">shajay bhooshan and Mostafa El Sayed (shajay.bhooshan@zaha-hadid.com)</a>	60
Components for Parametric Urban Design in Grasshopper. From Street Network to Building Geometry <a href="#">Christian Schneider and Anastasia Koltsova (koltsova@arch.ethz.ch)</a>	68
A simple method to consider energy data in the architectural conception of dwelling buildings <a href="#">Laëtitia Arantes, Olivier Baverel, Pascal Rollet and Daniel Quenard (laetitia.arantes@cstb.fr)</a>	76

TITLE/AUTHORS	PG#
A methodological study of environmental simulation in architecture and engineering. Integrating daylight and thermal performance across the urban and building scales. <a href="mailto:peter.sattrup@karch.dk">Peter Andreas Sattrup and Jakob Strømmand-Andersen (peter.sattrup@karch.dk)</a>	84
Analysis of Sustainable Manufacturing Using Simulation for Integration of Production and Building Service <a href="mailto:john.michaloski@nist.gov">John Michaloski, Jorge Arinez, Guodong Shao, Swee Leong, Kevin Lyons and Frank Riddick (john.michaloski@nist.gov)</a>	93
Multi-Objective Optimization in Urban Design <a href="mailto:kh2388@columbia.edu">Michele Bruno, Kerri Henderson and Hong Min Kim (kh2388@columbia.edu)</a>	102
City of Love and Hate <a href="mailto:ai2247@columbia.edu">Adnan Ihsan, Amirali Merati, Eva Pouloupoulou and Foteinos Soulos (ai2247@columbia.edu)</a>	110
Leveraging Cloud Computing and High Performance Computing Advances for Next-generation Architecture and Urban Design Projects <a href="mailto:francesco.iorio@autodesk.com">Francesco Iorio and Jane L. Snowdon (francesco.iorio@autodesk.com)</a>	118
A New System Dynamics Framework for Modeling Behavior of Vehicle Sharing Systems <a href="mailto:dimp@MIT.EDU">Dimitris Papanikolaou (dimp@MIT.EDU)</a>	126
Sensor Placement Tool for Rapid Development of Video Sensor Layouts <a href="mailto:garaas@merl.com">Tyler Garaas (garaas@merl.com)</a>	134
Visualizing Urban Systems: Revealing City Infrastructures <a href="mailto:dck2103@columbia.edu">Chris Kroner, Phu Duong, Liz Barry and Mike Szivos (dck2103@columbia.edu)</a>	138
Real-Time Occupancy Detection using Decision Trees with Multiple Sensor Types <a href="mailto:Rhys.Goldstein@autodesk.com">Ebenezer Hailemariam, Rhys Goldstein, Ramtin Attar and Azam Khan (Rhys.Goldstein@autodesk.com)</a>	141
An integrated approach to algorithmic design and environmental analysis <a href="mailto:robert.aish@autodesk.com">Robert Aish and Andrew Marsh (robert.aish@autodesk.com)</a>	149
Irregular Vertex Editing for Architectural Geometry <a href="mailto:Dr.Yoshihiro.Kobayashi@gmail.com">Yoshihiro Kobayashi and Peter Wonka (Dr.Yoshihiro.Kobayashi@gmail.com)</a>	156
SpringSim'11 Consolidated Authors' Index	