## **Summer Computer Simulation Conference 2009**

# (SCSC 2009)

Part of the 2009 International Summer Simulation Multiconference (ISMc) Simulation Series Volume 41#3 2009

Istanbul, Turkey 13-16 June 2009

**Editors:** 

Osman Balci Xiaolin Hu Maarten Sierhuis Levent Yilmaz

ISBN: 978-1-61839-181-0

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

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



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

#### © 2009 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), 2598 Fortune Way, Suite I, San Diego, CA 92081, USA.

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

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 <u>curran@proceedings.com</u> www.proceedings.com/0128.html

or

The Society for Modeling and Simulation International 2598 Fortune Way, Ste I Vista, CA 92081 USA <u>www.scs.org</u>

### ISBN: 978-1-61839-181-0 PRINTED IN THE UNITED STATES

### **SCSC 2009 TABLE OF CONTENTS**

| <u>Title/Authors</u>  | <u>Pg #</u> |
|---|-------------|
| EGR DESIGN USING AHDL + CFD<br>GILLES DELAIRE AND KIRK IVENS (GILLES.DELAIRE@CONTINENTALCORPORATION.COM)  | 6           |
| SIMULATION OF ALTERNATIVES FOR TRANSMISSION PLANT ASSEMBLY LINE<br>JOHN DUNBAR III, JUNG-WEN LIU AND EDWARD WILLIAMS (WILLIAME@UMD.UMICH.EDU)                                     | 17          |
| MODELING AND SIMULATION OF 3-D VIRTUAL CELL AS A GAME<br>ISAAC BARJIS, DAVID SMITH AND WALLIED SAMARRAI (IBARJIS@CITYTECH.CUNY.EDU)   | 24          |
| MODELING DAYTIME AND NIGHT ILLUMINATION<br>CAGATAY UNDEGER (CAGATAY@UNDEGER.COM)  | 33          |
| EFFECTIVENESS OF PARTICLE SWARM OPTIMIZATION TECHNIQUE IN DEALING WITH NOISY<br>DATA IN INVERSE HEAT CONDUCTION ANALYSIS<br>SOHEYL VAKILI AND MOHAMED GADALA (GADALA@MECH.UBC.CA) | 40          |
| DISTRIBUTED MANAGEMENT OF ELEMENTS FOR MODELING AND SIMULATION OF<br>HETEROGENEOUS MODELS<br>BRAULIO ADRIANO DE MELLO AND ANDERSON ALBUQUEROUE PARREIRAS (BMELLO@DCC LIELA BR)    | 49          |
| ADVANCING COGNITIVE AGENT-BASED MODELING: PERSONIFYING THE AGENTS<br>CATHERINE BANKS AND JOHN SOKOLOWSKI (JSOKOLOW@ODU.EDU)   | 54          |
| A GENETIC ALGORITHM FOR WEAPON TARGET ASSIGNMENT PROBLEM<br>MEHMET ALPER SAHIN AND KEMAL LEBLEBICIOGLU (ALPER.SAHIN@ILTAREN.TUBITAK.GOV.TR)                                       | 61          |
| RETHINKING M&S USING MODELS OF CREATIVE COGNITION TO ENHANCE COMPUTATIONAL<br>DISCOVERY<br>LEVENT YILMAZ AND TUNCER OREN (YILMAZ@AUBURN.EDU)                                      | 66          |
| USER-GUIDED TRANSFORMATIONS FOR ONTOLOGY BASED SIMULATION DESIGN<br>OZER OZDIKIS, UMUT DURAK AND HALIT OGUZTUZUN (UDURAK@SAGE.TUBITAK.GOV.TR)                                     | 75          |
| A COMPARISON OF SYSTEM DYNAMICS AND DISCRETE EVENT SIMULATION<br>ANDREW GREASLEY (A.GREASLEY@ASTON.AC.UK)   | 83          |
| KEY ISSUES IN ELECTROMAGNETIC ENVIRONMENT MODELING & SIMULATION<br>LIN ZHANG, YINGNIAN WU AND RALPH C. HUNTSINGER (WUYINGNIAN@126.COM)  | 88          |
| ADVANCED AUTHORING TOOLS FOR GAME-BASED TRAINING<br>A. TANJU ERDEM, BORA UTKU, TOLGA ABACI AND CIGDEM EROGLU ERDEM (TERDEM@MOMENTUM-DMT.COM)                                      | 95          |
| AN ENGAGEMENT SIMULATION TO EVALUATE FIGHTER EVASIVE MANEUVERS COMBINED<br>WITH CHAFF UTILIZATION AGAINST MISSILES<br>REMZI AKDAG AND D.TURGAY ALTILAR (REMZIAKDAG@ITU.EDU.TR)    | 103         |

| A DYNAMIC REGION MATCHING ALGORITHM OF DDM  | 110 |
|---|-----|
| <u>YIPING YAO, YINGXING ZHANG, LILI CHEN AND LAIBIN YAN (YPYAO@NUDT.EDU.CN)</u>   |     |
| VARIABLE STRUCTURE AND DYNAMISM EXTENSIONS TO SIMA, A DEVS BASED MODELING<br>AND SIMULATION FRAMEWORK<br><u>FATIH DENIZ, AHMET KARA, MAHMUT NEDIM ALPDEMIR AND HALIT OGUZTUZUN</u><br>(AHMETK@ILTAREN.TUBITAK.GOV.TR)             | 117 |
| A SIMULATION APPROACH TO SIX SIGMA IN SOFTWARE DEVELOPMENT<br>VOJO BUBEVSKI (VOJO.BUBEVSKI@TCS.COM)   | 125 |
| AN EMULATION PLATFORM FOR INTELLIGENT SCHEDULING IN AUTOMATED CONTAINER TERMINAL  | 133 |
| MINGSEN GUO, ZAIZHOU MA, LU LIU AND JUN YE (MAZAIZHOU@YAHOO.COM.CN)   |     |
| A DECISION SUPPORT SYSTEM FOR DISASTER MANAGEMENT IN BUILDINGS<br>AVGOUSTINOS FILIPPOUPOLITIS AND EROL GELENBE (AFIL@IMPERIAL.AC.UK)  | 141 |
| SIMULATING REAL-TIME SOFTWARE COMPONENTS BASED ON LOGICAL EXECUTION TIME<br>ANDREAS NADERLINGER, JOSEF TEMPL AND WOLFGANG PREE (ANDREAS NADERLINGER@CS.UNI-SALZBURG.AT)   | 148 |
| VALIDATING INTERACTION-BASED SYSTEMS BEHAVIOR VIA SIMULATION AND DETECTING<br>IMPLIED SCENARIOS<br>MAMOUN SQALI, LUCILE TORRES AND CLAUDIA FRYDMAN (MAMOUN.SQALI@LSIS.ORG)  | 156 |
| RECURSIVE SIMULATION AND EXPERIMENTAL FRAME FOR MULTISCALE SIMULATION<br>BRUNO BONTÉ, RAPHAËL DUBOZ, GAUTHIER QUESNEL AND JEAN-PIERRE MÜLLER (BRUNO.BONTE@CIRAD.FR)   | 164 |
| HEALTHCARE MODELING AND SIMULATION POTENTIALS AND CHALLENGES<br>JOSEPH BARJIS (JBARJIS@GMAIL.COM)   | 173 |
| COMPARING SIMULATION OUTPUT ACCURACY OF DISCRETE EVENT AND AGENT BASED<br>MODELS:A QUANTITATIVE APPROACH<br>MAZLINA ABDUL MAJID, UWE AICKELIN AND PEER-OLAF SIEBERS (MVA@CS.NOTT.AC.UK)   | 177 |
| MODELING OF CHEMOKINE SIGNALING PATHWAY<br>NASREEN HAQUE, NILOUFAR HAQUE AND ISAAC BARJIS (IBARJIS@CITYTECH.CUNY.EDU)   | 185 |
| THIRD GENERATION OF "DYNAMIC IN-COCKPIT LIGHTING SYSTEM" FOR DRIVING SIMULATORS<br>PETR BOUCHNER AND STANISLAV NOVOTNÝ (BOUCHNER@LSS.FD.CVUT.CZ)  | 193 |
| IMPROVING WORKERS CONDITIONS WITHIN INDUSTRIAL WORKSTATIONS<br>ANTONIO CIMINO, DUILIO CURCIO, FRANCESCO LONGO AND GIOVANNI MIRABELLI (ACIMINO@UNICAL.IT)<br>RESEARCH ON COMPLEX SYSTEM QUANTITATIVE AND QUALITATIVE SYNTHETIC M&S | 200 |
| PLA I FORM<br><u>SHUAI FAN, BO HU LI, XUDONG CHAI, BOCUN HOU, WEIJING WANG AND YANXUN WU</u><br><u>(FANSHUAI30031021@YAHOO.COM.CN)</u>  | 208 |

| FROM SEQUENTIAL MACHINES TO DEVS<br>NORBERT GIAMBIASI (NORBERT.GIAMBIASI@LSIS.ORG)  | 216 |
|---|-----|
| PRIORITY-BASED SCHEDULING WITH ADAPTIVE SPECULATIVE LOCKING IN DISTRIBUTED<br>REAL-TIME TRANSACTION PROCESSING<br>WAQAR HAQUE (HAQUE@UNBC.CA)   | 223 |
| SIMULATION FOR EDUCATION IN RESOURCE MANAGEMENT IN HOMELAND SECURITY<br>AGOSTINO BRUZZONE, GERSON CUNHA, PRISCILLA ELFREY AND ALBERTO TREMORI (AGOSTINO@ITIM.UNIGE.IT)  | 231 |
| MULTILEVEL FORECASTING MODELS IN MANUFACTURING SYSTEMS<br>AGOSTINO G. BRUZZONE, ENRICO BOCCA, LUCA PIERFEDERICI AND MARINA MASSEI (AGOSTINO@ITIM.UNIGE.IT)  | 239 |
| MODELING PEOPLE FLOW: A REAL LIFE CASE STUDY IN ITU SCIENCE CENTER<br>SERDAR BAYSAN, DIDEM CINAR, DILAY CELEBI, PINAR DURSUN AND DILEK OZDEMIR (BAYSANS@ITU.EDU.TR)   | 246 |
| AGENTS WITH ABILITY TO UNDERSTAND EMOTIONS<br>MOHAMMAD KAZEMIFARD, NASSER GHASEM-AGHAEE AND TUNCER ÖREN (M.KAZEMIFARD@GMAIL.COM)  | 254 |
| DEVS IN DSOL: ADDING DEVS OPERATIONAL SEMANTICS TO A GENERIC EVENT-SCHEDULING<br>SIMULATION ENVIRONMENT<br>MAMADOU SECK AND ALEXANDER VERBRAECK (M.D.SECK@TUDELFT.NL)   | 261 |
| ANGER AND AGGRESSIVE BEHAVIOR IN AGENT SIMULATION<br>NASSER GHASEM-AGHAEE, BARDIA KHALESI, MOHAMMAD KAZEMIFARD AND TUNCER I. ÖREN<br>(M.KAZEMIFARD@GMAIL.COM)   | 267 |
| SIM-PETEK : A PARALLEL SIMULATION EXECUTION FRAMEWORK FOR GRID ENVIRONMENTS<br>DORUK BOZAGAC, GULSAH KARADUMAN, AHMET KARA AND M. NEDIM ALPDEMIR<br>(DORUKB@ILTAREN.TUBITAK.GOV.TR)   | 275 |
| GPGSIM: A NEW SIMULATION ENVIRONMENT FOR INTERNATIONAL POLITICS AND ECONOMICS<br>MUNEYOSHI SAITO, YUTAKA YAMAGUCHI, HIROFUMI YAMAKI, EIZO AKIYAMA, MAKOTO SEJIMA AND KAZUO<br>YOSHIDA (YOSHI@MSI.CO.JP)                                       | 283 |
| SENSITIVITY ANALYSIS FRAMEWORK FOR LARGE AND COMPLEX SIMULATION MODELS<br>GHAITH RABADI, SHANNON BOWLING, CHARLES KEATING AND RESIT UNAL (GRABADI@ODU.EDU)  | 291 |
| HIGH FIDELITY MODELING AND SIMULATION OF SUBMARINE IN A COMMERCIAL COMPUTER<br>GENERATED FORCES TOOLKIT<br><u>MEHMET HAKLIDIR, AHMET FAIK GUVEN, OMER EROGLU, DENIZ ALDOGAN AND ISA TASDELEN</u><br>( <u>MEHMET.HAKLIDIR@BTE.MAM.GOV.TR</u> ) | 299 |
| TRANSDISCIPLINARY INTELLIGENT AGENT CONTROLLED SIMULATION OF CRISIS SITUATIONS  | 307 |

-

ANDRAS JAVOR (JAVOR@EIK.BME.HU)

.

| SIMULATION MODELING ARCHITECTURE (SIMA), A DEVS BASED MODELING AND SIMULATION<br>FRAMEWORK<br><u>AHMET KARA, FATIH DENIZ, DORUK BOZAGAÇ AND MAHMUT NEDIM ALPDEMIR</u><br>( <u>AHMETK@ILTAREN.TUBITAK.GOV.TR)</u> | 315 |
|--|-----|
|  |     |
| SIMULATION AS DECISION SUPPORT FOR THE PLANNING OF ORDER-PICKING-SYSTEMS<br>ALEXANDER ULBRICH, STEFAN GALKA AND WILLIBALD A. GÜNTHNER (ULBRICH@FML.MW.TUM.DE)  | 322 |
| A PLATFORM FOR THE BEHAVIORAL ANIMATION OF CROWDS<br>HAKIM SOUSSI, JOËL SAVELLI AND MARC NEVEU (HAKIM.SOUSSI@U-BOURGOGNE.FR)   | 328 |
| A FULLY DISTRIBUTED DATA COLLECTION METHOD FOR HLA BASED DISTRIBUTED<br>SIMULATIONS  | 337 |
| EMRAH KAYA AND FATIH ERDOGAN SEVILGEN (EMRAHKAYA@GMAIL.COM)  |     |
| TOWARDS AN AUTOMATIC TRANSFORMATION FROM A DEVS TO A SDL SPECIFICATION PAU FONSECA I CASAS (PAU@FIB.UPC.EDU)   | 348 |
| CONCEPTUAL MODELING OF A LARGE SCALE HLA BASED SIMULATION SYSTEM USING CMMS FRAMEWORK  | 356 |
| OGUZ ICOGLU AND OGUZ DIKENELLI (OGUZ.ICOGLU@BTE.MAM.GOV.TR)  |     |
| GUN FIRING SIMULATION ANALYSIS<br>YASEMIN TIMAR, DENIZ ALDOGAN, ÖMER EROGLU, ISA TASDELEN, TOLGA BASTURK AND CEMIL AKDEMIR<br>(YASEMIN.TIMAR@BTE.MAM.GOV.TR)   | 364 |
| EMERGENCY EVACUATION SIMULATION IN ISTANBUL TECHNICAL UNIVERSITY<br>BETUL EKIZOGLU (EKIZOGLU@ITU.EDU.TR)   | 370 |
| COMBINING AGENT-BASED PARTICIPATORY SIMULATION AND TECHNOLOGY ENHANCED<br>LEARNING FOR RODENT CONTROL<br>ABDELHAFID CHADLI, ERWAN TRANVOUEZ AND FATIMA BENDELLA (ERWAN.TRANVOUEZ@LSIS.ORG)                       | 377 |
| TESTING THE WEB3D CONTENT CREATION PIPLINE: A CASE STUDY<br>JOHN RICHARDSON (RICHARDS@SPAWAR.NAVY.MIL)   | 383 |
| NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) ATTACK SIMULATION BASE ON EXPERT SYSTEM<br>EBRU ARSLAN (EARSLAN@MILYAZ.COM.TR)  | 391 |
| MULTI-UNDERSTANDING: A BASIS FOR SWITCHABLE UNDERSTANDING FOR AGENTS<br>TUNCER OREN, LEVENT YILMAZ, MOHAMMAD KAZEMIFARD AND NASSER GHASEM-AGHAEE   | 395 |
| [UKEN.IUNCEK@STMPATICU.CA]   |     |
| SAHINSIM: A FLIGHT SIMULATOR FOR END-GAME SIMULATIONS<br>OZER OZAYDIN AND D. TURGAY ALTILAR (OZAYDINOZ@ITU.EDU.TR)   | 403 |
| ENHANCING DODAF VIEWS INTO AN INFORMATION ASSURANCE ARCHITECTURE FOR THE<br>DIACAP   | 411 |
| IVIANK KOTIN, DEILEK SANDERS AND DREVY HAIVILLION (HAIVILLION @AUBUKIN.EDU]  |     |

| FEDERATED_SIMULATION_OF_NETWORK_PERFORMANCE_USING_PACKET_FLOW_MODELING<br>TURAN DEMIRCI AND SEMIH BILGEN (TDEMIRCI2000@YAHOO.COM)               | 418 |
|---|-----|
| ISTANBUL STRAIT MARINE TRAFFIC SIMULATION<br>FATIH CAMCI, FAHRETTIN ELDEMIR, OZGUR UYSAL AND ILYAS USTUN (FCAMCI@FATIH.EDU.TR)                  | 424 |
| EVALUATION OF FOUR ARTIFICIAL LIGHTING SIMULATION TOOLS WITH VIRTUAL BUILDING<br>REFERENCE<br><u>SHARIFUL SHIKDER (S.H.SHIKDER@LBORO.AC.UK)</u> | 430 |
| ABSNEC - AN AGENT-BASED SYSTEM FOR NETWORK ENABLED CAPABILITIES/OPERATIONS<br>KEVIN NG AND MARK REMPEL (KEVIN.NG@DRDC-RDDC.GC.CA)               | 438 |
| EXPLORING SPATIAL PARTITION FOR PARALLEL SIMULATION OF DEVS-FIRE<br>SONG GUO, XIAOLIN HU AND YI SUN (GUOSONG1079@HOTMAIL.COM)                   | 444 |
| SPECIFYING THE CONTENT OF HUMBLE SOCIAL-SCIENCE MODELS<br>PAUL DAVIS (PDAVIS@RAND.ORG)  | 452 |
| EMERGING M&S CHALLENGES FOR HUMAN, SOCIAL, CULTURAL, AND BEHAVIORAL MODELING<br>ANDREAS TOLK (ATOLK@ODU.EDU)                                    | 462 |
| POTENTIAL TECHNOLOGIES FOR ENGINEERING NETWORK-CENTRIC SIMULATIONS<br>OSMAN BALCI (BALCI@VT.EDU)  | 470 |
| MULTI AGENT MODELING OF SELF ADAPTIVE SYSTEM FOR LARGE SCALE COMPLEX SYSTEMS<br>ALAIN CARDON AND MHAMED ITMI (ITMI@INSA-ROUEN.FR)               | 476 |

.

. . .