

# **2007 1<sup>st</sup> Annual IEEE Systems Conference**

**Honolulu, HI  
9-13 April 2007**



**IEEE Catalog Number:**  
**ISBN:**

**07EX1717**  
**1-4244-1040-1**

# Table of Contents

<b>A Dependable System Considering Interdependence Between Agents .....</b>	<b>1</b>
<i>Keinosuke Matsumoto, Tomoaki Maruo, Akifumi Tanimoto and Naoki Mori</i>	
<b>Applying Real Options to Flexible Systems Engineering: a Proof-Of-Concept Study on Capability Acquisition of Tactical Data Links.....</b>	<b>7</b>
<i>Shin-Jyh Frank Chang and Gary R. Backus</i>	
<b>Understanding Behavior of System of Systems Through Computational Intelligence Techniques .....</b>	<b>14</b>
<i>Cihan Dagli and Nil Kilicay</i>	
<b>Engineering the Enterprise .....</b>	<b>21</b>
<i>George Rebovich, Jr.</i>	
<b>Modeling Information Utility in Systems of Systems .....</b>	<b>27</b>
<i>Philip Barry, Matthew Koehler and Adam Mcleod</i>	
<b>Visualization of Systems of Systems Simulations: 3density Plots and Trajectory Storyboarding .....</b>	<b>33</b>
<i>Matthew Koehler, Ted Meyer, Adam Mcleod, Carl Burke, Sarah Johnson and Philip Barry</i>	
<b>System Evaluation and Description Using Abstract Relation Types (Art) .....</b>	<b>40</b>
<i>Joseph J. Simpson, Cihan H. Dagli and Ann Miller</i>	
<b>Lean Six Sigma for Supply Chain Management as Applied to the Army Rapid Fielding Initiative .....</b>	<b>46</b>
<i>Scott T. Crino, Daniel J. Mccarthy and Julia D. Carier</i>	
<b>Systems-Of-Systems Integration Using a Net-Centric Organization .....</b>	<b>53</b>
<i>Phillip J. West</i>	
<b>Decentralized Reconfiguration for Power Systems Using Multi Agent System.....</b>	<b>58</b>
<i>Kai Huang, Sanjeev Srivastava and David Cartes</i>	
<b>Systems Architecting Heuristics for Systems Engineering Management and Embedded Systems Engineering .....</b>	<b>64</b>
<i>Dr. Cihan Dagli and Mark S. Anderson</i>	
<b>A Control System Test Bed for Demonstration of Distributed Computational Intelligence Applied to Reconfiguring Heterogeneous Systems .....</b>	<b>69</b>
<i>S. K. Srivastava, D. A. Cartes, F. Maturana, F. Ferrese, M. Pekala, M. Zink, R. Meeker, D. Carnahan, R. Staron, D. Scheidt and K. Huang</i>	
<b>A Decentralized State Estimator for Non-Linear Electric Power Systems .....</b>	<b>77</b>
<i>Gabriele D'Antona, Antonello Monti and Ferdinanda Ponci</i>	
<b>Challenges of Integrating Large Amounts of Wind Power.....</b>	<b>83</b>
<i>Jonathan D. Rose, Ian A. Hiskens</i>	

<b>Systems Engineering Approach to Agricultural Automation: New Developments</b> .....	<b>90</b>
<i>Jayantha Katupitiya, Ray Eaton and Tahir Yaqub</i>	
<b>Developing Realtime Business Intelligence Systems the Agile Way</b> .....	<b>97</b>
<i>Supratim Dasgupta and Vamsi Krishna Vankayala</i>	
<b>Assisted Teleoperated Navigation System Based on 3d Mapping</b> .....	<b>104</b>
<i>Andres Mora, David G. Axelson, Marco Chacín, Keiji Nagatani and Kazuya Yoshida</i>	
<b>Synergistic Impacts of Domain-Spanning Conceptual Design on Control of Self-Optimizing Systems</b> .....	<b>110</b>
<i>Jürgen Gausemeier, Ursula Frank, Cheng Yee Low and Christian Henke</i>	
<b>On Interpreting Scale (Or View) and Emergence in Complex Systems Engineering</b> .....	<b>117</b>
<i>Brian E. White</i>	
<b>The Virtual Test Bed as a Tool for Rapid System Engineering</b> .....	<b>124</b>
<i>Roger A Dougal and Antonello Monti</i>	
<b>Multi-Criteria Decision Making and Behavior Assignment in Sensor Networks</b> .....	<b>130</b>
<i>Prasanna Sirdhar, Asad M. Madni and Mo Jamshidi</i>	
<b>Co-Adaptive Behavior Algorithms for Insurgent and Counter-Insurgent Techniques in Combat Simulations</b> .....	<b>137</b>
<i>Robert Kewley, Paul Richmond and Niki Goerger</i>	
<b>When Legacy Meets SOA: Achieving Business Agility By Integrating New Technology With Existing Software Asset</b> .....	<b>144</b>
<i>Pasquale Iocola</i>	
<b>Techniques for Disaster Tolerant Information Technology Systems</b> .....	<b>152</b>
<i>Chad M. Lawler, Stephen A. Szygenda and Mitchell A. Thornton</i>	
<b>Optimizing Seismic Survey Design and Processing Flows: a Fast Tree Search Using the Van Trees Inequality</b> .....	<b>158</b>
<i>Max Deffenbaugh</i>	
<b>Intelligent Network Infrastructure Systems Architecture and Integration, Risk Management and Validation</b> .....	<b>165</b>
<i>Emmanuel Hooper</i>	
<b>A Hybrid Approach to Modeling Soa Systems of Systems Using Cpn and Mesa/Extend</b> .....	<b>172</b>
<i>Elliot Sloane, Thomas Way, Vijay Gehlot, Robert Beck, James Solderitch and Elzbieta Dziembowski</i>	
<b>Conceptual Sos Model and Simulation Systems for a Next Generation National Healthcare Information Network (Nhin-2): Creating a Net-Centric, Extensible, Context Aware, Dynamic Discovery Framework for Robust, Secure, Flexible, Safe, and Reliable Healthcare</b> .....	<b>179</b>
<i>Elliot Sloane, Thomas Way, Vijay Gehlot and Robert Beck</i>	

<b>An Engineering Systems Perspective on System of Systems Methodology .....</b>	<b>185</b>
<i>Marcus Bjelkemyr, Daniel Semere and Bengt Lindberg</i>	
<b>System and Load Points Reliability Evaluation for Electric Power Systems.....</b>	<b>192</b>
<i>Ching-Tzong Su, Ji-Jen Wong and Chi-Jen Fan</i>	
<b>Coordination By Correlation: Mission Planning and Control Based on Collaboration and Collision Maps.....</b>	<b>199</b>
<i>Wolfgang Meyer</i>	
<b>Integration By Synchronization: Logistics Planning and Control Based on Petri Nets.....</b>	<b>204</b>
<i>Claudia Fiedler</i>	
<b>Framework for Requirements-Driven System Design Automation.....</b>	<b>211</b>
<i>Ionut Cardei, Mihai Fonoage and Ravi Shankar</i>	
<b>Taking a Systematic Approach to the United States Military Academy Systems Engineering Program .....</b>	<b>218</b>
<i>Scott Brown, Jeffrey Cho, Nathan Collier, Nicholas Hill and Michael J. Kwinn Jr.</i>	
<b>The Changing Role of the Systems Engineer in a System of Systems (Sos) Environment.....</b>	<b>225</b>
<i>David D. Walden</i>	
<b>Leading Effective System of Systems (Sos) Technical Reviews (A Half-Day Tutorial) .....</b>	<b>231</b>
<i>David D. Walden</i>	
<b>Disaster Tolerant Systems Engineering for Critical Infrastructure Protection .....</b>	<b>233</b>
<i>Michael A. Harper, Mitchell A. Thornton and Stephen A. Szygenda</i>	
<b>The System Shell as a Construct for Mitigating the Impact of Changing Contexts By Creating Opportunities for Value Robustness.....</b>	<b>240</b>
<i>Adam M. Ross and Donna H. Rhodes</i>	
<b>An Integrated Methodology for Qos Driven Reusable Component Design and Component Selection .....</b>	<b>247</b>
<i>Ankur Agarwal, Georgiana Hamza-Lup, Ravi Shankar and James Ansley</i>	
<b>Design Principles for Survivable System Architecture .....</b>	<b>254</b>
<i>Matthew G. Richards, Adam M. Ross, Daniel E. Hastings and Donna H. Rhodes</i>	
<b>Test Driven Design Challenges for Faster Product Development.....</b>	<b>263</b>
<i>Jason Fraser and Baldev S. Mattu</i>	
<b>Test Driven Design Methodology for Componentbased System .....</b>	<b>268</b>
<i>Baldev S. Mattu and Ravi Shankar</i>	
<b>Unified Test Environment-Integrated Platform for Bridging the Modeling, Testing and Code Development Flow .....</b>	<b>275</b>
<i>Jongpil Choi, Sifat Islam and Ravi Shankar</i>	

<b>Radical Productivity Improvement With One Pass to Production (Opp)</b> .....	<b>282</b>
<i>Ravi Shankar and Jaime Borrás</i>	
<b>Fault-Tolerant Verification Platform for Systems Modeled At High Level of Abstraction</b> .....	<b>289</b>
<i>Yung-Yuan Chen and Geng-Wei Wu</i>	
<b>Engineering for Systems Assurance ... a State of the Practice Report</b> .....	<b>296</b>
<i>Paul R. Croll</i>	
<b>Macro Systems: Adopting a Coherent Top-Down Framework in Undergraduate Engineering Courses</b> .....	<b>303</b>
<i>Stephen A. Dyer and John L. Schmalzel</i>	
<b>Emotional Reliability Design: Human Driven and System Supported Approach</b> .....	<b>308</b>
<i>Shuichi Fukuda</i>	
<b>Algorithmic Approaches to Reducing Risk .In Power System Operation</b> .....	<b>314</b>
<i>Laurence R. Phillips</i>	
<b>Experiences in Large-Scale, Component Based, Model-Driven Software Development</b> .....	<b>321</b>
<i>Mohamad Foustok</i>	
<b>Lessons Learned on Five Large-Scale System Developments</b> .....	<b>329</b>
<i>Nathaniel Ozarin</i>	
<b>Findings of Case Studies in Enterprise Systems Engineering</b> .....	<b>336</b>
<i>Kimberly A. Crider and Joseph K. Derosa</i>	
<b>Combined Systems Engineering and Management in the Evolution of Complex Adaptive Systems</b> .....	<b>342</b>
<i>Joseph K. Derosa and L. Keith Mccaughin</i>	
<b>Towards Strategic Design Reuse By Leveraging Commonality and Managing Variability</b> .....	<b>350</b>
<i>Shihong Huang, Ravi Shankar and Jan Mangs</i>	
<b>Real Options and Flexibility in Organizational Design</b> .....	<b>354</b>
<i>John W. Dahlgren and Michael S. Cokus</i>	