

Mini Track: 'VEAM: Virtual Environments for Analytical Modeling'

Mini Track Chairs:

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For the past five years, leading researchers from all over the world have met in different venues to present and discuss recent advances in the area of virtual environments and analytical modeling. In the beginning, we were primarily interested in how to build large, complex analytical models using distributed teams, but gradually the topic space has enlarged to embrace the larger theme of "virtual worlds" and the role of operations research and management science in this context. An IFIP meeting was held just a few days prior to this HICSS and we felt it would be useful for the HICSS audience to see what we have been doing.

The nine papers in this Minitrack are arranged in three different clusters corresponding to logistics and supply chain management, telecommunications, and knowledge science respectively.

The paper by M. Jarke, Michalis Miatidis, Marcus Schlüter and Oliver Fritzen, *Media-Assisted Product and Process Traceability in Supply Chain Engineering*, tackles the issue of design traceability for supply chain situations which are both product-oriented and process-oriented. Their approach employs both innovative media-based usage for evaluation of product alternatives and reuse of analysis process experiences to avoid previous mistakes.

R. Schleiffer, H-J Sebastian, F. Golm, N. Kapoustina, *Application of Genetic Algorithms for the Design of Large Scale Reverse Logistic Networks in Europe's Automotive Industry*, combines the methods of reverse supply-chain-management with operations research modeling techniques to find solutions to the problem of recovering and recycling end-of-life vehicles in Europe.

The paper by D. Woodruff and S. Voss, *A Model for Multi-Stage Production Planning with Load Dependent Lead Times*, considers the crucial tradeoffs that occur in the process of converting from individual production processes to integrated supply chains. They develop a planning model for this problem which can be solved with off the shelf integer programming software.

The second cluster of papers deals with the telecommunications application domain. The first paper by A. Wierzbicki and J. Granat; *Multi-criteria Analysis in Telecommunications*, presents an overview of multi-criteria analysis techniques applied to the design of telecommunication networks. They show an example of how multi-criteria analysis might be used by diverse players in negotiating of interconnection agreements.

Z. Pawlak's *Decision Algorithms and Flow Networks* presents a new mathematical model of a flow network, intended to be used with decision processes rather than as a tool for flow optimization in networks. Branches of the network are interpreted as decision rules with elementary conditions and decisions in the nodes, whereas the whole network represents a decision algorithm.

The final paper in the telecommunications cluster, Bordetsky, Hutchins, Kemple, Bourakov, *Network Awareness for Wireless Peer-to-Peer Collaborative Environments*, explores the effects of wireless P2P network behavior awareness on the performance of collaboration support applications. Results achieved during an experiment demonstrate significant effects of roaming on application sharing performance and integration with client-server applications.

The final three papers deal with area of knowledge science. Y. Nakamori; *Systems Approach to Knowledge Integration* is a conceptual piece which lays out the fundamental principles of knowledge science, and shows their relationship to the discipline of systems science. A new systems methodology for knowledge management and creation is proposed, which integrates knowledge in the scientific, creative and social dimensions.

Y. Shinoda and Y. Nakamori; *Studies on Rule Learning in Gaming Situations* takes a preliminary look at how agents must be configured in order to predict other agents' behavior in a zero-sum game. The authors suggest how to build agents with interior mental models. Specifically, each agent has its own neural-networks for predicting the behavior of other agents and a classifier model for tactical decision-making.

Terano and Naitoh; *Agent-Based Modeling for Competing Firms: From Balanced-Scorecards to Multi-Objective Strategies* integrates agent-based modeling, genetic algorithms and tabu search in the quest for determining optimal marketing strategies in specific markets. The authors model competing companies with the Balanced Scorecard approach to examine their Value Proposition strategies for customers. They then design decision making agents or competing companies with strategic parameters to be optimized; employ a multi-objective optimization framework with Genetic Algorithms to evolve the artificial simulated society, and then validate the strategic parameters of the agents after simulation via statistical analysis of the individual genes.