INDIN'06

2006 IEEE International Conference on Industrial Informatics

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Integrating Manufacturing and Services Systems
Program & Abstracts

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Analysis of the set of all cycles in a reachability graph of a system could bring new and useful insight into the system's behavior. This paper presents a method for computation of all cycles in a reachability graph. The method is based on structural reduction of the state space, followed by an encoding - decoding procedure applied to the reduced set of states. The proposed approach is believed to be beneficial with respect to memory constraints.

TPC1E.4   Collective Approach for Repair time Analysis

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Machine downtime can be defined as a total amount of time the machine would normally be out of service from the moment it fails until the moment it is fully repaired and back to operate. Once a unit experiences a service downtime or downgrade, the covariates or risk factors can directly impact on the delay in repairing activities. Our study reveals the model to identify the potential risk factors that either delay or accelerate repair times, and it also demonstrates the extent of such delay, attributable to specific risk factors. Once risk factors are detected, the maintenance planners and maintenance supervisors are aware of the starting and finishing points for each repairing job due to their prior knowledge about the potential barriers and the facilitators. There are not many sufficient studies made on the application of artificial intelligence techniques to access troubleshooting activities as it always taken into consideration in a verbal sense and yet is not dealt with mathematically. The proposed study extended Choy, John, Thomas & Yan [1] models using either semi-parametric or non-parametric approaches of reliability analysis to examine the relationship between repair time and various risk factors of interest. Then the models will be embedded to neural networks to provide better estimation of repairing parameters. The proposed models can be used by maintenance managers as a benchmarking to develope quality service to enhance competitiveness among service providers in corrective maintenance field. Also the models can be deployed farther to develop a computerized decision support system.

TPC1E.5   Network-based Support System for Decentralized Scheduling of Distributed Production Systems through Man-Machine Collaboration

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University of Miyazaki

In these days, many production systems are consist of several "production base" and such bases are distributed in wide area. And they also form "Production Networks" such that each plant/factory produces intermediate materials of parts for other plants/factories. In order to operate such production networks efficiently, it is indispensable that some rational and sound operational strategy for realizing cooperative operation. In this work, "Behaviour Model" of scheduling activities in decentralized production networks was developed and the validity was confirmed. Next, a network-based support system for decentralized scheduling of distributed production systems through man-machine collaboration was developed based on the model together with the concept of "Remote Schedulin". A series of experiments were carried out in order to confirm that the model production system managed under the behaviour model could keep sound operations.

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16–18 August 2006
Grand Copthorne Waterfront Hotel, Singapore

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Tuesday, 15-Aug-2006

09:00–17:00		
Kingfisher Room, Level 4	**Tutorial I: Designing Robust Wireless Communications for Factory Floors**, *Dr. P.S. Neelakanta, C.Eng., Fellow IEE,* *Professor of Department of Electrical Engineering,* Florida Atlantic University, USA	
Pelican Room, Level 4	**Tutorial II: Decision Support Systems/Intelligent Maintenance Systems for Manufacturing and Design,** *Dr. Ashraf Labib, Fellow IEE, Fellow ORS, and C. Eng* *Professor of Operations and Decision Analysis,* Department of Strategy and Business Systems (SBS), Portsmouth Business School (PBS), University of Portsmouth, UK	
Toucan Room, Level 4	**Tutorial III: Service-oriented Architectures in Industrial Automation** *Harm Smit, Schneider Electric,* Science & Technology Department, Grenoble, France *Ivan M. Delamer,* Institute of Production Engineering, Tampere University of Technology, Tampere, Finland	

Date	Time	Riverfront Ballroom — Riverfront I	Riverfront II	Riverfront III	Waterfront I	Penguin
Wednesday, 16-Aug-2006	08:30 – 09:00	Opening Ceremony				
	09:00 – 10:00	Keynote — Integration of Manufacturing and Service Systems — Prof Lord Bhattacharyya, Warwick Manufacturing Group at The University of Warwick, UK				
	10:00 – 10:30	Coffee Break				
	10:30 – 12:30	TPC3A Distributed, Embedded and Networked Control	IS02 RFID Technology and its Applications	TPC1A Collaborative Manufacturing and Service System	TPC2A Ubiquitous Sensors/actuators network	IS03 Pervasive Computing in Industry Applications
	12:30 – 13:30	Lunch				
	13:30 – 15:30	TPC3B Distributed, Embedded and Networked Control	TPC5A Intelligent Performance Management	TPC2B Ubiquitous Sensors/actuators network	TPC1B Collaborative Manufacturing and Service System	TPC4A Service-Oriented Architecture
	15:30 – 15:50	Coffee Break				
	15:50 – 18:10	SS01 Information Technology and Energy	TPC6A Emerging Trends of Industrial Informatics	TPC8A Supply Chain Management and Logistics	TPC4B Service-Oriented Architecture	TPC1C Collaborative Manufacturing and Service System
Thursday, 17-Aug-2006	08:30 – 09:30	Keynote — Service Oriented Architecture (SOA) in Industrial Systems — Professor Norihisa Komoda, Graduate School of Information Science and Technology Osaka University, Japan				
	09:30 – 10:30	Keynote — Emerging Technologies and Paradigms - an Emerson perspective — Dr. Randall D. Ledford, Senior Vice President & Chief Technology Officer, Emerson Electric Co, USA				
	10:30 – 11:00	Coffee Break				
	11:00 – 13:00	SS04 Product Lifecycle Management	TPC7A Information Security & Trust for Industrial Systems	TPC4C Service-Oriented Architecture	SS02A Wireless Sensor Network Technologies and Applications	TPC3C Distributed, Embedded and Networked Control
	13:00 – 14:00	Lunch				
	14:00 – 16:00	SS03A Cooperative Intelligent Information Services	IS01 Software Focused Supply Chain Optimization	TPC8B Supply Chain Management and Logistics	IS04A Optical Sensing Technology and Robot Motion Control	TPC5B Intelligent Performance Management
	16:00 – 16:20	Coffee Break				
	16:20 – 18:20	TPC3D Distributed, Embedded and Networked Control	TPC1D Collaborative Manufacturing and Service System	TPC7B Information Security & Trust for Industrial Systems	IS04B Optical Sensing Technology and Robot Motion Control	SS02B Wireless Sensor Network Technologies and Applications
Friday, 18-Aug-2006	08:30 – 09:30	Keynote — Recent Advances and Future Trends in Advanced Prognostics for Smart Machines and Product Service Systems — Professor Jay Lee, Director of NSF Industry/University Cooperative Research Center on Intelligent Maintenance Systems (IMS), University of Cincinnati, USA				
	09:30 – 10:30	Keynote — Autonomous Systems for Flexible Manufacturing: Successes and Challenges — Dr. Sujeet Chand, Senior Vice President & Chief Technology Officer, Rockwell Automation, USA				
	10:30 – 11:00	Coffee Break				
	11:00 – 13:00	SS03B Cooperative Intelligent Information Services	TPC5C Intelligent Performance Management	IS04C Optical Sensing Technology and Robot Motion Control	TPC8C Supply Chain Management and Logistics	
	13:00 – 14:00	Lunch				
	14:00 – 16:00	TPC3E Distributed, Embedded and Networked Control	TPC5D Intelligent Performance Management	IS04D Optical Sensing Technology and Robot Motion Control	TPC1E Collaborative Manufacturing and Service System	
	16:00 – 16:20	Coffee Break				
	16:20 – 18:20	TPC6B Emerging Trends of Industrial Informatics	TPC5E Intelligent Performance Management	IS04E Optical Sensing Technology and Robot Motion Control		

Conference Registration

Date	Time	Venue
15 Aug 2006	16:00 – 19:00	Foyer of Riverfront Ballroom, Grand Copthorne Waterfront Hotel, Level 2
16 Aug 2006	07:00 – 15:00	Foyer of Riverfront Ballroom, Grand Copthorne Waterfront Hotel, Level 2
17 – 18 Aug 2006	08:00 – 12:00	Foyer of Riverfront Ballroom, Grand Copthorne Waterfront Hotel, Level 2

Welcome Reception

Date	Time	Venue	Dress Code
15 Aug 2006	18:30 – 21:00	The Promenade, Grand Copthorne Waterfront Hotel, Level 1	Smart casual

Gala Banquet Dinner

Date	Time	Venue	Dress Code
17 Aug 2006	19:00 – 22:00	Grand Ballroom I, Grand Copthorne Waterfront Hotel, Level 4	Smart casual