

7th IFAC International Conference on Fieldbuses and Networks in Industrial and Embedded Systems 2007

**Toulouse, France
7-9 November 2007**

ISBN: 978-1-60560-741-2

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.

Copyright© (2007) by the International Federation of Automatic Control (IFAC)
All rights reserved.

Printed by Curran Associates, Inc. (2009)

For permission requests, please contact the publisher, International Federation of Automatic Control (IFAC)
at the address below.

IFAC Secretariat
Schlossplatz 12
A-2361 Laxenburg
Austria

Phone: +43 2236 71 447
Fax: +43 2236 72 859

secretariat@ifac-control.org

TABLE OF CONTENTS

Exploiting Spatial Diversity in Wireless Industrial Networks	1
<i>Andreas Willig</i>	
Centralized Control of Wireless Sensor Networks for Real-Time Applications	11
<i>Jianping Song, Song Han, Aloysius K. Mok</i>	
Planning Available WLAN in Dynamic production Environments	19
<i>Svilen Ivanov, Edgard Nett, Stefan Schemmer</i>	
Impact of the Operating System on the QoS offered by an IEEE 802.15.4 – compliant Sensor Network	27
<i>Mangesh Chitmis, Paolo Gai, Giuseppe Lipari, Poalo Pagano, Antonio Romano</i>	
Evaluation of UWB Communication for in-flight Entertainment System in the Aircraft Cabin	35
<i>Roxana Albu, Aubin Lecointre, Daniela Dragomirescu, Thierry Gayraud, Pascal Berthou</i>	
Embedded Networks in Airbus Avionics	43
<i>Nathalie Courmont, Juan Lopez</i>	
On-board Data Links and Networks in Space Applications	43
<i>Olivier Notebaert</i>	
Extended Networks in Automotive Transportation	43
<i>Jean-Luc Mate</i>	
Networked Control Systems with Information Recovery over Profibus-DP	44
<i>Vicente Casanova, Julian Salt, Angel Cuenca, Ricardo Piza</i>	
A Deterministic Wireless Network for Feedback Control based on IEEE 802.15.4	52
<i>Donggil Kim, Seawood Park, Kyungmin Kang, Dongik Lee</i>	
Network-Induced Delay Models for CAN based Networked Control Systems	57
<i>Rodrigo Vargas-Rodriguez, Ruben Morales-Menedez</i>	
Sliding Time Interval based MAC Protocol and its Temporal Validation	65
<i>K. Godary, D. Andreu, G. Souquet</i>	
Using Priority Inheritance Techniques to override the size limit of CAN messages	73
<i>Cesare Bartolini, Giuseppe Lipari, Luis almeida</i>	
Classification and Analysis of Failure Modes for Time-Triggered Systems	81
<i>Maria Sorea, Wilfried Steiner</i>	
On-board Diagnosis Systems for Intermittent Fault : Application in Automotive Industry	89
<i>Siegfried Soldati, Michel Combacau, Audine Subias, Jerome Thomas</i>	
A Generic Simulation Model for End-to-End Delays Evaluation on an Avionics Switched Ethernet	97
<i>Jean-Luc Scharbarg, Christian Fraboul</i>	
Virtual Automation Networks. Topology and System Architecture	105
<i>Peter Neumann, Axel Poschmann</i>	
Hybrid Wired/Wireless PROFIBUS Architectures: Comparative Performance Analysis in Error-Prone Environment	111
<i>Paulo Baltarejo Sousa, Luis Lino Ferreira</i>	

A Concept for the System Integration of Wireless Sensor Networks to Industrial Automation Systems using PROFINET	119
<i>Henning Trsek, Juergen Jasperneite, Gunnar Lessmann</i>	
Security Optimization for Agent Platforms and Reducing Turnaround Time for Mobile Agents	126
<i>Najmus Saquib Malik, Albert Treytl</i>	
Performance Analysis and Improvement of ZigBee Routing Protocol	132
<i>Bilel Nefze, Ye-Quiong Song</i>	
Prototyping and Performance Analysis of a QoS MAC Layer for Industrial Wireless Network	140
<i>Adrien vand den Bossche, Thierry Val, Eric Campo</i>	
Beacon Synchronization for GTS Collision Avoidance in an IEEE 802.15.4 Meshed Network	147
<i>Jackson Francomme, Gilles Mercier, Thierry Val</i>	
AES-CCM Implementation for the IEEE 802.15.4 Devices	155
<i>Miguel Leon-Chavez, Francisco Rodriguez Henriquez, Emmanuel Lopez Trejo</i>	
A Diagnosis Strategy for FDI in Wireless Networked Control System	162
<i>C. Berbra, Z.H. Khan, S. Gentil, S. Leseq, J.M. Thieriet</i>	
Limits of Performance of Adaptive Variable-Window CSMA	168
<i>Marek Miskowicz</i>	
A Safe and Efficient Protocol for Oasis-Based Distributed Safety-Critical Real-Time Systems	174
<i>Damein Chabrol, Jean-Sylvain Camier, Vincent David, Christophe Aussagues</i>	
Timed Analysis of Embedded Networks using Timed Automata	178
<i>Jerome Ermont, Jean-Luc Scharbarg, Christian Fraboul</i>	
Wireless Metropolitan Area Networks for TeleMonitoring Applications	184
<i>Javir Silvestre, Victor Sempere, Teresa Albero</i>	
Probabilistic Real-Time Data Fusion in Wireless Sensor Networks with ZigBee	188
<i>A.R. Pinto, Benedito R. Bitencort, Underlea C. Correa, M.A.R. Dantas, Carlos Montes</i>	
A Multi-Sensory, Symbolic, Knowledge-based Model for Humanlike Perception	194
<i>Rosemarie Velik, Gerhard Pratl, Roland Lang</i>	
Implementation of an Event Triggered Smart Sensor Network Architecture Based on the IEEE 802.15.4 Standard	200
<i>Enrico Meneses Leao, Luiz Alffonso Guedes, Francisco Vasques</i>	
FDI – The Future of Open Device Integration	206
<i>Benjamin Danzer, Daniel Grobmann</i>	
Modeling of Substation Architecture Implementing IEC 61850 Protocol and Solving Interlocking Problems	212
<i>M. Haffar, J.M. Thiriet, E. Savary</i>	
A Secure Proxy Solution for Profinet IO as a Migration Strategy for Existing Automation Solutions	216
<i>Robert Lehmann, Martin Wollschlaeger, Frank Iwanitz</i>	
Biped Robot Monitoring using a C.A.N. – WiFi Bridge	220
<i>V. Nicolau, M. Albero, J.F. Blanes, J.E. Simo</i>	
Scenario Recognition in Modern Building Automation	224
<i>R. Lang, D. Bruckner, G. Pratl, R. Velik, T. Deutsh</i>	

Netcarbench: A Benchmark for Techniques and Tools used in the Design of Automotive Communication Systems	232
<i>Christelle Braun, Lionel Havet, Nicolas Navet</i>	
Socket-Based CAN Support for Embedded Operating Systems	240
<i>Gianluca Cena, Ivan Cibrario Bertolotti, Luca Ferreri, Adriano Valenzano</i>	
Wide-Area Control System for Balance-Energy Provision by Energy Consumers	248
<i>Friederich Kupzog, Peter Palensky</i>	
Secure Ultrasonic Localization and Authentication for Sensor Networks	257
<i>Herbert Schweinzer, Georg Kaniak</i>	
A Location-Unaware Distributed Clustering Algorithm for Mobile Wireless Sensor Networks Using Fuzzy Logic	265
<i>S. Nourizadeh, Y.Q. Song, J.P. Thomesse</i>	
Author Index	