

**Report by the NOC and IPC Chairs
for INCOM 2012**

A. TITLE AND DATE OF THE MEETING

Title of Meeting INCOM'12 14th IFAC Symposium Information Control Problems in Manufacturing
Meeting Date May 23-25, 2012
Location Hilton Hotel Conference Centre, Bucharest, Romania

B. ORGANIZATION

NOC CHAIR:
Theodor BORANGIU

IPC CHAIR:
Alexandre DOLGUI

Name of IPC Vice Chair
Ioan DUMITRACHE, Carlos Eduardo PEREIRA

Name of IPC Vice Chair from industry
Pavel VRBA company Rockwell Automation, Czech Republic

Name of Editors
Theodor BORANGIU, Alexandre DOLGUI, Ioan DUMITRACHE, Florin FILIP,

G. OVERALL ASSESSMENT

Scientific Output of event:

Adequacy of papers to meeting scope:

INCOM'12 has proved that the community of Manufacturing Systems, Information and Control Systems, Supply Chains and Logistics within IFAC is very numerous, expanding and preoccupied for the progress of science and technological transfer to industry. The papers submitted were of excellent quality and exceedingly interesting. With few exceptions, all received papers were in the scope of INCOM, expressed in its declared scientific topics (see the home page <http://www.incom12.ro>) updated according to the current technology reality and R&D trends. The accepted papers reflected the main Information Control problems specific for the integration of the Manufacturing Plant Control domain within the broader Networked Enterprise area. A large number of scientists affiliated to IFAC and traditionally collaborating with other world wide scientific associations (IFIP, IFORS, IMACS, IFToMM, GdR-MACS) were also present.

Highlights of event with respect to technical and scientific contributions:

Leading scientists from academia, developers and integrators of automation and information systems and manufacturing solutions as well as innovators in the field of Manufacturing and Logistics Systems and Mechatronics, Robotics and Components were present at INCOM 2012 IFAC Symposium. The regular presentations were completed by keynote speeches held by well known European and American scientists. A brief report of results at a glance is available at the web site <http://www.incom12.ro>. There was a unanimous appreciation of all participants at the INCOM'12 event on the exceptional scientific and technical level of papers presented and the quality of selection (the selection rate for Proceedings is 69.9% of submissions).

Technical Trends:

INCOM'12 has gathered in large the communities of: (1) Manufacturing Control, Information Systems and Interoperability, (2) Operational Research and (3) Industrial Engineering. Manufacturing Systems with Distributed Intelligence (Intelligent Products and Product Lifecycle Management, Service Orientation in Manufacturing, Holonic and Multi-Agent Technologies, Distributed Intelligence and Semi-heterarchical Information Control Topologies, Service Oriented Manufacturing Enterprise Architectures) for Agile and Sustainable Manufacturing Plant Control, analysed and discussed in detail during INCOM'12, still remains an important topic of INCOM and is impacting distributed control and networked enterprise systems. INCOM'12 was the event where some new, emergent trends were validated: (1) Vertical integration of the enterprise business layer and shop floor technical layer by means of Manufacturing Integration Framework (MIF) based on Manufacturing Service BUS MSB 2.0 SOA; (2) Service Oriented Architectures within automation; (3) New information control topologies with Distributed Intelligence for myopia reduction and manufacturing sustainability; (4) Bio-inspiration for MES design and implementing; (5) Enterprise systems redesign for Interoperability and Service Orientation. Application of sophisticated optimization methods, algorithms and tools in production control, management and logistics, including: multi-objective optimization, service value chain, reconfigurable manufacturing systems, model-based system engineering and dependability modelling, and e-production are new lines of future research and development. Confirming a 6-year evolution, the Petri nets field applied to manufacturing is in continuous decline because of the increasing impact of agent orientation and automation object-oriented techniques which are raising new challenges for dependable control discrete systems and systems engineering.

Outstanding Ideas Presented:

Some of the new, outstanding ideas presented at INCOM'12 are: (i) A new paradigm of Intelligent Product based on Distributed Intelligence (DI) in manufacturing, also leading to solutions for Product-driven Automation; (ii) A new paradigm of reconfigurable manufacturing systems (RMS) based on resource performance monitoring; (iii) New approaches of data mining for design of product and production systems; (iv) New approaches for mixing production planning with product scheduling and resource allocation for batch optimization; (v) New approaches for dynamic mode switching in semi-heterarchical control systems for myopia reduction and agility; (vi) Novel approaches of e-work and information systems interoperability; (vii) New approaches for monitoring power footprint of equipment for manufacturing sustainability and preventive maintenance; (viii) New approaches for Human-Robot Interaction (HRI) and Coordination for dexterous task reproducing in manufacturing.

Other comments:

INCOM 2012 focused both on strategic R&D lines in manufacturing control and logistics, and on real problems of design, deployment and operations management in manufacturing systems. The IPC assured high-quality scientific expertise during the stages of tracks and sessions proposal, paper evaluation, definition of the Symposium structure and awarding the best papers. The participation was very good (436 attendees including 61 industrial representatives). The organization and logistics were excellent, the large industrial participation and exhibitions offered wonderful opportunity to explore and compare the latest innovations.

This event was exceptional from all points of views and reinforces the reputation of IFAC as a leading scientific association worldwide.

H. REPORT FOR NEWSLETTER

Giving highlights, keynote/plenary speakers, news in the field.

See: http://www.ifac-control.org/newsletter_archives



The 14th Triennial IFAC Symposium on “Information Control Problems in Manufacturing” (INCOM’12) was held in the Conference Centre of the Hilton hotel in Bucharest, Romania on May 23–25, 2012. The event was organized by the University Politehnica of Bucharest and the Centre of Research in CIM and Robotics CIMR of Bucharest (General Scientific Chair Professor Laszlo Monostori from the Hungarian Academy of Sciences and Chair of IPC Professor Alexandre Dolgui from Ecole des Mines de Saint-Etienne, France). This INCOM’12 Symposium was again scientifically supported by IFAC CC5–Manufacturing & Logistics Systems with main scientific sponsor the TC5.1 – Manufacturing Plant Control, and by other 9 IFAC Technical Committees: TC1.3, TC2.4, TC4.2, TC4.3, TC4.5, TC5.2, TC5.3, TC5.4 and TC9.2.

Other scientific worldwide or national organizations scientifically co-sponsored INCOM'12: IFIP, IFORS, IMACS, IFToMM, the French organization GdR-MACS (and its IMS2 group) and the IEEE Romania section. The local partnership for INCOM'12 organization was provided by national public institutions and organizations: the National Authority for Scientific Research (ANCS), the Romanian Academy, the General Association of Engineers in Romania (AGIR), the Romanian Society for Automation and Industrial informatics (SRAIT – representing the IFAC NMO Romania), the Robotics Society of Romania (SRR) and the General Confederation of the Romanian Employers (UGIR 1903).

The main Sponsor of INCOM'12 was IBM Romania. Other private companies co-sponsored financially the event: East Electric, Microsoft Romania, Net Brinel, TeamNet International Romania, ASTI Control, SIS, ElectroSoft, Computer Sharing Bucharest, and S_IND Process Control.

INCOM'12 gathered 436 participants (including 61 industrial representatives) from 41 countries (47 countries were represented via authors and participants). The Symposium emphasized the challenges arising from new paradigms of Distributed Intelligence in Manufacturing, Manufacturing Integration Framework, Metaheuristics for production line design and optimization, Service Oriented Enterprise Architectures, Intelligent integrated maintenance and quality strategies, Cognitive and collaborative IT for robot integration in manufacturing and services. New frameworks, design methods and implementing solutions for agile, interoperable production structures which can be integrated in networks were approached for the perspective of the Intelligent Factory of the Future. INCOM'2012 covered three main scientific areas: (i) Control, Information Systems and Interoperability, (ii) Operational Research and (iii) Industrial Engineering. The Symposium was both a scientific and industrial success; 36 firms presented their solutions and services linked to INCOM key issues in industry-oriented technical sessions and a 3-day "Industry and Service Innovation" exhibition.

The INCOM'12 IFAC Symposium offered a high-quality technical program to the participants. The technical program was structured in 15 main Scientific Tracks with 64 Special Sessions, 6 plenary talks, 6 keynote talks, one Industry Track with 6 Innovation Sessions, and one TC5.1 MES Benchmarking Workshop. The plenary speakers were: Prof. Stephen C. Graves from the Massachusetts Institute of Technology USA, Prof. Andrew Kusiak from the University of Iowa USA,

Prof. Ronald Askin from the Arizona state University USA, Prof. Duncan McFarlane from the University of Cambridge UK, Dr. Pavel Vrba from Rockwell Automation Czech Rep., and Prof. George Chryssolouris from the University of Patras Greece. The keynote speakers were: Prof. Benoit Montreuil from the Laval University of Quebec Canada, Dr. Cristina Morariu from IBM Romania, Dr. Hector David Puyosa Piña from SABIC Cartagena Spain, Prof. Marco Ceccarelli from LARM, the University of Cassino Italy, Christoph Legat from Siemens AG Germany and Prof. Alexandre Dolgui from Ecole des Mines de Saint-Etienne France.

INCOM 2012 in Numbers:

- 93 leading scientists from 30 countries in the IPC;
- 492 received papers;
- 550 reviewers participated in the peer review process;
- 1650 reviews received (with a minimum of 3 reviews per paper);
- 344 papers accepted after the peer review process (acceptance rate: 69.9%);
- 12 invited plenary and keynote speakers;
- 38 industrial presentations and 24 industrial exhibitors;
- 2186 pages of the Preprints;
- 19 prizes for the best track paper (16) and the best industrial papers (3) presented;
- 300 selected papers and 9 keynote papers will be published by Elsevier Science in the Symposium Proceedings on [IFAC-PapersOnLine.net](http://www.ifac-papersonline.net) (<http://www.ifac-papersonline.net/cgi-bin/links/page.cgi>).

The main objective for the organizers of INCOM'12 was to put in evidence industrial problems and major needs and invite all representative actors in Automatic Control, Computer Science, Management Science, Operational Research and Industrial Engineering to propose approaches, methods, solutions and tools. This collaborative philosophy, which bridges the gaps between theory, design, implementing and deployment in an interdisciplinary approach, makes INCOM12 the major scientific and industrial event in manufacturing sciences this year. For more information see: <http://www.incom12.ro>

I. SUBMISSION OF REPORT

Alexandre DOLGUI (INCOM'12 IPC Chair) and Theodor BORANGIU (INCOM'12 NOC Chair)

Date: June 8, 2012