

**CoDIS**  
**COLLABORATIVE NETWORKS AND**  
**DISTRIBUTED INDUSTRIAL SYSTEMS**  
**GROUP**

**SUMMARY OF ACTIVITIES**  
**2007**

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# 1. ORGANIZATION

## 1.1 Affiliation

From the institutional point of view, the Collaborative Networks and Integrated Manufacturing unit is part of both the New University of Lisbon (UNL), Faculty of Sciences and Technology, and UNINOVA - Institute for the Development of New Technologies.

At UNL the unit is integrated in the Department of Electrical Engineering. At UNINOVA the unit is integrated in the Center for Intelligent Robotics.

The activities described in this report were carried on in the two institutions.

## 1.2 Members

### Research team:

- ◆ Prof. Luis M. Camarinha-Matos – Group Coordinator [cam@uninova.pt](mailto:cam@uninova.pt)  
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- ◆ Dr. José Barata Oliveira – Auxiliary Professor [jab@uninova.pt](mailto:jab@uninova.pt)
- ◆ Dr. António Abreu – Auxiliary Professor (since Mar 07) [ajfa@mail.fct.unl.pt](mailto:ajfa@mail.fct.unl.pt)
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## 1.3 Contact

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## 2. RESEARCH ACTIVITIES

### 2.1 Research Topics

Current research activities include the following main topics:

- ❑ Collaborative Networks
  - Virtual enterprises / Virtual organizations
  - Virtual communities
  - VO Breeding environments
- ❑ Multi-Agent Systems in Manufacturing and Elderly Care
- ❑ Remote supervision in distributed systems
- ❑ Manufacturing Information Systems and Integration
- ❑ Manufacturing Systems Re-engineering

**Characterization of the research area.** CoDIS focuses its research activities on the understanding (*principles and models*) and support (*methods, tools, and technologies*) for collaborative networks and distributed architectures and systems applied to industry and services.

A large number of new organizational forms have emerged during the last years as a result of the challenges faced by industry, services and the society in general, and are enabled and even boosted by the advances in the ICT. Dynamic and highly integrated supply chains, extended enterprise, virtual enterprises, virtual organizations, virtual organizations breeding environments, professional virtual communities, value constellations, and collaborative virtual laboratories, represent examples of such trend. As such enterprises as well as other organizations and professionals seek complementarities and join their activities in order to participate in a wide variety of competitive business opportunities, for example in new markets or to reach scientific excellence for innovative developments. Similar trends can be identified within the non-profit/social-oriented contexts, e.g., in incident/crisis management, time banks, elderly care networks, etc.). Simultaneously at the shop-floor level a convergent phenomenon is observed. More and more manufacturing systems are composed of autonomous (progressively more intelligent) components / resources, interconnected by computer networks (a truly ubiquitous computing and sensing environment) forming “coalitions” that need to be easily re-configured as driven by the needs of flexibility and agility. The traditional paradigm of control systems is giving pace to other mechanisms (e.g. coordination, negotiation, fuzzy reasoning, contracting) that are characteristic of collaborative networks, as seen in the most innovative recent proposals for advanced manufacturing systems architectures. Therefore, the new discipline of **Collaborative Networks (CN)** provides a uniform paradigm to address such complex and highly dynamic systems.

CoDIS aims at contributing to important research questions in this area, for which novel approaches, models, and mechanisms are being designed and developed, namely:

- *Questions related to the theoretical foundation for CN:*
  - TQ1: What are the base principles and mechanisms of collaboration? And some further questions related to the CNs:
    - What is a suitable holistic reference model for CN?
    - What is a suitable taxonomic characterization of the variety of CN forms?

- Can we elaborate more formal models for an area that although promising, since in its infancy, has a quite ad-hoc nature?
- TQ2: What is a proper value system and benefits model for CN?
- TQ3: Which approach to CN can improve the agility and ease the re-configurability in manufacturing systems?
- *Questions related to the applied research in CN:*
  - AQ1: Which system architecture for tool-independent technological ICT infrastructures for CN?
  - AQ2: Which pilot demonstrations provide good representatives for creating scientific and industrial impact in this area?

**Research strategy.** In pursuing its objectives, CoDIS adopts the following approach:

- Combine the identified and acquired real-world requirements (from the applied and experimental perspective) with the theoretical conceptualization. This is reflected in:
  - Development / experimentation of CN in advanced application scenarios for diverse domains;
  - Seeking contributions from “adjacent” disciplines to systematize and formalize the base knowledge on CN.
- Active engagement with the international community of researchers in this area in order to:
  - Jointly achieve the necessary critical mass (not available in any single institution given the wide scope and highly multidisciplinary nature of CN) to address such complex domain;
  - Pursue a unification of approaches towards common reference models and wider recognition of CN as a new scientific discipline.

**Newly pursued challenges.** Current research of CoDIS focuses on:

- Pursuing the development of a reference model for collaborative networks and contributions to define a sounder theoretical foundation for the area.
- Development of a theoretical and formal basis for value systems in collaborative networks, leading to a better understanding of the mechanisms of value creation in collaborative networks (combining axiomatic set theory and soft computing methods).
- Develop soft computing methods for risk analysis and management in collaborative networks.
- Creation of a theoretical framework to exploit emergence, artificial life (swarm algorithms), self-organization, complexity/non-linear dynamics, and chaos theory in Evolvable Production Systems.
- Pursuing a unified collaborative networks based approach for manufacturing system, both at (agile) shop-floor and inter-organizational levels, following a balanced automation systems approach (combining agile self-organizing systems with anthropocentric systems).
- Developing advanced pilot cases of collaborative networks in collaboration with other academic partners and industry SME networks (e.g. Swiss-Chinese Microtech network, Spanish Helice network, German CeBeNetwork, Mexican IECOS network).
- Applying the collaborative networks paradigm to the management of energy production and distribution networks.

## 2.2 Projects

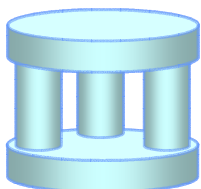
### IST ECOLEAD

European Collaborative Networked Organizations  
Leadership Initiative  
IP 506958

[www.ecolead.org](http://www.ecolead.org)

Total funding: 9 747 000 euros  
Uninova's funding: 1 079 920 euros

April 2004 – June 2008



ECOLEAD is a 6<sup>th</sup> Framework Program Integrated Project that aims at creating the necessary strong foundations and mechanisms for establishing an advanced collaborative and network-based industry society in Europe.

The ECOLEAD vision is that in ten years, in response to fast changing market conditions, most

enterprises and specially the SMEs will be part of some sustainable collaborative networks that will act as breeding environments for the formation of dynamic virtual organizations.

A holistic approach, combining VO Breeding Environments, VO Management, Professional Virtual Communities, Theoretical Foundation and ICT Infrastructures, is followed.

**Group's role:**

- Scientific & Technical Direction of the Integrated Project.
- Coordination of the integration aspects.
- Coordination of the Theoretical Foundation area.
- VO creation framework.
- Contribution to VO Breeding Environment framework and

**IST EUPASS**

Evolvable Ultra-Precision Assembly Systems IP



[www.eupass.org](http://www.eupass.org)

Uninova's funding: 350 000 euros

EUPASS is a 6th framework Integrated Project on reconfigurable microassembly systems.

The EUPASS project aims to develop affordable, cost effective and sustainable ultra-precision manufacturing solutions by offering rapidly deployable ultra-precision assembly services on demand.

**Group's role:**

- Identification of the key industrial needs in precision assembly in the short, medium and long-term.

**New project to start in 2008:**

**ePAL - extending Professional Active Life**

(Feb 2008- Jan 2010)

Funded under FP7 of European Commission.

Professional Virtual Communities framework.

**Partners:**

VTT (FI), UNINOVA (PT), University of Amsterdam (NL), TeS Teleinformatica e Sistemi (IT), Virtuelle Fabrik AG (CH), Gruppo Formula SPA (IT), Software AG España, S.A. (ES), T.X.T. e-solutions SPA (IT), Jozef Stefan Institute (SI), BIBA (DE), Czech Technical University (CZ), Universidade Federal De Santa Catarina (BR), ITESM (MX), Enicma GmbH (DE), Certicon A.S. (CZ), LogicaCMG Nederland B.V. (NL), France Telecom SA (FR), Siemens Aktiengesellschaft Oesterreich (AT), Stichting AIESEC International (NL), Comarch SA (PL), ISOIN (ES), CeBeNetwork (DE), SMT(CZ), SNS (IE), Orona (ES), Edinform (IT), Joensuu Science Park (FI).

- Development of a coherent vision for the successful development & application of precision assembly technologies within the EUPASS frame. Disseminate via Roadmap.
- Participation in the design of the overall EUPASS system architecture (assembly module platform), including multidisciplinary standardized interfaces, communication and decentralised control.
- Development of the control system for the individual modules.

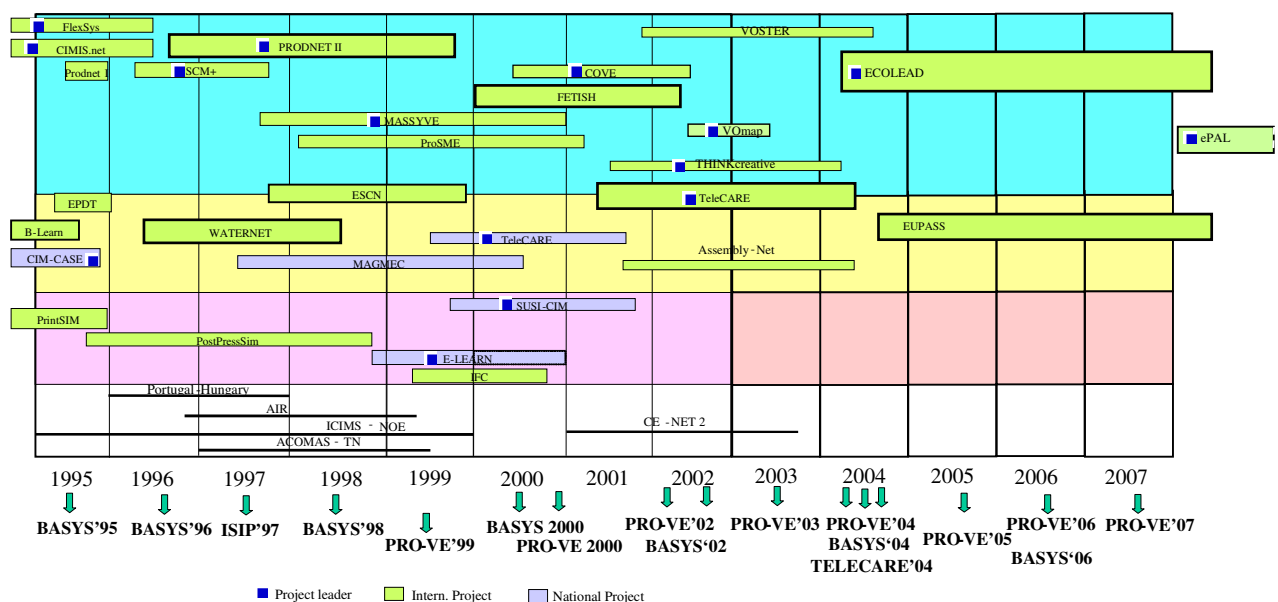
**Partners:**

Philips (NL), UNINOVA (PT), KTH (SE) TUT (FI) Feintool (CH), FHSO (CH), EPFL (CH), Bosch (DE), Festo (DE), IEF Werner (DE), FhG (DE), FZ Karlsruhe (DE), Beckhoff (DE), VDI-VDE (DE), Electrolux (IT), Masmec (IT), ITIA (IT), TQC (UK), UNOTT (UK), UFC, Flexlink (SE).

## 2.3 Past projects

- ❑ IST TeleCARE - A Multiagent Telesupervision System for Elderly Care (June 2001 – June 2004). [www.uninova.pt/~telecare](http://www.uninova.pt/~telecare)
- ❑ IST THINKcreative - Thinking network of experts on emerging smart organizations (Jul 2001 – Mar 2004). [www.uninova.pt/~thinkcreative](http://www.uninova.pt/~thinkcreative).
- ❑ IST VOSTER - Virtual Organizations Cluster (Dec 2001 – July 2004). <http://cic.vtt.fi/projects/voster/public.html>.
- ❑ GROWTH ASSEMBLY NET (1 Oct 2001 – 31 Aug 2004). [www.assembly-net.org](http://www.assembly-net.org).
- ❑ Esprit PRODNET II - Production Planning and Management in an Extended Enterprise (Sep 1996-Oct 1999). [www.uninova.pt/~prodnet](http://www.uninova.pt/~prodnet)
- ❑ Esprit WATERNET - Knowledge Capture for Advanced Supervision of Water Distribution Networks (Jun 1996-May 1998).
- ❑ INCO SCM+ - Beyond Supply Chain Management in Food Industry (Apr 1996 – Sep 1997). [www.uninova.pt/~scm](http://www.uninova.pt/~scm)
- ❑ Esprit ESCN - European STEP Centres Network (Nov 1997 – Oct 1999). [www.uninova.pt/~escn/](http://www.uninova.pt/~escn/)
- ❑ TSER IFC - Further training funds as an impulse for new models of life long training - Integrated Funding Concept (Mar 1999 – Jun 2000).
- ❑ INCO MASSYVE – Multi-Agent Agile Manufacturing Scheduling Systems in Virtual Enterprise Industry (Oct 1997 – Dec 2000).
- ❑ PRAXIS MAGMEC – Sensores de campo magnético para posicionamento e monitorização de corrente em Mecatrónica (Jun 1997 – Mai 2000).
- ❑ E-LEARN – Remote learning through Internet (Nov 1998-Dec 2000).
- ❑ INCO-DC ProSME - Easy-to-Use Procedures for Quality Management tailored for SMEs (Feb 98-Jan 2001)
- ❑ PRAXIS TeleCARE - A Multi-Agent Tele-Supervision System for Elderly Care (Jun 1999-Nov 2001)
- ❑ IST FETISH-ETF - Federated European Tourism Information System Harmonization (Jan 2000-Apr 2002)
- ❑ IFIP COVE - CO-operation infrastructure for Virtual Enterprises and electronic business (Jul 2000 – Jun 2002). [www.uninova.pt/~cove](http://www.uninova.pt/~cove)
- ❑ IST VMap - Roadmap design for collaborative virtual organizations in dynamic business ecosystems (Jul 2003 – Jun 2003). [www.uninova.pt/~vomap](http://www.uninova.pt/~vomap)
- ❑ IST CE-NET II - Concurrent Enterprise Network of Excellence (Jan 2001 – Aug 2003). [www.ce-net.org](http://www.ce-net.org)

Activities in perspective:



The group was one of the key founders of the following international conference series:

- BASYS – IFIP/IEEE International Conference on IT for Balanced Automation Systems
- PRO-VE – IFIP Working Conference on Virtual Enterprises

Steering Committee chairman of both conferences series: L.M. Camarinha-Matos

## 3. PUBLICATIONS 2007

### 3.1 Journals

- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. - Results assessment and impact creation in collaborative research - An example from the ECOLEAD project, *TECHNOVATION - International Journal of Technological Innovation, Entrepreneurship and Technology Management* (Elsevier), electronic version: Oct 2006, printed version: vol. 27(1-2), pp 65-77, 2007.
- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. - A comprehensive modeling framework for collaborative networked organizations, *Journal of Intelligent Manufacturing*, Volume 18, Number 5 / October, 2007, pp 527-615.
- ❑ Abreu, A.; Camarinha-Matos, L.M. - On the role of value systems to promote the sustainability of collaborative environments, *International Journal of Production Research*, *Online Publication Date: 01 January 2007, Printed version: Volume 46, Issue 5 March 2008, pages 1207 – 1229*.
- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. - A framework for virtual organization creation in a breeding environment, *IFAC Journal Annual Reviews in Control* (Elsevier), Volume 31, Issue 1, 2007, pp 119-135.
- ❑ Camarinha-Matos, L.M.; Abreu, A. - Performance indicators for collaborative networks based on collaboration benefits, *Journal of Production Planning and Control*, Vol. 18, 2007, pp 592 – 609.
- ❑ Santana P, Barata J, Correia L. Sustainable Robots for Humanitarian Demining. *International Journal of Advanced Robotic Systems* 2007; 4(2):207-218.
- ❑ Afsarmanesh, H.; Camarinha-Matos, L.M. - Enhancing performance in industrial collaborative networks, (short article), *International Journal of Production Research*. Vol. 46, No. 5, 1 March 2008, 1203–1205.
- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. - On reference models for collaborative networked organizations, *International Journal Production Research*. In Press.
- ❑ Barata, J.; Camarinha-Matos, L.M. - An agile multiagent based architecture for the shopfloor, *Journal of Intelligent and Robotic Systems* (Springer). In Press.
- ❑ Osorio, A. L.; Camarinha-Matos, L.M. - Distributed process execution in collaborative networks, *Journal of Robotics & Computer Integrated Manufacturing*. In Press.
- ❑ Afsarmanesh, H.; Camarinha-Matos, L.M. - A framework for management of virtual organizations breeding environments, *International Journal of Information Technology & Management*. In Press.

### 3.2 Conferences

- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. - Collaborative networks in industry and services: Research scope and challenges, in *Proceedings of COA 2007 – 8th IFAC Symposium on Cost Oriented Automation Affordable Automation Systems*, Ciudad de la Habana, Cuba, Feb 12 – 14, 2007.
- ❑ Afsarmanesh, H.; Camarinha-Matos, L.M. - Towards a semi-typology for virtual organization breeding environments, in *Proceedings of COA 2007 – 8th IFAC Symposium on Cost Oriented Automation Affordable Automation Systems*, Ciudad de la Habana, Cuba, Feb 12 – 14, 2007.
- ❑ Leitão P, Barata J. An Agent-based Disturbance Handling Architecture in Manufacturing Control. In: *Proc IMS'07 – IFAC Intelligent Manufacturing Systems Alicante – Spain, 23-25 May, 2007*.
- ❑ Frei R, Barata J, Serugendo G. A Complexity Theory Approach to Evolvable Production Systems. In: *Proc MARS 2007 – 3rd International Workshop on Multi-Agent Robotic Systems in conjunction with ICINCO 2007 – 4th International Conference on Informatics in Control, Automation and Robotics Angers – France, May, 2007*. pp 44-53.
- ❑ Barata J, Cândido G, Colombo AW. A Multiagent Based Control System for an Assembly Cell. In: *Proc IMS'07 – IFAC Intelligent Manufacturing Systems Alicante – Spain, 23-25 May, 2007*.
- ❑ Barata J, Ribeiro L, Onori M. Diagnosis on Evolvable Production Systems. In: *Proc ISIE'07 – IEEE International Symposium on Industrial Electronics Vigo – Spain, 4-7 June, 2007*.
- ❑ Barata J, Frei R, Onori M. Evolvable Production Systems: Context and Implications. In: *Proc ISIE'07 – IEEE International Symposium on Industrial Electronics Vigo – Spain, 4-7 June, 2007*.

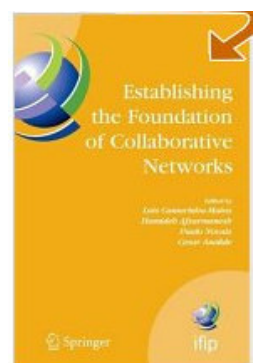
- ❑ Barata J, Ribeiro L, Colombo AW. Diagnosis using Service Oriented Architectures (SOA). In: Proc INDIN'07 – 5th IEEE International Conference on Industrial Informatics, 23-27 July, 2007.
- ❑ Barata J, Onori M, Frei R, Leitão P. Evolvable Production Systems: Enabling Research Domains. In: Proc CARV'07 – 2nd International Conference on Changeable, Agile, Reconfigurable, and Virtual Production Toronto – Canada, 22-24 July, 2007.
- ❑ Frei R, Ribeiro L, Barata J, Semere D. Evolvable Assembly Systems: Towards User Friendly Manufacturing. In: Proc ISAM'07 – IEEE International Symposium on Assembly and Manufacturing Ann Arbor – Michigan – USA, 22-25 Jul, 2007. pp 288-293.
- ❑ Semere D, Barata J, Onori M. Evolvable Assembly Systems: Developments and Advances. In: Proc ISAM'07 – IEEE International Symposium on Assembly and Manufacturing Ann Arbor – Michigan – USA, 22-25 Jul, 2007. pp 282-287.
- ❑ Camarinha-Matos, L.M.; Oliveira, A.I.; Ratti, R.; Demsar, D.; Baldo, F.; Jarimo, T. – A computer-assisted VO creation framework, in Proceedings of PRO-VE'07 – Establishing the foundation of collaborative networks, pp 165-178, Guimarães, Portugal, 10-12 Sep 2007.
- ❑ Camarinha-Matos, L.M.; Macedo, P. – Towards a conceptual model of value systems in collaborative networks, in Proceedings of PRO-VE'07 – Establishing the foundation of collaborative networks, pp. 53-64, Guimarães, Portugal, 10-12 Sep 2007.
- ❑ Afsarmanesh, H.; Camarinha-Matos, L.M. – Virtual Organizations Breeding Environments: Key results from ECOLEAD, in Proceedings of IFAC Conference on Cost Effective Automation in Networked Product Development and Manufacturing, Monterrey, Mexico, 2-5 Oct 2007.
- ❑ Camarinha-Matos, L.M. – Collaborated Networked Organizations in manufacturing, (invited keynote), in Proceedings of IFAC Conference on Cost Effective Automation in Networked Product Development and Manufacturing, Monterrey, Mexico, 2-5 Oct 2007.

### 3.4 Book chapters

- ❑ Cândido G, Barata J. A Multiagent Control System for Shop Floor Assembly. In: Marik V, Vyatkin V, Colombo AW, editors. *Holonic and Multi-Agent Systems for Manufacturing*. Berlin / Heidelberg: Springer 2007. p 293-302.
- ❑ Camarinha-Matos, L.M. – Collaborative networks in industry – Trends and foundations, in *Digital enterprise technology – Perspectives and challenges* (P. Cunha, P. Maropoulos, Ed.s), Springer, ISBN 978-0-387-49863-8, pp 45-56, 2007.
- ❑ Camarinha-Matos, L.M.; Oliveira, A. I. – Contract negotiation wizard for VO creation, in *Digital enterprise technology – Perspectives and challenges* (P. Cunha, P. Maropoulos, Ed.s), Springer, ISBN 978-0-387-49863-8, pp 333-342, 2007.
- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. – Concept of Collaboration, in *Encyclopedia of Networked and Virtual Organizations* (Goran D. Putnik and Maria Manuela Cunha, Eds.), Idea Group. In Press.
- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H. – Classes of Collaborative Networks, in *Encyclopedia of Networked and Virtual Organizations*, (Goran D. Putnik and Maria Manuela Cunha, Eds.), Idea Group. In Press.
- ❑ Abreu, A.; Camarinha-Matos, L.M. – Fair Distribution of Collaboration Benefits – The Shapley value, in *Encyclopedia of Networked and Virtual Organizations* (Goran D. Putnik and Maria Manuela Cunha, Eds.), Idea Group. In Press.

### 3.5 Books edition

- ❑ Camarinha-Matos, L.M.; Afsarmanesh, H.; Novais, P.; Analide, A. (Editors) – Establishing the foundation of collaborative networks, ISBN: 978-0-387-73797-3, IFIP Vol. 243, Springer, 2007.



### 3.6 Thesis

- ❑ Abreu, A. – Contribuição para o desenvolvimento de uma teoria das redes de colaboração (Contribution for the development of a theory of collaborative networks), FCT-UNL, Mar 2007.
- ❑ Castolo, L. O. – Collaborative Networks in Elderly Care – A Mobile Agents Approach, FCT-UNL, (waiting public defense).
- ❑ Ribeiro, L. – A Diagnostic Infrastructure for Manufacturing Systems, FCT-UNL, Oct 2007

## 4. EVENTS

### 4.1 Organization

The following events were (co-)organized by the group in 2007:

- ❑ ECOLEAD Workshop on Reference Models for Collaborative Networked Organizations, Valencia, Spain, 14-15 March 2007.
- ❑ ECOLEAD Workshop - Reference models, decision making and computational intelligence for future CNOs, Brussels, Belgium, May 2007
- ❑ Collaboration in the Organizing Committee of PRO-VE'07 - 8th IFIP Working Conference on Infrastructures for Virtual Enterprises, Guimarães, Portugal, 10-12 Sep 2007.
- ❑ ISIE'07 – IEEE International Symposium on Industrial Electronics, Vigo, Spain, July 4<sup>th</sup> – 7<sup>th</sup>, 2007. Organiser of the Special Session *ss17 – Evolvable Production Systems (2 sessions EPS1 & EPS2)*.

### 4.2 Chairing

Luis M. Camarinha-Matos:

- ❑ Steering Committee and Program Committee Chairman of PRO-VE'07 - 8th IFIP Working Conference on Infrastructures for Virtual Enterprises, Guimarães, Portugal, 10-12 Sep 2007.



José Barata:

- ❑ Program committee Co-Chair of SIES 2007 – IEEE Second International Symposium on Industrial Embedded Systems, Costa da Caparica, Portugal, 4-6 July 2007.

### 4.3 Participation in Scientific / Program Committees

Luis M. Camarinha-Matos:

- SAINT'07 - International Symposium on Applications and the Internet, 15-19 Jan 2007, Hiroshima, Japan.
- COA 2007 - 8th IFAC Symposium on Cost Oriented Automation Affordable Automation Systems, Ciudad de la Habana, Cuba, Feb 12 - 14, 2007.
- CSCWD 2007 - The 11th International Conference on CSCW in Design, Melbourne, Australia, April 26-28, 2007.
- ICINCO 2007 - 4th International Conference on Informatics in Control, Automation and Robotics, Angers, France, 9-12 Mai 2007.
- IRMA 2007 – International Conference on Managing Worldwide Operations and Communications with Information Technology, 19-23 May 2007, Vancouver, British Columbia, Canada.
- CTS 2007 - International Symposium on Collaborative Technologies and Systems, Orlando, Florida, USA, May 21-25, 2007.
- IESM'07 - International Conference on Industrial Engineering and Systems Management, Beijing, China, 30 May – 2 Jun 2007.

- ICE 2007 - 13th International Conference on Concurrent Enterprising, Sophia-Antipolis, France, 4-6 Jun 2007.
- TEAR 2007 – Workshop on Trends in Enterprise Architecture Research, June 6-8, 2007, St. Gallen, Switzerland.
- ISC 2007 - 5th Annual Industrial Simulation Conference, June 11-13, 2007, Delft, Netherlands.
- ICEIS 2007 - 9th International Conference on Enterprise Information Systems will be held at Funchal, Madeira, Portugal, 12 to 16, June 200.
- INES 2007 – 11th IEEE International Conference on Intelligent Engineering Systems, Budapest, Hungary, June 29 – July 2, 2007.
- ICABS'2007 - International Conference on Adaptive Business Systems, Chengdu, China, 22-24 Jul 2007.
- DEXA 2007 - 18th International Conference on Database and Expert Systems Applications, Regensburg, Germany, September 3-7, 2007.
- HoloMAS 2007 - 3rd International Conference on Industrial Applications of Holonic and Multi-Agent Systems, September 3 - 5, 2007, Regensburg, Germany
- APMS 2007 - Advances in Production Management Systems International Working Conference 2007, 17 - 19 September 2007, Linköping, Sweden.
- DET 2007- 4th CIRP Digital Enterprise Technology Conference, Bath, UK, 19-21 Set 2006.
- SOAS 2007 - 3rd International Conference on Self-Organization and Autonomous Systems in Computing and Communications, September 24-27, 2007, Leipzig, Germany.
- CEA'07 – IFAC Conference on Cost Effective Automation in Networked Product Development and Manufacturing, 2-5 Oct 2007, Monterrey, Mexico.
- ICEGOV2007 - International Conference on Theory and Practice of Electronic Governance, Macau, 10-13 Dec 2007
- ICDCIT2007 – 4th International Conference on Distributed Computing and Internet Technology, Bangalore, India, 17-20 Dec 2007.

José Barata:

- PRO-VE'07 - 8<sup>th</sup> IFIP Working Conference on Virtual Enterprises, Guimarães – Portugal, 10-12 Sep 2007.
- HOLOMAS'07 – 3<sup>rd</sup> International Conference on Industrial Applications of Holonic and Multi-Agent Systems, 3-5 Sep 2007, Regensburg - Germany.
- SOS'07 – Self-Organised Systems Workshop, Part of the 2007 Summer Computer Simulation Conference (SCSC'07), 14 – 19 Jul, San Diego, CA, USA.
- ISC2007 – Industrial Simulation Conference 2007 – Track Simulation in Engineering Processes, Delft – Netherlands, 11-13 June 2007.
- ESM2007 – European Simulation and Modelling Conference 2007 – Track Web Based Simulation, St Julian – Malta, 22-24 October 2007.
- ETFA 2007 – 12<sup>th</sup> IEEE International Conference on Emerging Technologies and Factory Automation, Patras - Greece, 25-28 Sep 2007 (Track 8 – Intelligent Robots and Systems).
- ISAM 2007 – IEEE International Symposium in Assembly and Manufacturing, Ann Arbor, Michigan – USA, 22-25 July 2007.
- INADIS 2007 – 2<sup>nd</sup> Workshop on Industrial Applications of Distributed Intelligent Systems, Salamanca, Spain, 12<sup>th</sup> November.

## 4.4 Participation in Conferences and Events

Group members participated in the following events:

- COA 2007 – 8th IFAC Symposium on Cost Oriented Automation Affordable Automation Systems, Ciudad de la Habana, Cuba, Feb 12 – 14, 2007.
  - Luis M. Camarinha-Matos
- PRO-VE'07 - 8th IFIP Working Conference on Infrastructures for Virtual Enterprises, Guimarães, Portugal, 10-12 Sep 2007.
  - Luis M. Camarinha-Matos, A. Inês Oliveira, Tiago Cardoso, João Rosas, Patrícia Macedo.
- CEA'07 - IFAC Conference on Cost Effective Automation in Networked Product Development and Manufacturing, Monterrey, Mexico, 2-5 Oct 2007.
  - Luis M. Camarinha-Matos

- IAD/IMS 2007 – IFAC International Workshops on Intelligent Assembly and Disassembly, and Intelligent Manufacturing Systems, Alicante – Spain, 23-25 May 2007.
  - José Barata
- ISIE'07 - IEEE International Symposium on Industrial Electronics, Vigo – Spain, 4-7 June 2007.
  - José Barata, Regina Frei, Luís Ribeiro
- CARV'07 - 2nd International Conference on Changeable, Agile, Reconfigurable, and Virtual Production Toronto - Canada, 22-24 July, 2007.
  - José Barata
- HOLOMAS 2007 – 3<sup>rd</sup> International Conference on Industrial Applications of Holonic and Multiagent Systems, Regensburg, Germany, September 3-5 2007.
  - José Barata
- INDIN'07 – 5th IEEE International Conference on Industrial Informatics, Vienna, Austria 23-27 July, 2007.
  - Luís Ribeiro
- MARS 2007 – 3rd International Workshop on Multi-Agent Robotic Systems in conjunction with ICINCO 2007 – 4th International Conference on Informatics in Control, Automation and Robotics Angers – France, May, 2007. pp 44-53
  - Regina Frei

## 4.5 Presentations in Seminars and Panels

In addition to the conference presentations mentioned above, the following talk (without paper) was given:

- Camarinha-Matos, L. M. - Collaborative networks: overview and success cases, *Seminario-Taller “Desarrollo de una red de organizaciones virtuales para el mejoramiento y fortalecimiento de la competitividad de las MIPyMEs Panameñas”*, Universidad Tecnológica de Panama, Panama, 26-27 Abr 2007.
- Camarinha-Matos, L. M. - ECOLEAD – ACHIEVEMENTS IN COLLABORATIVE NETWORKED ORGANIZATIONS, Opening talk, *PRO-VE'07 – 8<sup>th</sup> IFIP Working Conference on Virtual Enterprises*, 10 Set 2007, Guimarães, Portugal.
- Master Class delivered to the PROMEC/UFRGS – Programa de Pós Graduação da Engenharia Mecânica da Universidade Federal do Rio Grande do Sul, entitled Abordagem de Controlo para os Novos Desafios da Manufatura. Porto Alegre – Brazil, 4th May 2007.

## 5. OTHER ACTIVITIES

### 5.1 Academic management

L.M. Camarinha-Matos:

- Member of the Scientific Council of FCT/UNL.
- Member of the Assembly of FCT/UNL
- Member of the Council of the Electrical Engineering Department.
- Branch counselor of the IEEE Student Branch at UNL.
- Member of the “International Scientific Advisory Board” of INESC-Porto

J. Barata:

- Member of the Scientific Council of FCT/UNL.
- Member of the Council of the Electrical Engineering Department.

T. Cardoso:

- Member of the Senate of UNL.
- Member of the Assembly of FCT/UNL
- Member of the Council of the Electrical Engineering Department.

### 5.2 Projects, project proposals and other actions evaluation

J. Barata:

- Evaluator of the Sixth EU Framework Programme for Research and Technological Development (FP7), Marie Curie Intra-European Fellowships (EIF), Incoming International Fellowships (IIF) and Outgoing International Fellowships (OIF) schemes. September and October 2007.
- Evaluator of IAPMEI funded project “Desenvolvimento de Solução SIRIG+SISCOM+SAB”, SIME n°00/12880.
- Evaluator of Slovak Research and Development Agency, Slovak. Basic Research Project: APVV-0716-07

L.M. Camarinha-Matos:

- Member of the evaluation panel of the national student prize on Artificial Intelligence (APPIA), 2006, 2007.
- Evaluator of IAPMEI funded project QUADRA.

### 5.3 Evaluation boards of academic exams

L.M. Camarinha-Matos:

- Main evaluator of the PhD of António M. P. Ferrolho [Integração, Controlo e Sequenciamento em Sistemas Robóticos Industriais], University of Coimbra, 21 Sep 2007.

- ❑ Member of the defense committee for the PhD of Victor Guevara Masis [Information management for teleworking virtual organizations], University of Amsterdam, Netherlands, 19 Oct 2007.
- ❑ Chairman of the defense committee for the PhD of Helena V. G. Navas [Contribuições para a sistematização do toleranciamento dimensional e geométrico], FCT/UNL, 23 Nov 2007.
- ❑ Main evaluator of the PhD of Maria Leomilde R. Varela [Uma contribuição para o escalonamento da produção baseado em métodos globalmente distribuídos], University of Minho, 30 Nov 2007.
- ❑ Member of the evaluation committee for an Associate Professor position for the Electrical Engineering department (Systemic Engineering area) of the Faculty of Sciences and Technology of the New University of Lisbon, 20 Nov 2007.
- ❑ Member of the evaluation committee for an Associate Professor position for the Electrical Engineering department (Digital and Perceptual Systems area) of the Faculty of Sciences and Technology of the New University of Lisbon, 4 Dec 2007.
- ❑ Member of the evaluation committee (main evaluator for the CV and course proposal part) for the Habilitation exam on Industrial Management (Doctor Virgílio A. Cruz Machado), FCT/UNL, 4-5 Jun 2007.
- ❑ Member of the evaluation committee for the Habilitation exam on Tele-communications (Doctor Paulo C. L. Fonseca Pinto), FCT/UNL, 18-19 Sept 2007.
- ❑ President the committee for the recognition of the MSc of Javier Contreras Aparicio [Robotics and Automation], FCT/UNL, 25 Sep 2007.
- ❑ Main evaluator of the MSc of Bruno José de Sales Caires [Transparent access to relational, autonomous and distributed databases using semantic web and service oriented technologies], University of Madeira, 2 Nov 2007.
- ❑ President of the defense committee for the MSc of Ricardo Tiago Mendes [Um sistema de monitorização de incêndios para redes de sensores sem fios dispersas], FCT/UNL, 17 Dec 2007.

J. Barata:

- ❑ Main evaluator of the MSc of Saqib Dilshad [Machining Ontology: Towards a Multi Agent Manufacturing Model], Royal Institute of Technology, Sweden, 28 Mar 2007.
- ❑ Member of the evaluation committee of the MSc of Luís Ribeiro [A Diagnostic Infrastructure for Manufacturing Systems], FCT/UNL, 24 Oct 2007.
- ❑ Main evaluator of the MSc of Daniel Mendes da Silva [Portal para Acesso a Sensores Através de uma MANET de Nós Patrulha], FCT/UNL, 12 Nov 2007.
- ❑ Member of the evaluation committee for the MSc of Sérgio Zolá Ribeiro [Simulação para Robôs Móveis Aplicada à Desminagem], University of Madeira, 14 Dec 2007.
- ❑ President of the evaluation committee for the MSc of Michael Figueiredo [Real Time Embedded System for the Monitoring and Control of a Drill Process: Emphasis on the Characterisation of the Translational System], FCT/UNL, 21 Dec 2007.
- ❑ President of the evaluation committee for the MSc of Gonçalo Fernandes Pereira Martins [Real Time Embedded System for the Monitoring and Control of a Drill Process: Emphasis on the Characterisation of the Rotational System], FCT/UNL, 21 Dec 2007.

T. Cardoso:

- ❑ Member of the evaluation board for the international ImagineCup 2007 competition of Microsoft.

## 5.4 Membership in professional associations

L. M. Camarinha-Matos:

- ❑ IFIP TC5 (national representative), WG5.3, WG5.5 (chairman and founder), WG6.11, WG5.7.
- ❑ IEEE Robotics & Automation, Computer Society
- ❑ APPIA – Portuguese Association for Artificial Intelligence
- ❑ Portuguese Association of Engineers
- ❑ IFAC TC 4.4 Cost Oriented Automation
- ❑ INSTICC – Institute for Systems and Information Technologies, Control and Communications (honorary member).

- ❑ SOCOLNET – Society of Collaborative Networks (chairman and founder).
- ❑ Sub-committee on Collaborative Networks of IEEE Technical Committee on Industrial Agents (chairman).
- ❑ APDSI – Associação para a Promoção e Desenvolvimento da Sociedade de Informação.
- ❑ “Centre for Business Information, Organisation and Process Management (BIOPoM)” of University of Westminster, UK (external member).

J. Barata Oliveira:

- ❑ IEEE – Computer, Robotics & Automation, Systems Man & Cybernetics
- ❑ ACM – Association for Computing Machinery
- ❑ AAAI – American Association of Artificial Intelligence
- ❑ ASME – American Association of Mechanical Engineers
- ❑ APSIOT – Portuguese Association for Industrial Sociology, Organisations, and Labour
- ❑ SOCOLNET – Society of Collaborative Networks
- ❑ IFAC TC 4.4 Cost Oriented Automation

A. Abreu:

- ❑ Portuguese Association of Engineers
- ❑ SOCOLNET – Society of Collaborative Networks

J. Rosas:

- ❑ Portuguese Association of Engineers
- ❑ SOCOLNET – Society of Collaborative Networks

T. Cardoso:

- ❑ IEEE - Computer Society Member
- ❑ SOCOLNET – Society of Collaborative Networks

F. Ferrada:

- ❑ SOCOLNET – Society of Collaborative Networks

A. I. Oliveira:

- ❑ SOCOLNET – Society of Collaborative Networks

P. Macedo:

- ❑ SOCOLNET – Society of Collaborative Networks

## 5.5 Teaching activities

The group was responsible for the following teaching activities:

*Electrical and Computers Engineering Course (UNL):*

- Data Modeling in Engineering
- Real Time Systems
- Robotics
- Intelligent Supervision
- Systems Integration
- Multimedia Information Systems
- Virtual Enterprises
- Telerobotics and Autonomous Systems
- Project of Robotics and CIM.

## 5.6 Visitors

The group received the visit of the following researchers:

- Dr. Rolf Bernhardt, IPK, Germany
- Prof. Americo Azevedo, INESC Porto, Portugal

- Prof. Silvio Carmo Silva, University of Minho, Portugal
- Arash Alesh, Iran
- Dr Walter Colombo, Schneider Electric, Germany
- Mr Francois Jammes, Schneider Electric, Grenoble
- Dr Christoph Hanisch, Festo, Germany
- Prof. Mauro Onori, KTH, Sweden
- Mr Raphael Adamietz, KTH/FZK, Sweden/Germany

## 5.7 Coordination of SOCOLNET

The group is coordinating the international Society of Collaborative Networks (SOCOLNET), which started activities in Nov 2005.



[www.socolnet.org](http://www.socolnet.org)

SOCOLNET is an international technical and scientific association, not for profit, that aims at promoting and stimulating scientific research, education, technological development, scientific and technical interactions among researchers in the area of Collaborative Networks, including virtual organizations, virtual enterprises, virtual communities, virtual laboratories, and related areas.

Currently the society has 170 members from 36 countries.