



8th European Workshop on Advanced Control and Diagnosis 2010

18 – 19 November 2010



*Faculty of Engineering, University of Ferrara
Via Saragat, 1. 44122 - Ferrara (FE). ITALY*

On behalf of the International Programme Committee and the Local Organising Committee of the 8th *European Workshop on Advanced Control and Diagnosis*, ACD2010, in the following the main features related to this event are summarised. It was held at the Faculty of Engineering of the University of Ferrara, Italy, on 18th and 19th November 2010. It is worth noting that this year in Ferrara, the workshop has become a *European* event.

The European ACD2010 Workshop brought together academics and engineers in control engineering and computer science. The workshop highlighted also some recent results in the development of methods, and tools, as well as some prototypes that are of particular interest to academics and engineers in automatic control and diagnosis. Another aim of the ACD2010 was to enhance cross-cultural exchange, facilitate co-operation among potential partners, as well as to promote student and teacher exchange and co-supervision of doctorates.

The programme included four plenary talks, and twelve regular sessions in three parallel tracks. The plenary talks gave participants the opportunity to share and draw on the knowledge and experience of internationally acknowledged experts in new perspectives for research in fault tolerant control, design and evaluation of reconfiguration-based fault tolerance using the lattice of system configurations, developments in bilinear systems modelling and control with industrial applications, and norm-based point of view for fault diagnosis, with application to aerospace missions.

During the workshop, two awards, the best regular paper (application or theoretical), and the best student paper, funded by the Consorzio Ferrara Ricerche of the University of Ferrara, were granted to young researchers and students.

The conference general chair was Silvio Simani (Engineering Department, Ferrara University, Italy), Marcello Bonfè (Engineering Department, Ferrara University, Italy) the vice-chair, whilst Sergio Beghelli (Engineering Department, Ferrara University, Italy) kindly accepted to be honorary chair of this event. Paolo Castaldi and Nicola Mimmo (Department of Electronics, Informatics, and Systems, Bologna University, Italy) did an outstanding job as programme chairs, preparing an exciting and invigorating scientific programme. Elena Mainardi (Engineering Department, Ferrara University, Italy) developed and maintained the workshop web site (<http://www.ing.unife.it/ACD2010>), whilst Mauro Mazza (Engineering Department, Ferrara University, Italy) was the local organisation chair.

For this event, Ferrara was chosen because of its good international accessibility, and also because the region is attractive from a tourist point of view. In more detail, Ferrara is a city in Emilia-Romagna, northern Italy, capital city of the Province of Ferrara. It is situated 50 km north-northeast of Bologna, on the Po di Volano, a branch channel of the main stream of the Po River, located 5 km north. Ferrara is on the main rail line from Bologna to Padua and Venice, and has branches to Ravenna. The town has broad streets and numerous palaces dating from the 14th century and 15th century, when it hosted the court of the House of Este. For its beauty and cultural importance, Ferrara has been qualified by UNESCO as *World Heritage Site*. Modern times have brought a renewal of industrial activity (machine part manufacture, petrol-chemical pole, food packaging and producing). In 2006, due to its important historical significance, Ferrara became the headquarters of the Italian Hermitage Museum. It is the fifth city in the world to have been linked with the Russian museum. From this union was born the Hermitage-Italy Foundation.

Local Organising Committee

Silvio Simani	General Chairman
Marcello Bonfè	Vice-chairman
Sergio Beghelli	Honorary chairman
Elena Mainardi	Organization Chairman
Paolo Castaldi	Program Chairman
Nicola Mimmo	Student Paper Chairman
Mauro Mazza	Local Arrangement Chairman

European ACD2010 International Programme Committee

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Christophe Aubrun (France)	Jan Lunze (Germany)
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Sergio Bittanti (Italy)	Nicola Mimmo (Italy)
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Keith J. Burnham (United Kingdom)	Krzysztof Patan (Poland)
Marco Campi (Italy)	Ron J. Patton (United Kingdom)
Alessandro Casavola (Italy)	Andrzej Pieczyński (Poland)
Paolo Castaldi (Italy)	Marios M. Polycarpou (Greece)
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Giuseppe Franzè (Italy)	Marcel Staroswiecki (France)
Erik Frisk (Sweden)	Ralf Stetter (Germany)
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David Henry (France)	Piotr Tatjewski (Poland)
Marina Indri (Italy)	Didier Theilliol (France)
Sirrka L. Jamsa-Jounela (Finland)	Andrea Tilli (Italy)
Andrzej Kasprzak (Poland)	Dariusz Uciński (Poland)
Paul King (United Kingdom)	Maria Elena Valcher (Italy)
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Józef Korbicz (Poland)	Antonio Visioli (Italy)
Leszek Koszalka (Poland)	Holger Voos (Germany)
Jan Kościelny (Poland)	Marcin Witczak (Poland)
Suzanne Leseq (France)	

Technical Programme

The workshop programme committee had the challenging task of choosing high quality submissions. Each paper was peer reviewed by independent referees with an average number of reviews per paper equal to 2.6. A number of 282 reviews were requested, and 52 were refused. Thus, based on the recommendation of the reviewers, 66 papers among the 88 submissions were finally accepted, with an acceptance rate of about 75%. These papers were presented in 12 sessions based on 3 parallel tracks. Among the 158 authors of the 66 submitted papers, about 80 delegates from 20 different countries attended the workshop during these 2 days. Regarding the participants, 6% were from industry, and 17% students. The workshop programme and the conference proceedings can be accessed from the workshop web site <http://www.ing.unife.it/ACD2010/>.

The key numbers of the workshop are summarised in the following Table and Figure:

Submitted papers	88
Accepted paper	66
Plenary talks	4
Rejected papers	22
Acceptance rate	~75%
Requested reviews	282
Received reviews	230
Average number of reviews per submission	2.6
Number of participants	80
Number of no show papers	1

Table 1: ACD2010 Workshop Key Numbers.

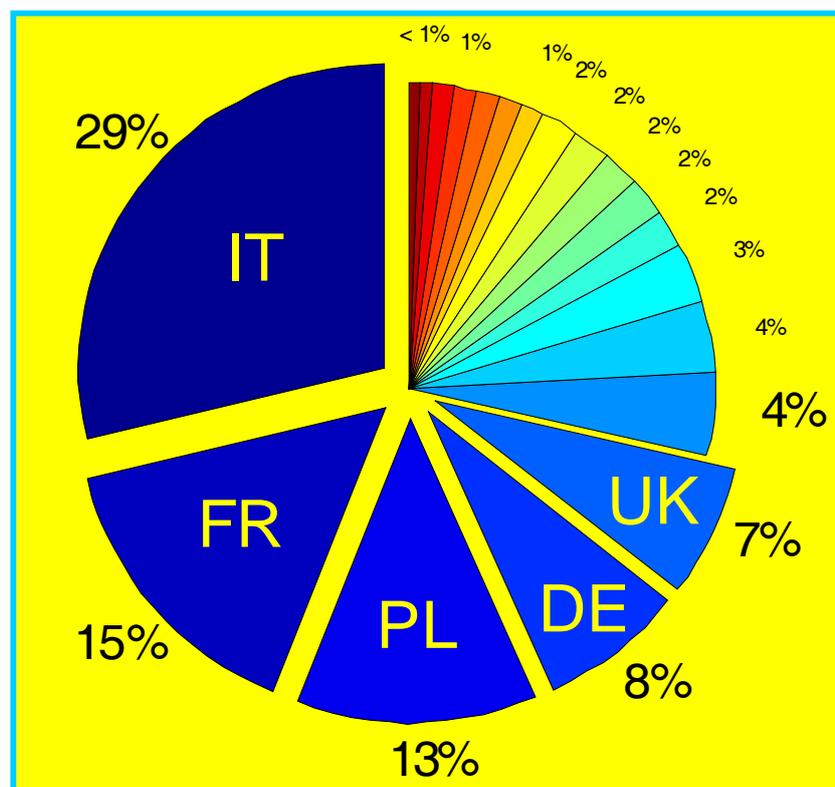


Figure 1: Authors' Countries Involved in the ACD2010 Workshop.

As shown in Figure 1, the authors of the submitted contributions can be sorted by countries as summarised in Table 2.

Italy	28.7%
France	15.3%
Poland	12.8%
Germany	7.6%
United Kingdom	7%
Serbia	4.4%
Iran	3.8%
Spain	3.2%
Turkey	2%
Finland	2%
Czech Republic	2%
Cote d'Ivoire	2%
Colombia	2%
United States	1.2%
Switzerland	1.2%
Slovakia	1.2%
Hungary	1.2%
Algeria	1.2%
Tunisia	0.6%
Austria	0.6%

Table 2: Per Cent Values of the Authors per Country.

In addition to the 12 technical sessions, the workshop had 4 plenary talks, whose speakers and talk titles are listed below:

- Ron J. Patton. Department of Engineering, University of Hull, UK.
“New Perspectives for Research in Fault Tolerant Control”
- Keith J. Burnham. Control Theory and Application Centre, Coventry University, UK.
“Developments in bilinear systems modelling and control with industrial applications”
- Marcel Staroswiecki. SATIE, ENSCachan, USTL, CNRS, UniverSud, France.
“Design and Evaluation of Reconfiguration-based Fault Tolerance Using the Lattice of System Configurations”
- David Henry. Bordeaux University, IMS lab. LAPS Department, France.
“A Norm-based Point of View for Fault Diagnosis: Application to Aerospace Missions”

The plenary presentations in PDF format can be downloaded from the workshop web site <http://www.ing.unife.it/ACD2010/>.



Figure 2: Prof. Ron J. Patton.



Figure 3: Prof. Keith J. Burnham



Figure 4: Prof. Marcel Staroswiecki.

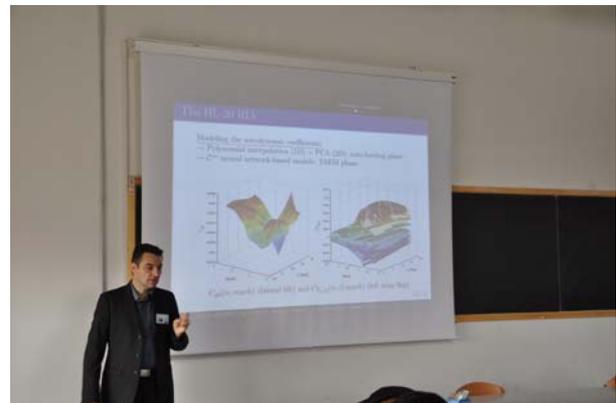


Figure 5: Prof. David Henry.

The high quality of the programme was possible thanks to the efforts of the programme chairs, the members of the International Programme Committees and the local organization staff. The official workshop proceedings are published in CD Rom electronic format, edited by the Department of Engineering of the University of Ferrara, Italy, and included in the registration package. The workshop proceedings in electronic PDF format can be downloaded from the workshop web site <http://www.ing.unife.it/ACD2010/>.

During the workshop, two awards, and the prizes of 200 Euro each, for the best regular paper (application or theoretical), and for the best student paper, funded by the Consorzio Ferrara Ricerche of the University of Ferrara, were granted to young researches and students. In particular, the paper entitled “Smith Predictor Based Control of Continuous-Review Perishable Inventory Systems with a Single Supply Source” by Przemyslaw Ignaciuk & Andrzej Bartoszewicz was awarded as Best Regular Paper, whilst the paper “Design of Unknown Input Reconstruction Algorithm in Presence of Measurement Noise” by Malgorzata Sumislawska, Tomasz M. Larkowski, Keith J. Burnham, as Best Student Paper. The papers, together with the certificate awards, can be downloaded from the workshop web site <http://www.ing.unife.it/ACD2010/>.

The European ACD2010 Workshop was sponsored by Consorzio Ferrara Ricerche (<http://www.consorzioferrararicerche.it/>), and the Department of Engineering of the University of Ferrara, Italy (<http://www.ing.unife.it/>). It was supported by the Intelligent Control and Diagnosis (<http://www.icd.cran.uhp-nancy.fr/>) working group.

The *University of Ferrara* (Italian: Università degli Studi di Ferrara) is the main university of the city of Ferrara in the Emilia-Romagna region of northern Italy. In the years prior to the First World War the University of Ferrara, with more than 500 students, was the best attended of the free



Figure 6: Mr. Przemyslaw Ignaciuk receives the certificate award by Paolo Castaldi, the Programme Chair.



Figure 7: Ms. Malgorzata Sumislawska receives the certificate award by Nicola Mimmo, the Student Paper Chair.

universities in Italy. Today there are approximately 12,000 students enrolled at the University of Ferrara with nearly 400 degrees granted each year. The teaching staff number 600, including 223 researchers. It is organized into 8 Faculties. Marquis Alberto V D'Este founded the University of Ferrara on March 4, 1391 with the permission of Pope Boniface IX. The Studium Generale was inaugurated on St. Luke's Day (October 18) of that year with courses in law, arts and theology. After the unification of Italy, Ferrara University became a free university with faculties of Law and Mathematics, a three-year course in Medicine (reduced to two years in 1863-64), as well as Schools of Veterinary Medicine (abolished in 1876), Pharmacy, and for public Notaries. After World War II, it started to be state-supported and this allowed the opening of many faculties and research departments. The most remarkable growth took place between the '70s and the '80s, when Prof. Antonio Rossi was in charge of it as Rector.

Founded in 1993, the *Consorzio Ferrara Ricerche* (CFR – Ferrara Research Consortium) is a non-profit organisation with public and private participation, aimed at the promotion, development and exploitation of human, scientific, technological and economic resources mainly of the territory of Ferrara. The mission of CFR is to promote and to manage research, innovation and technology transfer, by offering itself as a decisive and preferential partner for universities, research centres, public institutions and industrial companies in Italy and abroad, besides acting as a link between the generators of know-how, industrial organisations and the working world. The CFR chiefly operates in the forefront fields of the promotion of the pre-competitive research and the technological transfer for industrial application; the EU, ministerial and regional Programmes, and the coordination of all the activities involved in the participation and management of the various types of operation; the organization of scientific events on a national and international scale, the management of post-university Master courses, advanced training courses, and CME (Continuing Medical Education) training courses aimed at doctors and health workers.

Finally, the European ACD2010 Workshop was supported by the *Intelligent Control and Diagnosis* (ICD, <http://www.icd.cran.uhp-nancy.fr/>) working group founded in 1998, which leads to new developments and applications in the field of automatic control and fault diagnosis. The aim of the ICD working group is to explore research opportunities in the direction of Fault Diagnosis and Fault-tolerant Control for technical systems. ICD Research activities can be summarized as follows:

- Development of advanced methods with applications to automatic control and fault detection and isolation (FDI);
- Design of FTC strategy providing an optimal performance of the reconfigured system according to the reliability measure in order to ensure the dependability of the system and the human safety;

- Investigation of typical application areas and technology transfer to industrial areas of special interest for control and diagnosis of technical systems. The domains of application concern different types of systems such as embedded systems, distributed systems, networked systems.

Within this working group, the members co-operate in different ways, one important one are joint European projects. The aim for the future is to initiate more of such projects, especially in co-operation with industry and to tackle with advanced methods in Fault Tolerant Control (FTC) framework in order to improve the human safety and dependability of the system. The chairs are the Prof. C. Aubrun and the Prof. D. Theilliol. The members and partners are:

- Gerhard-Mercator-Universitaet Duisburg, Germany
- Centre de Recherche en Automatique de Nancy, France
- GIPSA-Lab Grenoble, France
- University of Karlsruhe, Germany
- Control Theory and Applications Centre, Coventry University, United Kingdom
- Institute of Control and Computation Engineering, University of Zielona Gora, Poland
- Department of Engineering, University of Ferrara, Italy
- Automatic Control Department, Universidad Politecnica de Cataluna, Spain
- Engineering Department, The University of Hull, United Kingdom

ACD-ICD Members and Partners



University of Ferrara



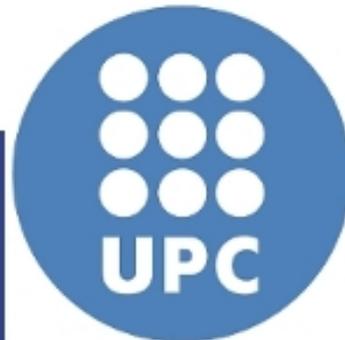
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Some Pictures



Figure 8: Opening Ceremony. Head of the Department, Prof. Giorgio Vannini, and Dr. Roberta Fusari, Town Planning Council, on behalf of the City Council.



Figure 9: Opening Ceremony, Silvio Simani, the General Chair.



Figure 10: Interior Courtyard of Castello Estense: Social Event.



Figure 11: Small Scale Model of Castello Estense: Private Guided Tour of the Castello Estense Museum. Social Event.



Figure 12: Private Guided Tour of the Castello Estense Museum. Social Event.



Figure 13: Imbarcadero Room of Castello Estense. Social Dinner.

More photos available from <http://www.ing.unife.it/ACD2010/>

December 3rd, 2010,
Silvio Simani and Marcello Bonfè
Paolo Castaldi and Nicola Mimmo
Elena Mainardi and Mauro Mazza