



NATO Undersea Research Centre  
Centre de Recherche Sous-Marine de l'OTAN



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# **The Ninth International Conference on Information Fusion (Fusion 2006) Final Conference Report**

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October 2006

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**Abstract**

The 9<sup>th</sup> International Conference on Information Fusion (FUSION 2006) was held on 10-13 July 2006 in Florence, Italy. The FUSION conference series serves as the annual gathering and is the flagship event of the International Society of Information Fusion. The International Society of Information Fusion is an independent, non-profit organization dedicated to advancing the knowledge, theory and applications of information fusion. Through its website, conferences, publications and member services, it is its goal to encourage the exchange of information among information fusion professionals worldwide.

This document is the final conference report that, along with the transfer of conference funds to ISIF and IEEE, represents the main deliverable from the FUSION 2006 organizing committee. It includes an overview of the conference planning process, a discussion of key policy decisions, a complete listing of the conference program, committee members, special session organizers, session chairs, and conference attendees, a description of the related social events, the final budget, lessons learned, and recommendations to the ISIF Board of Directors.

NURC provided high-visibility contributions to FUSION 2006: the General Co-chair, Technical Chair, Local Arrangements and Finance Chair, several members of the Technical Program Committee, numerous paper contributions, financial sponsorship, and publication of the CD-ROM proceeding.



NATO Undersea Research Centre  
Centre de Recherche Sous-Marine de l'OTAN



## THE NINTH INTERNATIONAL CONFERENCE ON INFORMATION FUSION (FUSION 2006)

### FINAL CONFERENCE REPORT

NURC-SP-2006-005

October 2006

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## 1 Introduction

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The 9<sup>th</sup> International Conference on Information Fusion (FUSION 2006) was held on 10-13 July 2006 in Florence, Italy. The FUSION conference series serves as the annual gathering and is the flagship event of the International Society of Information Fusion ([www.isif.org](http://www.isif.org)).

The International Society of Information Fusion is an independent, non-profit organization dedicated to advancing the knowledge, theory and applications of information fusion. Through its website, conferences, publications and member services, it is its goal to encourage the exchange of information among information fusion professionals worldwide.

The past, present, and future (planned to date) FUSION conferences are as follows:

- 1998: Las Vegas, Nevada, USA
- 1999: Sunnyvale, California, USA
- 2000: Paris, France
- 2001: Montreal, Quebec, Canada
- 2002: Annapolis, Maryland, USA
- 2003: Cairns, Queensland, Australia
- 2004: Stockholm, Sweden
- 2005: Philadelphia, Pennsylvania, USA
- **2006: Florence, Italy**
- 2007: Quebec City, Quebec, Canada

This document is the final conference report that, along with the transfer of conference funds to ISIF and IEEE, represents the main deliverable from the FUSION 2006 organizing committee. It includes an overview of the conference planning process, a discussion of key policy decisions, a complete listing of the conference program, committee members, special session organizers, session chairs, and conference attendees, a description of the related social events, the final budget, lessons learned, and recommendations to the ISIF Board of Directors.

An electronic list of e-mail addresses of the technical program committee (TPC) members as well as a second consolidated list of submitting authors and co-authors, TPC members, and conference attendees (a total of approximately 1000 e-mail addresses) have been provided to the FUSION 2007 organizing committee and to the ISIF Board of Directors.

The second, related publication that accompanies this document is in electronic format (CD-ROM): the *Proceedings of the 9<sup>th</sup> International Conference on Information Fusion*, ©2006 IEEE ISIF, ISBN 0-9721844-6-5, IEEE Catalog No. 06EX1311C.

Additional information may be found at the FUSION 2006 website ([www.fusion2006.org](http://www.fusion2006.org)).

## 2 A Retrospective on FUSION 2006

The initial idea for proposing to organize and to host FUSION 2006 resulted from discussions between members of the ISIF BoD, Stefano Coraluppi and Alfonso Farina at FUSION 2004 in Stockholm, Sweden. At that time, the ISIF BoD expressed its interest in receiving a proposal for a future FUSION conference to be held in Italy. On his return to La Spezia, Stefano Coraluppi continued this discussion with Peter Willett, who was then a visiting researcher at

NURC, as well as with NURC colleagues Alberto Baldacci and Craig Carthel. After securing the necessary management approval at NURC, the group decided enthusiastically to pursue this initiative.

Alfonso Farina expressed his interest to remain involved, though in a limited role due to his corporate commitments. The proposed organizing committee was completed with the inclusion of Robert Lynch, who had previous successful experience on the FUSION 2002 team, and of Stefano Marano of the University of Salerno.

The proposed organizing committee considered Rome and Florence as conference locations. Ultimately, Florence was selected based on its proximity to NURC, where most of the conference planning activities were coordinated. After considering a number of options, the team selected DGMP as its organizing secretariat ([www.dgmpincor.it](http://www.dgmpincor.it)). The organizing team narrowed its set of choices of conference venue to the *Convitto della Calza* ([www.calza.it](http://www.calza.it)) and the larger *Palazzo dei Congressi* ([www.firenzefiera.it](http://www.firenzefiera.it)). For the social events, it was decided to propose the welcome reception on the first evening of the regular session days (Tuesday 11 July), to boost attendance, and to hold the banquet dinner the following evening.

The FUSION 2006 conference proposal was submitted to ISIF in December 2004. In April 2005, the official proposal acceptance letter from Dale Blair (ISIF President 2005) was received. The ISIF BoD expressed a preference for the less expensive *Convitto della Calza* as conference venue. In addition, it was agreed to modify the originally proposed dates (3-6 July 2006) by one week to 10-13 July 2006 to accommodate possible conflicts with IPMU 2006 in Paris, France ([ipmu2006.lip6.fr](http://ipmu2006.lip6.fr)). Actually, the benefit to this date change is debatable, since it produced a conflict with the IEEE Information Theory Society's main symposium. The calendar of conferences (see the IEEE's web resources) is quite dense, and any conference dates must be selected with care and an eye to tradeoffs.

## **2.1 The official announcement**

The FUSION 2006 conference website ([www.fusion2006.org](http://www.fusion2006.org)) went online at the beginning of July 2005, before the start of FUSION 2005 in Philadelphia PA, USA (figure 2.1). Further, the call for papers (figure 2.2) was sent to the organizers for distribution with other conference materials. At the banquet dinner in Philadelphia, Peter Willett delivered a slide presentation advertising FUSION 2006. Additionally, Stefano Coraluppi and Alberto Baldacci were in attendance and spoke with the Philadelphia organizers to gather advice and lessons learned.

## **2.2 Key policy decisions**

The formulation of the contents for the conference website and the call for papers included a number of important decision-making steps. First, the call for papers included a brief summary of the objectives and topic areas for the conference. This led to significant streamlining and reorganizing the topic lists from previous FUSION calls for papers. Topics were grouped under the headings *foundational tools*, *technological advances*, *algorithmic developments*, and *application areas*.

Special session proposals were solicited by 1 December 2005. This led to a healthy response in special session proposals; all proposals were deemed of good quality and were accepted. Ultimately, all but three sessions were confirmed, leading to a total of thirteen special sessions. Those that had an insufficient number of accepted papers were the following: *Multistatic Sonar Operations Research* (Doug Grimmer), *Analytical Methods for Characterizing Filter Performance Relevant to Multi-Sensor Tracking Performance* (Dale Blair, John Gray, Rabinder Madan, and A. Sunshine Smith-Carroll), and *Modelling and Control of Transportation and*

*Traffic Systems* (Maria Pia Fanti and Davide Giglio). Accepted papers in the first of these were merged into the other special session organized by Doug Grimmer.

At previous FUSION conferences, very different approaches have been taken to the review process for special session paper submissions. This year, it was decided to strike a compromise between the discretion and authority of the conference organizers to determine which papers to accept, while at the same time properly accounting for the views of the special session organizers. In particular, special session organizers were included as technical reviewers for all papers submitted to their special sessions. Subsequently, before informing authors of the acceptance or rejection decision, the special session organizers were informed and their agreement with the decision was verified. In all but a few cases there was agreement between the review decision and the special session organizers. In a few cases, it was agreed to accept the paper but to move it out of the special session as it did not fit well with the session topic.

FUSION 2006 did include some non-reviewed papers. The seven position papers included in Ivan Kadar's invited panel discussion, *Issues and Challenges in Resource Management (and its Interaction with Level 2/3 Fusion) with Applications to Real-World Problems*, were not reviewed and were not required to satisfy the page restrictions (4 to 8 pages). Similarly, the three plenary lecturers were invited to include papers in the conference proceedings, and one did so (Roy Streit).

In mid-December 2005, the organizing committee consolidated a list of all technical program committee members from FUSION 2004, along with additional names of persons that were deemed qualified to serve in this capacity. These proposed technical program committee (TPC) members were contacted, and those that responded favorably were included in the FUSION 2006 TPC. (Ultimately, several individuals who had originally agreed to serve on the TPC but later did not participate in the review process were removed from the TPC.)

Proposals to organize tutorials were due by 15 January 2006. The organizers of the most successful tutorials in terms of the number of attendees from FUSION 2005 were encouraged to respond to the solicitation. Additional tutorials were solicited in areas that were deemed of interest to FUSION attendees. In all, eleven tutorials were selected. Of these, two were withdrawn, one due to personal issues and one due to a limited registration response. The withdrawn tutorials were the following: *Defensive Forecasting* (Glenn Shafer), and *Gene Regulatory Networks: Artificial Neural Network-based Methodologies* (Rajat De).

Web-based paper submissions were due by 14 February 2006. This deadline was delayed until 28 February 2006 in response to a number of requests for additional time. In all, 345 paper submissions were received. It was decided to stick to the originally advertised date of 1 April 2006 for notification of accepted papers; this led to an intense paper-reviewing process, as discussed below. Author registrations and final paper uploads were due by 15 May 2006. Unofficially, this date was allowed to slide well into June, in response to numerous requests for extra time.

Only those accepted paper that met all publication criteria were included in the conference proceedings. This produced some attrition, as some of the 278 tentatively-accepted papers were withdrawn or removed, leading to 263 final accepted papers. The publication criteria were the following:

- Registration support: each student registration was entitled to support one conference paper, and each full registration was entitled to support up to two conference papers;
- Copyright form: each paper was required to have a signed faxed ISIF/IEEE copyright form;

- Proof of student status: each paper supported by a student registration was required to have supporting proof of full-time student status from a recognized educational institution;
- Compliance with ISIF publication format: each paper was checked for compliance with the ISIF paper format (Word-based and LaTeX-based style templates were made available on the conference website).

### **2.3 Conference rates**

FUSION 2006 used a web-based registration process that was accessible from the conference website. Both online and offline payment options were allowed. Early registration rates applied up to 1 May 2006; the registration rates were as follows:

- Early registration: €650;
- Regular registration: €750;
- Early student registration: €325;
- Student registration: €375.

Full registration fees included access to all technical sessions, conference kit (badge, bag, conference program, pen, and notepad), three full-course luncheons, two coffee breaks per day, free wireless internet access at the *Convitto della Calza*, CD-ROM proceedings, certificate of attendance, ISIF membership, shuttle service to the conference banquet, and tickets to the welcome reception and conference banquet. Student registrations did not include tickets for the welcome reception and banquet dinner. Additional tickets for social events could be purchased by all registrants for €30 and €70, respectively (with early rates of €20 and €50, respectively). Additionally, guided tours were available for accompanying friends and family members.

Tutorial rates were as follows:

- 1<sup>st</sup> Tutorials: €250 (early rate: €200);
- Additional tutorials: €125 each (early rate: €100).

Tutorial fees included tutorial notes for the tutorial(s) attended, as well as coffee breaks. Revenue sharing on tutorials was on the basis of a 50%-50% split between the conference budget and speakers. (An exception to this rule was made for the tutorial co-organized by Alfonso Farina, FUSION 2006 Executive Chair, where no speaker fees were assessed.)

### **2.4 The scientific secretariat**

The initial plans were for the web-based paper submission and review process to be run and maintained as part of the main FUSION 2006 conference website. In the latter part of 2005, it became clear that this would be expensive and riskier than having full control over the scientific secretariat. Thus, the decision was made to proceed with an in-house website linked to the main conference website ([fusion.carthel.com](http://fusion.carthel.com)).

All paper submissions required the selection of relevant topic areas. Similarly, all TPC members were asked to create reviewer accounts on the site, and this involved the selection of topic areas of expertise. Papers were mapped to reviewers such that all reviewers were assigned no more than five papers, and all were (nominally) in their area of expertise. A total of 961 technical reviews for the 345 papers submitted papers were received. Most papers received three reviews, with all papers receiving at least two.

Technical reviews involved the selection of scores on a scale of 1 to 5 (strong reject, weak reject, marginal, weak accept, strong accept) for four questions regarding the merits of the paper and its suitability for the conference. A fifth question solicited an overall assessment. The overall score for each paper was computed by averaging the scores of the reviewers, where each reviewer's score was a weighed average over all responses, with half the weight on the overall assessment. Normalized scores for all papers are shown in figure 2.3. Interestingly, there seemed to be a natural cutoff in the quality of submissions after approximately the first 300 papers, with normalized scores below 0.5.

A detailed analysis of reviewers' comments was conducted. Ultimately, the acceptance process roughly corresponded to accepting the top 278 ranked papers, though some exceptions were made based on the judgment of the organizing committee and the special session chairs. The overall assessment was that the set of accepted papers was of very good quality.

Based on cross-checks with registration, payment, copyright, and proof of student status information, final uploaded papers were screened for formatting quality and, following some iteration with paper authors, the final set of 263 reviewed papers was confirmed in June 2006. With the addition of eight non-reviewed invited papers, the FUSION 2006 proceedings include 271 papers.

The conference program included three morning plenary sessions, 51 technical sessions, and a single poster session on the afternoon of Wednesday 12 July 2006. In June 2006, all members of the TPC as well as additional individuals (mostly from government organizations) were asked if they would be willing to serve as session chairs. Considerable effort went into organizing the program so as to avoid conflicts among presentation and session-chairing duties, as well as to minimize conflicts among sessions of similar technical interest. For the first time, due to the record number of papers, the FUSION program featured six parallel technical sessions.

## **2.5 A formal complaint**

Very few complaints were received throughout the planning and preparation of FUSION 2006. In all cases, outstanding issues were successfully resolved. There is one exception to this, which is cited here for completeness.

In May 2006, Ron Mahler contacted the organizing committee to complain about the technical reviews associated with his paper, as well as the disposition of two papers that referenced his work. The text of this complaint is given in figure 2.4. Dr. Mahler asked to remove his paper from the technical program, and proceeded to cancel his conference registration and payment. The organizing committee attempted to convince Dr. Mahler to rescind his decision, by pointing out that: (1) not all reviewers are experts in the fine technical details of the papers they are asked to review; (2) all three papers in question had in fact been accepted for presentation at FUSION 2006; and (3) two of the papers had been tentatively assigned to the poster session based solely on the fact that they were student papers. (In fact, one of these poster-session papers was ultimately selected as the best student paper, and was presented at the third plenary session to the full body of FUSION 2006 attendees.)

Although the organizing committee was not successful in having Dr. Mahler rescind his decision to withdraw from the conference, it stands by the quality of the TPC and the high standards and significant efforts associated with the coordination and execution of the paper review process.

## 2.6 The best papers

Following the paper review process, in early June 2006 the organizing committee assembled an awards committee, to which it gave a selection of the best-scoring papers: four candidates for best paper, and four candidates for best student paper (for which the lead author was required to be a full-time student). The selection of candidate papers was determined by Craig Carthel, Stefano Coraluppi, and Peter Willett. Subsequently, five members of the awards committee were charged with ranking the four best paper candidates, and four members were charged with ranking the four best student paper candidates.

The evaluations provided by members of the awards committee led to a tie for best paper, and the selection of a best student paper. The co-recipients of the FUSION 2006 best paper award were the following:

- M. Ulmke and W. Koch, *Road Map Extraction using GMTI Tracking*;
- Y. Boers and H. Driessen, *The PMHT and Related Applications of Mixture Densities*.

The best student paper was awarded to the following:

- A. Pasha, B.N. Vo, H.D. Tuan, W.K. Ma, *Closed Form PHD Filtering for Linear Jump Markov Models*.

These papers were presented at plenary sessions and the authors were recognized with award certificates. Honorable mention goes to the other papers that were considered for these awards. They are the following:

- George Moustakides, *Decentralized CUSUM Change Detection*;
- Gregor Pavlin and Jan Nunnick, *Inference Meta Models: Towards Robust Information Fusion with Bayesian Networks*;
- S. Tilie, L. Laborelli, and I. Bloch, *Blotch Detection for Digital Archives Restoration based on the Fusion and Spatial and Temporal Detectors*;
- A. Alcocer, P. Oliveira, A. Pascoal, and J. Xavier, *Estimation of Attitude and Position from Range-Only Measurements using Geometric Descent Optimization on the Special Euclidean Group*;
- T. Dixon, J. Li, J. Noyes, T. Troscianko, S. Nikolov, J. Lewis, E. Canga, D. Bull, and C. Canagarajah, *Scanpath Analysis of Fused Multi-Sensor Images with Luminance Change: A Pilot Study*.

## 2.7 Conference proceedings

After considering a number of US-based and Italy-based publication options, the organizing committee in consultation with the NURC library services staff decided to produce the CD-ROM proceedings at NURC. These proceedings are indexed as follows: *Proceedings of the 9<sup>th</sup> International Conference on Information Fusion*, ©2006 IEEE ISIF, ISBN 0-9721844-6-5, IEEE Catalog No. 06EX1311C.

The printing of the CD-ROM labels was arranged through Express Europe srl ([www.duplicazionecd.org](http://www.duplicazionecd.org)). The printing of additional conference-related materials (program booklets, badges, notepads, tickets for social events, menu and concert booklets, tutorial notes, conference venue banners and placards, certificates of attendance, award certificates, etc.) arranged externally through the conference secretariat, DGMP.



## 2.8 Related events

A number of related meetings were held in conjunction with FUSION 2006. These events were covered under the conference budget, with the understanding that all participants at these events be registered attendees at the conference. Thus, the coordinated planning proved to be beneficial to all parties. The related events were the following:

- *AFOSR Information Fusion Program Workshop* (10-11 July 2006, *Convitto della Calza*, approximately 30 participants);
- *IEEE AEES Target Tracking Systems Panel* (10 July 2006, *Convitto della Calza*, approximately 12 participants);
- *ISIF BoD meeting* (13 July 2006, *Ristorante Boccanegra*, 20 participants);
- *3<sup>rd</sup> Meeting of the Multistatic Tracking Working Group* (14 July 2006, *Convitto della Calza*, approximately 20 participants).

By all accounts, the arrangements made seem to have been acceptable both to the meeting participants and to the conference itself.

## 2.9 Sponsorship

FUSION 2006 benefitted from the support of a number of sponsors. Technical sponsorship was provided by the following organizations:

ISIF – International Society of Information Fusion  
([www.isif.org](http://www.isif.org))



IEEE – Institute of Electrical and Electronic Engineers  
([www.ieee.org](http://www.ieee.org))



IEEE AEES – IEEE Aerospace and Electronic Systems  
([www.ewh.ieee.org/soc/aes](http://www.ewh.ieee.org/soc/aes))



NURC – NATO Undersea Research Centre  
([www.nurc.nato.int](http://www.nurc.nato.int))



Financial sponsorship was provided by the following organizations:

ONR – Office of Naval Research  
([www.onr.navy.mil](http://www.onr.navy.mil))



ONRG – ONR Global  
([www.onrglobal.navy.mil](http://www.onrglobal.navy.mil))



BAE Systems Advanced Information Technologies  
([www.alphatech.com](http://www.alphatech.com))





EOARD – AFOSR European Office of Aerospace Research and Development  
([www.london.af.mil](http://www.london.af.mil))



Selex – Sistemi Integrati ([www.selex-si.com](http://www.selex-si.com))

**SELEX**  
Sistemi Integrati

Finmeccanica ([www.finmeccanica.it](http://www.finmeccanica.it))



TNO – The Netherlands Organisation for Applied Sciences  
([www.tno.nl](http://www.tno.nl))



The total sponsorship amount was about €21K. The FUSION 2006 organizing committee expresses its sincere gratitude to all its technical and financial sponsors, who have contributed greatly to the success of the conference.

## **2.10 Travel and accommodations**

Arrangements for travel to Florence as well as for accommodations during the week were the responsibility of conference attendees. Links to several discount carriers were given on the FUSION 2006 website. Additionally, the website included a listing of suggested hotels with negotiated rates, map information, and a mechanism for reservation through DGMP. All transactions were at arms' length, and attendees were encouraged to visit the travel companies' and hotels' websites to compare rates.

## **2.11 Welcome messages**

The FUSION 2006 technical program booklet was distributed to all attendees at the *Convitto della Calza*; the program cover page is illustrated in figure 2.5. It contained a welcome from the Stefano Coraluppi and Peter Willett (General Chairs) that is reproduced in figure 2.6.

FUSION 2006 also featured welcome addresses at the *Convitto della Calza* by Alfonso Farina (Executive Chair) and Steven Ramberg (NURC Director), and at *Palazzo Vecchio* by Alberto Baldacci (Local Arrangements and Finance Chair) and *Assessore* Eugenio Giani (member of the Florence City Council).

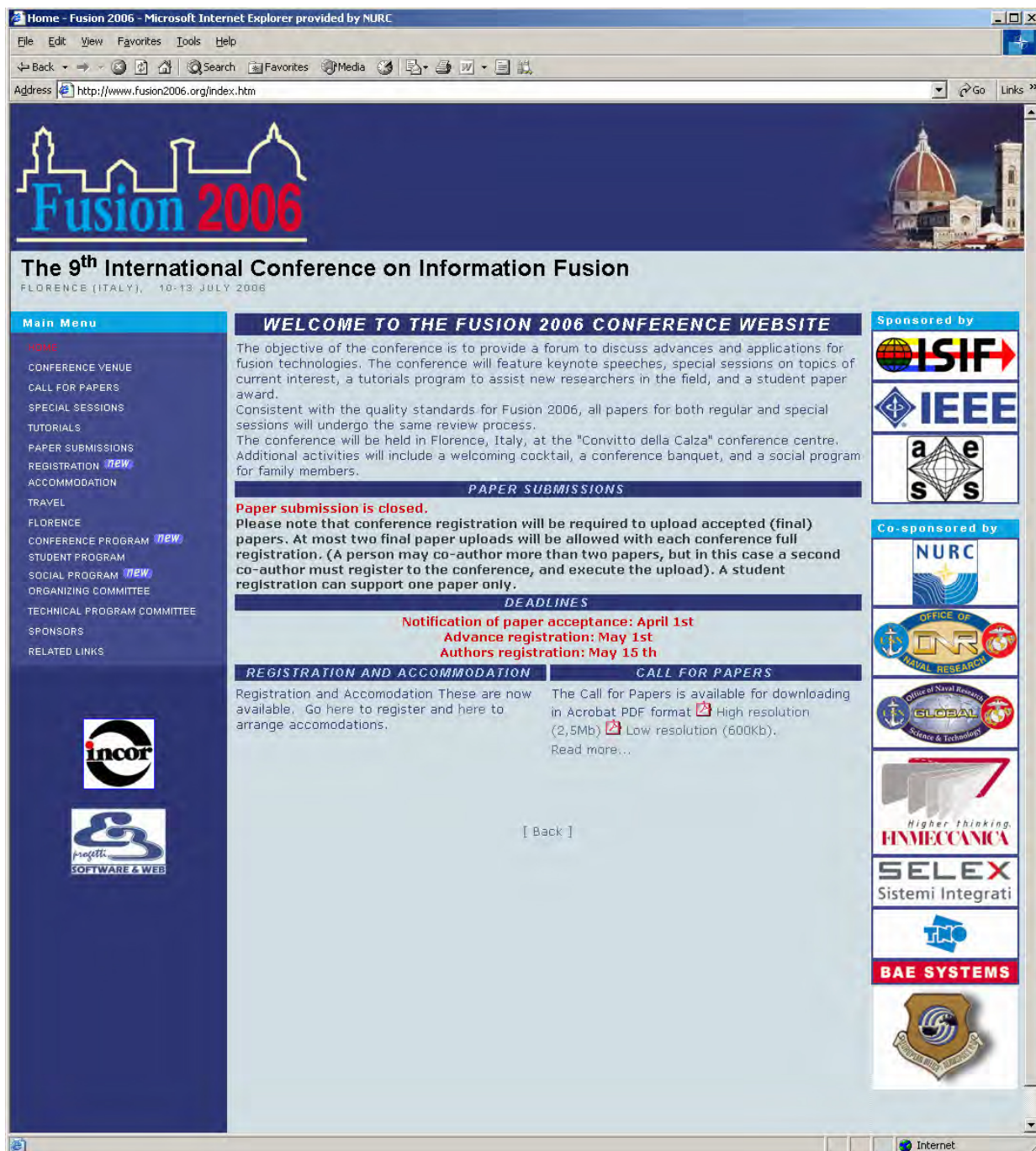
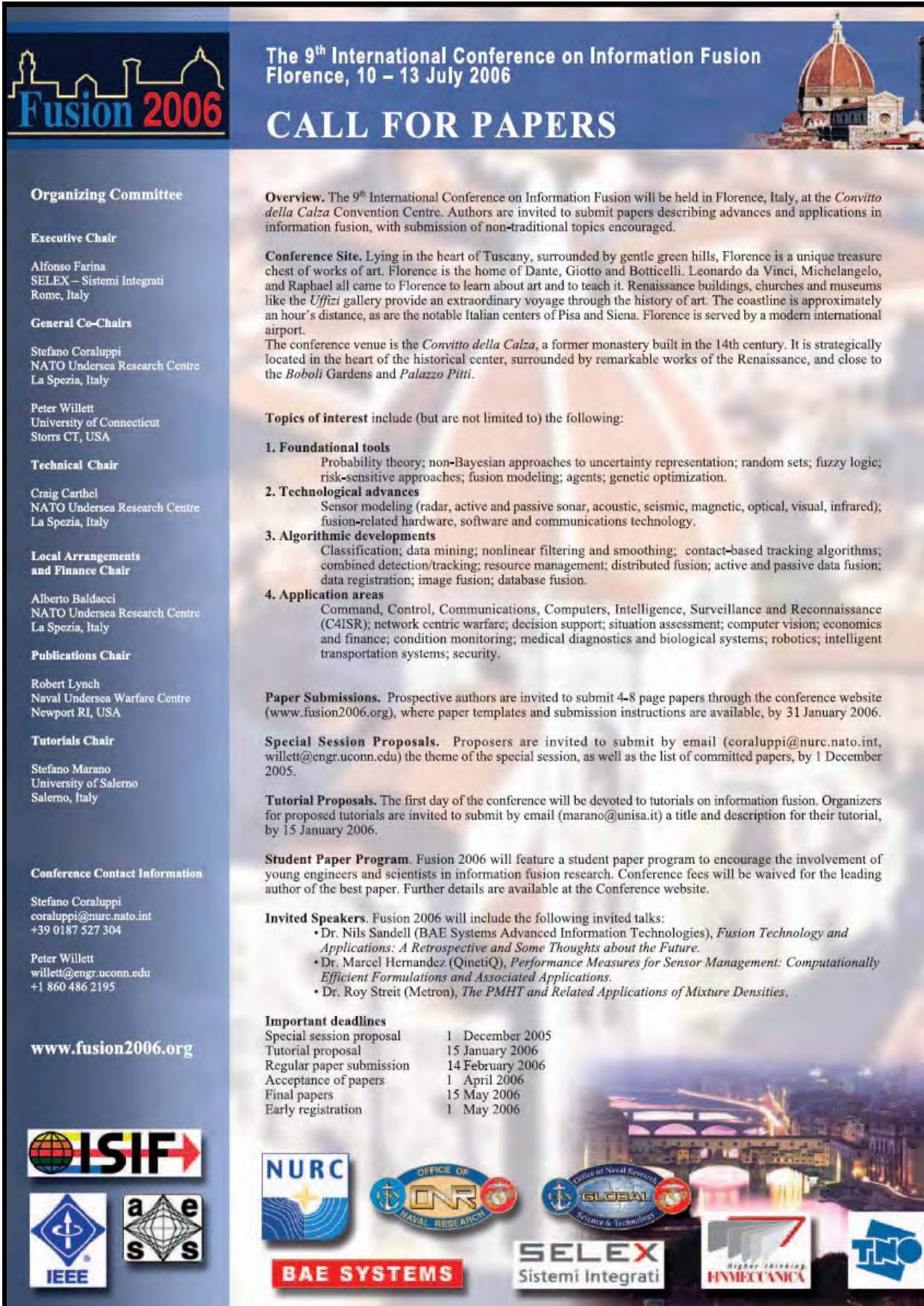


Figure 2.1 The FUSION 2006 website ([www.fusion2006.org](http://www.fusion2006.org)) went online before the start of FUSION 2005 in Philadelphia.





**Fusion 2006**

The 9<sup>th</sup> International Conference on Information Fusion  
Florence, 10 – 13 July 2006

## CALL FOR PAPERS

**Organizing Committee**

**Executive Chair**

Alfonso Farina  
SELEX – Sistemi Integrati  
Rome, Italy

**General Co-Chairs**

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NATO Undersea Research Centre  
La Spezia, Italy

Peter Willett  
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**Technical Chair**

Craig Carthel  
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**Local Arrangements and Finance Chair**

Alberto Baldacci  
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**Publications Chair**

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[www.fusion2006.org](http://www.fusion2006.org)

**Overview.** The 9<sup>th</sup> International Conference on Information Fusion will be held in Florence, Italy, at the *Convitto della Calza* Convention Centre. Authors are invited to submit papers describing advances and applications in information fusion, with submission of non-traditional topics encouraged.

**Conference Site.** Lying in the heart of Tuscany, surrounded by gentle green hills, Florence is a unique treasure chest of works of art. Florence is the home of Dante, Giotto and Botticelli. Leonardo da Vinci, Michelangelo, and Raphael all came to Florence to learn about art and to teach it. Renaissance buildings, churches and museums like the *Uffizi* gallery provide an extraordinary voyage through the history of art. The coastline is approximately an hour's distance, as are the notable Italian centers of Pisa and Siena. Florence is served by a modern international airport.

The conference venue is the *Convitto della Calza*, a former monastery built in the 14th century. It is strategically located in the heart of the historical center, surrounded by remarkable works of the Renaissance, and close to the *Boboli Gardens* and *Palazzo Pitti*.

**Topics of interest** include (but are not limited to) the following:

- 1. Foundational tools**  
Probability theory; non-Bayesian approaches to uncertainty representation; random sets; fuzzy logic; risk-sensitive approaches; fusion modeling; agents; genetic optimization.
- 2. Technological advances**  
Sensor modeling (radar, active and passive sonar, acoustic, seismic, magnetic, optical, visual, infrared); fusion-related hardware, software and communications technology.
- 3. Algorithmic developments**  
Classification; data mining; nonlinear filtering and smoothing; contact-based tracking algorithms; combined detection/tracking; resource management; distributed fusion; active and passive data fusion; data registration; image fusion; database fusion.
- 4. Application areas**  
Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR); network centric warfare; decision support; situation assessment; computer vision; economics and finance; condition monitoring; medical diagnostics and biological systems; robotics; intelligent transportation systems; security.

**Paper Submissions.** Prospective authors are invited to submit 4-8 page papers through the conference website ([www.fusion2006.org](http://www.fusion2006.org)), where paper templates and submission instructions are available, by 31 January 2006.

**Special Session Proposals.** Proposers are invited to submit by email ([coraluppi@nure.nato.int](mailto:coraluppi@nure.nato.int), [willett@engr.uconn.edu](mailto:willett@engr.uconn.edu)) the theme of the special session, as well as the list of committed papers, by 1 December 2005.

**Tutorial Proposals.** The first day of the conference will be devoted to tutorials on information fusion. Organizers for proposed tutorials are invited to submit by email ([marano@unisa.it](mailto:marano@unisa.it)) a title and description for their tutorial, by 15 January 2006.

**Student Paper Program.** Fusion 2006 will feature a student paper program to encourage the involvement of young engineers and scientists in information fusion research. Conference fees will be waived for the leading author of the best paper. Further details are available at the Conference website.

**Invited Speakers.** Fusion 2006 will include the following invited talks:

- Dr. Nils Sandell (BAE Systems Advanced Information Technologies), *Fusion Technology and Applications: A Retrospective and Some Thoughts about the Future*.
- Dr. Marcel Hernandez (QinetiQ), *Performance Measures for Sensor Management: Computationally Efficient Formulations and Associated Applications*.
- Dr. Roy Streit (Metron), *The PMHT and Related Applications of Mixture Densities*.

**Important deadlines**

Special session proposal	1 December 2005
Tutorial proposal	15 January 2006
Regular paper submission	14 February 2006
Acceptance of papers	1 April 2006
Final papers	15 May 2006
Early registration	1 May 2006

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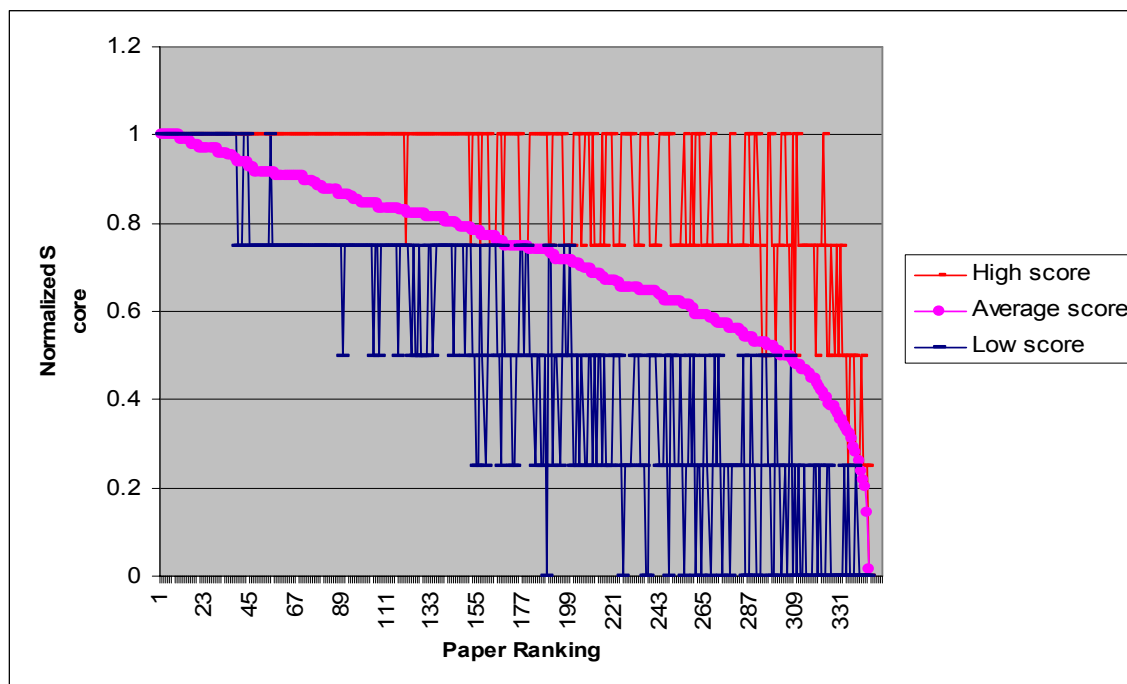
**BAE SYSTEMS**

**SELEX Sistemi Integrati**

**HIGHER THINKING FINMECCANICA**

**TNO**

Figure 2.2 The FUSION 2006 Call for Papers was first distributed at FUSION 2005 in Philadelphia.



**Figure 2.3** Reviewed papers exhibit rapid decline in average score after the top 300.

Dear Dr. Carthel:

I am lodging a complaint regarding the disposition of the following papers, and am also withdrawing the first one in protest:

1. Mahler, "Higher-Order Multitarget-Moment Filters" (Tartakovsky's session)
2. Vo, Vo, Cantoni, "Performance of PHD based multi-target filters" (poster 1)
3. Clark, Panta, Vo, "The GM-PHD filter multiple target tracker" (poster 2)

Paper [1] got one strong and two weak accepts. All three reviewers wanted to see simulations. Reviewer 3 argued that [1] was not pertinent to the conference because "it does not address any fusion problem." Reviewer 3 issued the following (alleged) technical objection: "it is very difficult to operate with general point processes. I thought that this fact has been admitted by a target detection community a long time ago [sic]."

**Point 1:** Reviewer 3 claims that my use of more general point processes is impossible because the conventional wisdom deems it so. *Shouldn't the paper have constituted a major contribution by revealing the C.W. to be wrong?* He is also putting words in my mouth—e.g., I use *generalized Poisson* point processes, not *general* point processes.

**Point 2:** *How can [1] not be fusion-pertinent?* It encompasses two basic aspects of fusion: multitarget detection & tracking and multiple sensors. It is a response to a critique of my PHD filter presented at FUSION05 by Erdinc, Willett, and Bar-Shalom. Since [1] successfully addresses concerns voiced by major fusion researchers at FUSION05, isn't it inherently pertinent? Shouldn't [1-3] all be pertinent given that I was a plenary speaker at FUSION04 in large part because of the PHD filter's notoriety?

**Point 3:** [1] is a theoretical paper, written in response to the solicitation for "Foundational Tools" in the Call for Papers. It did not need to compare techniques.

**Point 4:** *This was, however, precisely the purpose of [2],* and I was counting on it being given in an oral presentation for that reason. The authors of [2] show that the new CPHD filter has much better performance than the PHD filter. Yet [2] has been relegated to a poster session! According to Prof. Vo, [2] got one strong and one weak accept, and one reject. One reviewer claimed, once again, that [2] was not fusion-pertinent. Another claimed it to be pointless since it showed the CPHD filter to be only slightly better than the PHD filter—the *exact opposite of what [2] actually shows.*

**Point 5:** [3] is also too important to have been relegated to a poster session. It describes a fast PHD filter implementation.

It is a disgrace that three good papers have been so shabbily treated by reviewers who are apparently slapdash, arbitrary, and/or incompetent.

Sincerely, Ronald Mahler

**Figure 2.4** A formal complaint was received on 26 May 2006.





Figure 2.5 The conference program was distributed to all FUSION 2006 attendees.

La Spezia and Stoors, 19 June 2006

Welcome to FUSION 2006 and Florence – one of the loveliest cities in the world. We hope you have a technically rewarding experience as well as some memorable times spent in sightseeing, absorbing Florence’s history and culture, and of course eating and drinking the wonderful things that Tuscany has to offer.

As we write this, we must speak in the future tense of things that are expected, rather than in the past tense of pleasant memories.

- We have quite carefully chosen the Convitto della Calza as our conference venue: we expect that you will look at its single door from the street and wonder if you have misunderstood the directions; but we hope that once you enter its beautiful courtyard you will be as thrilled as we were. There are several conference sites in Florence that were offered to us, but the Convitto’s history of good conferences, its location and especially its *Italianness* made it our first choice. One of our least-onerous pre-conference duties was several fact-finding visits to the Convitto to sample its food (lunch & coffee) and service when other groups affiliated with our conference organizer have been present. We hope that you will be as happy with the Convitto as we have been.
- Many conferences host their welcome reception prior to their onsets – often the evening prior to the first session. We have found attendance at such affairs unpredictable, since many attendees arrive late that night. Since we will host ours at the gorgeous Palazzo Vecchio – and we really want everyone to be able to experience that – we have decided to hold ours at the close of the first day of the conference, on Tuesday July 11. Preceding the cocktail and hors-d’oeuvres we will be treated to a concert from one of our own, world-class pianist (and FGAN researcher) Richard Klemm.
- Much of the beauty of Florence is downtown: the Palazzo Vecchio, the Boboli Gardens, the Ponte Vecchio, the Uffizi art gallery, the Duomo and the Accademia (home to Michelangelo’s “David”). We have opted to offer one experience that is slightly different: our conference banquet is to be at the Villa dell’Ombrellino, a mansion up on the hills that overlook Florence from the south. We trust that the view of central Florence from Villa’s gardens will make an impression, and we hope that the necessary uphill bus ride to the Villa will be excused. Since the banquet will be in several rooms we have chosen not to have a banquet speaker; instead, we are grateful to Marion Ceruti from SPAWAR who has offered to give a mandolin concert during the cocktail time.

We have tried to plan a conference that will be technically, culturally and gastronomically filling, and we hope that you will be able to agree (in the past tense) that it was.

We believe we have an extraordinary technical program, thanks to the Program Committee chaired by Dr. Craig Carthel and his volunteer reviewers. Some numbers: there were 159 members of the Technical Program Committee (TPC), along with 24 additional reviewers; a record 345 papers were submitted, and 263 of these were accepted for publication in the conference proceedings; most papers submitted received three reviews (in all cases at least two), for a total of 961 technical reviews; additionally there were 8 invited papers, including 7 position papers for the panel discussion chaired by Ivan Kadar, and a paper to accompany the plenary presentation by Roy Streit. Twelve members of the TPC participated also in the Awards Committee, which selected the Best Student Paper (A. Pasha, B. Vo, H.D. Tuan, and W.-K. Ma, *Closed Form PHD Filtering for Linear Jump Markov Models*) and the co-recipients of the Best Paper Award (M. Ulmke and W. Koch, *Road Map Extraction using GMTI Tracking*, and Y. Boers and J.N. Driessen, *A Track Before Detect Approach for Extended Objects*). We are especially grateful to our plenary speakers: Drs. Marcel Hernandez from Qinetiq, Nils Sandell from BAE Systems Advanced Information Technologies and Roy Streit from Metron.

As with past FUSION conferences, we have been fortunate to have been supported by many who have organized invited sessions – about 40% of our papers are in these sessions. (It is probably worth mentioning that these papers are subject to the same strict review process that all papers receive.) We would like to thank our special-session organizers: Ivan Kadar (a large panel discussion: “Issues and Challenges in Resource Management and its Interaction with Level 2/3 Fusion with Applications to Real-World Problems”); Doug Grimmatt (three sessions on multistatic sonar); Mitch Kokar, Mark Oxley & Steven Thorsen (two sessions on category theory); Alexander Tartakovsky & Paul Singer (two sessions on distributed decision-making); Stavri Nikolov and Lex Toet (two sessions on image fusion assessment); Jesús García Herrero and José M. Molina (intelligent systems); Mahendra Mallick (two sessions on ground target tracking); Jim Llinas (network-centric warfare); Marion Ceruti (tracing pedigree); Paul Cohen (making histories); Robert Johnston and Nick Jennings (autonomous agents) and Gabriel Jakobson, Lundy Lewis and John Salerno (two sessions on situation management). We have a special note of thanks, too, to Patrick Vannoorenberghe and Thierry Denoeux for organizing a very special session: “Belief Functions: In Memory of Philippe Smets” to honor one of our Society’s pioneers.

**Figure 2.6** *The General Chairs welcomed all FUSION 2006 attendees to Florence.*

We have been fortunate, also, to have received support either financially or technically (and in many cases: both) from a number of sources. We must begin, of course, with ISIF and the AES society from IEEE, our prime sponsors; however, ONR, ONR Global, Selex – Sistemi Integrati, Finmeccanica, BAE Systems, TNO, AFOSR's European Office of Aerospace Research and Development, and of course NATO's Undersea Research Center have all been extremely generous. We have also been delighted to have been able to host AFOSR's Information Fusion Program Workshop (organized by John Tangney) – the presence of the AFOSR group has not only enhanced our technical program, but has also contributed to our ability to put on a nice conference.

We are indebted to the many people who have helped with this conference. We have been very pleased by the professionalism, creativity and accessibility of Conference Organizer DGMP, and we would like warmly to thank Veronica Chiaverini, Elena Antoni and especially Graciela Stiavetti. Tutorials Chair Stefano Marano has put together a strong program of tutorials, and has also helped significantly with duties outside his normal range, specifically involving the procurement of visas for some of our overseas visitors. Our Publications Chair Bob Lynch has continued his work in putting together a well-organized Proceedings – we are not sure if many people who attend conferences know how much work (some of it quite demanding, and almost all of it contained in a month or so crescendo of effort) is involved in this set of duties, and we have been happy that he has consented to reprise his role as FUSION Publications Chair – despite his having done it before. Executive Chair Alfonso Farina has provided excellent visibility for the conference through his advertising efforts; this has contributed to the record levels we have achieved in paper submissions and conference registrations.

We are in awe of Technical Program Chair Craig Carthel's work for this conference. As you can certainly imagine, managing the reviews – and each a detailed technical review – for 345 papers is a frightening task. As you can probably imagine, organizing the overall technical program into sessions that, as far as we can tell, offer very few "two places at the same time" conflicts (not only presentation commitments but also sessions simply of similar technical interest) is perhaps provably NP-hard. As you can perhaps intuit, dealing with the inevitable special-case concerns from many authors (some of them ruffled by negative review decisions or perplexed by registration) can be uncomfortable. But you may not be aware that Craig did much of the web-programming work himself – the web-submission process was coordinated at "carthel.com", and that is no accident.

Finally, we are extremely grateful for the efforts of Local Arrangements and Finance Chair Alberto Baldacci. Any attempt here to express our appreciation for his work will be inadequate. Alberto has been the prime mover in essentially all our logistical decisions, the layout of our website and call for papers, our social affairs, our locations, and our attempts to help you, our audience, love Florence as much as we do. Also, Alberto has shouldered a huge portion of the budgeting work that is, well, not a lot of fun. Without Alberto there would be no conference.

We, your organizing committee, have participated in many of the past FUSION conferences. We have always found these conferences technically rewarding: people tend to present their dearest ideas to their closest colleagues at FUSION conferences, and, perhaps unlike many other conference venues, the discussions tend to be spirited and rather fun. Our decision to volunteer to organize this conference came about, in part, by a desire to contribute to and to be part of such activities. But the other key is that FUSION conferences are usually an *experience*: they have been social, close-knit and always a journey to a remarkable place. We hope that we have been able to continue in this tradition; certainly the charms of Florence ought to have captivated you, and we hope that we have been able to help you appreciate her.

Stefano Coraluppi  
NATO Undersea Research Centre (La Spezia, Italy)  
FUSION 2006 General Co-Chair

Peter Willett  
University of Connecticut (Storrs CT, USA)  
FUSION 2006 General Co-Chair

**Figure 2.6** (continued) *The General Chairs welcomed all FUSION 2006 attendees to Florence.*

### 3 Organizing committee

The FUSION 2006 organizing committee is shown in figure 3.1, in the courtyard at the *Convitto della Calza*.



**Figure 3.1** The FUSION 2006 organizing committee included (from left) Craig Carthel, Stefano Marano, Peter Willett, Robert Lynch, Alfonso Farina, Stefano Coraluppi, and Alberto Baldacci.

#### 3.1 Executive chair: Alfonso Farina

**Alfonso FARINA** (Fellow of IEEE, Fellow of Royal Academy of Engineering, and Fellow of IEE) received his doctor degree in electronic engineering from the University of Rome (I) in 1973. In 1974 he joined Selenia, now SELEX – Sistemi Integrati, where he is a manager (since May 1988). He was Scientific Director in the Chief Technical Office. Today he is director of the Analysis of Integrated Systems Group. In his professional life Alfonso has provided technical contributions to detection, signal, data & fusion, image processing for radar systems. He has provided leadership in many projects – also conducted in the international arena – in surveillance for ground and naval applications, in airborne early warning and in imaging radar. Since 1979, he has also been *Professore Incaricato* of Radar Techniques at the University of Naples; in 1985 he was appointed Associate Professor. He is the author of more than 350 peer reviewed technical publications and the author of books and monographs: *Radar Data Processing (Vol. 1 and 2) (translated in Russian and Chinese)*, 1985-1986; *Optimised Radar Processors*, 1987; *Antenna Based Signal Processing Techniques for Radar Systems*, 1992. He has written the Chapter 9 on “ECCM techniques” in the Radar Handbook (2<sup>nd</sup> Edition 1990), edited by Dr. M. I. Skolnik of Naval Research Laboratory. He has been session chairman at many international radar conferences. He lectures at universities and research centres in Italy and abroad; He also frequently gives tutorials at the Intl. Radar Conferences on signal, data and image processing for radar; in particular on multi-sensor fusion, adaptive signal processing,



space time adaptive processing (STAP) and detection. In the 1987 He received the Radar Systems Panel Award of IEEE-AESS *for development of radar data processing techniques*. He is the Italian representative at the International Radar Systems Panel of IEEE-AESS. He is the Italian industrial representative (Panel Member at Large) at the SET (Sensor and Electronic Technology) of RTO (Research Technology Organisation) of NATO. He has been in the BoD of the International Society for Information Fusion (ISIF). He is the executive chair of the International Conference on Information Fusion, Fusion 2006 (Florence, 10-13 July 2006). He has been nominated Fellow of IEEE with the following citation: *"For development and application of adaptive signal processing methods for radar systems."* Recently he has been nominated international fellow of the Royal Academy of Engineering (UK). He is a referee of numerous publications submitted to several Journals of IEEE, IEE, Elsevier, etc., He has also cooperated with the editorial board of ECEJ (Electronics & Communication Engineering Journal) of IEE. More recently, Alfonso has served as a member in the Editorial Board of Signal Processing (Elsevier). Also he has been the co-guest editor of the Signal Processing (Elsevier) special issue on "New trends and findings in antenna array processing for radar", September 2004. He is the co-recipient of the following best paper awards: entitled to Mr. B. Carlton, of IEEE Trans. on Aerospace and Electronic Systems for the years 2001 and 2003; also of the International Conference on Fusion 2005. Alfonso has been the leader of the team that received the 2002 AMS CEO award for Innovation Technology. Alfonso has been the co-recipient of the AMS Radar Division award for Innovation Technology in 2003. Moreover, Alfonso has been the co-recipient of the 2004 AMS CEO award for Innovation Technology. Recently, He has been the leader of the team that has won in 2004 the 1<sup>st</sup> prize award for Innovation Technology of Finmeccanica (Italy). This award context has seen the submission of more than 320 projects. This award has been set for the first time in 2004.

### **3.2 General chairs: Stefano Coraluppi and Peter Willett**

**Stefano Coraluppi** is a Senior Scientist in the Reconnaissance, Surveillance, and Networks Department at the NATO Undersea Research Centre in La Spezia, Italy, where he works on data fusion and target tracking for maritime surveillance networks. He received his BS in Electrical Engineering and Mathematics from Carnegie Mellon University in 1990, and his MS and PhD in Electrical Engineering from the University of Maryland in 1992 and 1997, respectively, focusing on estimation and control theory. From 1997 to 2002, he was a Senior Research Engineer at ALPHATECH Inc. in Burlington MA, where he worked on multisensor fusion and tracking for ground surveillance. He is an associate editor for target tracking and multisensor systems for the IEEE Transactions on Aerospace and Electronic Systems.

**Peter Willett** is a Professor of Electrical and Computer Engineering at the University of Connecticut. Previously he was at the University of Toronto, from which he received his BAsC in 1982, and at Princeton University from which he received his PhD in 1986. He is a Fellow of the IEEE, and editor in chief for the IEEE Transactions on Aerospace and Electronic Systems, associate editor for the International Society for Information Fusion Journal of Advances in Information Fusion (ISIF-JAIF) and was AE for the IEEE AESS Systems magazine and for IEEE Transactions on Systems, Man, and Cybernetics (both parts A and B). He is a member of the IEEE Signal Processing Magazine's editorial board. He was a track organizer for Remote Sensing at the IEEE Aerospace Conference (2001-2003), and was co-chair of the Diagnostics, Prognosis, and System Health Management SPIE Conference in Orlando. He served as Program Co-Chair for the 2003 IEEE Systems, Man & Cybernetics Conference in Washington, DC.

### **3.3 Technical chair: Craig Carthel**

**Craig Carthel** is a Senior Scientist in the Command and Operational Support Department at the NATO Undersea Research Centre in La Spezia, Italy, where he works on military operations research, simulation, optimization, and target tracking. He received BS degrees in Physics and Mathematics in 1988, a MS in Mathematics in 1992, and a PhD in Mathematics in 1995, all from the University of Houston, where he did research in numerical analysis and optimization theory. From 1995 to 1997, he worked at the Institute for Industrial Mathematics at Johannes Kepler University, in Linz, Austria on parameter identification and inverse problems. From 1998 to 2002, he was a Senior Mathematician at ALPHATECH Inc. in Burlington MA, where he worked on image processing, multisensor data fusion and ground target tracking.

### **3.4 Local arrangements and finance chair: Alberto Baldacci**

**Alberto Baldacci** is a Scientist the Reconnaissance, Surveillance, and Networks Department at the NATO Undersea Research Centre in La Spezia, Italy. He graduated in Telecommunication Engineering and received his PhD in Information Engineering from the University of Pisa in 1997 and 2000, respectively. During this period his research focused on remote sensing for oceanography. In 1999 he worked for the Italian Navy on the analysis of infrared video sequences for target detection and recognition. He is currently working on signal processing architectures and algorithms for low frequency active sonar applications, such as broadband environmentally adaptive sonar and multistatic sonar.

### **3.5 Publications chair: Robert Lynch**

**Robert Lynch** is a senior electronics engineer with the Naval Undersea Warfare Center in Newport, RI, where he is involved in the research and development of sonar systems. In 1984 and 1991, respectively, he received BS and MS degrees, both in Electrical Engineering, from Union College in Schenectady, NY. In 1999 he received a PhD in Electrical Engineering from the University of Connecticut, Storrs, CT. His research interests are in the areas of pattern recognition and classification, detection, data fusion, tracking, and signal processing. In addition to the IEEE he is also a member of the International Society of Information Fusion (ISIF), and is an associate member of the Sensor, Array, and Multichannel (SAM) Technical Committee. Dr. Lynch is an Associate Editor of the IEEE Transactions on Systems, Man, and Cybernetics Part B, Cybernetics.

### **3.6 Tutorial chair: Stefano Marano**

**Stefano Marano** received the Laurea degree in Electronic Engineering (cum laude) and the PhD degree in Electronic Engineering and Computer Science both from the University of Naples, Italy, in 1993 and 1997, respectively. Since January 2005 he was appointed the permanent position of Associate Professor at the University of Salerno, where he was formerly Assistant Professor (since November 1999). His current research interests include: detection and estimation theory with emphasis on sequential and decentralized techniques; data fusion; sensor networks, stochastic modeling of electromagnetic propagation in random media. About these and related topics he has (co-)authored about 70 papers, including some invited, mainly on international journals/transactions and proceedings of international conferences. Dr. Marano serves as referee for the main international Journals active in the field of Signal Processing. He his co-recipient of the S. A. Schelkunoff Transactions Prize Paper Award of the IEEE Antennas and Propagation Society for the best paper published in the Transactions in 1999.

## 4 Technical program support

The technical quality of FUSION 2006 relied upon considerable support to the organizing committee. This included TPC members, the awards committee, additional reviewers, special session organizers, and session chairs. Full lists are provided below. There were 159 TPC members, 12 award committee members, 24 additional reviewers, 13 special session topics, and 56 chairs to cover three plenary sessions, 51 technical sessions, and one poster sessions (some sessions had multiple chairs, and some chairs covered multiple sessions).

### 4.1 Technical program committee members

Parham Aarabi	Odile Gerard	Brian La Cour
Douglas Abraham	Angelo Giannopoulos	Barbara La Scala
Angelos Amditis	Fulvio Gini	Georgiy Levchuk
Sten F. Andler	Kai Goebel	Lundy Lewis
Alain Appriou	Neil Gordon	J-Pierre Le Cadre
Stefan Arnborg	Raffaele Grasso	James Llinas
Alberto Baldacci	John E. Gray	Mark Luetzgen
Yaakov Bar-Shalom	Eric Gregoire	Tod E. Luginbuhl
Robert Been	Patrick Grignan	K. Lukin
Salem Benferhat	Doug Grimmitt	Robert S. Lynch
Philippe Besnard	Fredrik Gustafsson	Luis Magdalena
Dale Blair	Irene Gu	Ronald Mahler
Wayne Blanding	David Hall	Mahendra Mallick
Erik P. Blasch	Chongzhao Han	Stefano Marano
Yvo Boers	Marcel Luis Hernandez	Simon Maskell
Eloi Bosse	Jesús García Herrero	Mike McDonald
Karna Bryan	Michael L. Hinman	Lyudmila Mihaylova
Agostino Capponi	Sun-Mog Hong	Nada Milisavljevic
Jaroslav Cechak	David Hughes	Jose M. Molina
Marion Ceruti	Anthony Hunter	Ignacio Montiel
KuoChu Chang	Gabriel Jakobson	Darko Musicki
Biao Chen	Nick Jennings	Vince Myers
Paul Cohen	Stephane Jaspers	Gee Wah Ng
Stefano Coraluppi	Zhongliang Jing	David Nicholson
David Bruce Cousins	Jason K Johnson	Lars Niklasson
Subrata Das	Robert Johnston	Stavri Nikolov
Rami Debouk	Anne-Laure Joussetme	Ruixin Niu
Thierry Denoeux	Erland Jungert	Karl Erik Olsen
Jean Dezert	Ivan Kadar	Yaakov Oshman
Antonio De Maio	Ronald Kessel	Martin Oxenham
Pascal de Theije	Leon Kester	Mark Edwin Oxley
Arnaud Doucet	Thiagalingam Kirubarajan	Lucy Ya Pao
Darin Dunham	Richard Klemm	Stephen D. Patek
Murat Efe	Wolfgang Koch	Lalit Mohan Patnaik
Frank Ehlers	Mieczyslaw M. Kokar	John Percival
Lisa Ehrman	Sebastien Konieczny	Ramón Pino Pérez
Ozgur Erdinc	Vikram Krishnamurthy	Vladimir Petrovic
Pekka Eskelinen	David Krout	James William Pitton
Rob Evans	Rudolf Kruse	Thierry Ranchin
Alfonso Farina	Anthony Kuh	Nageswara S. V. Rao
Mohammad Farooq	Krzysztof S. Kulpa	Laurent P. Ratton
Warren Fox	Dale Austin Lambert	Roger Reynaud

Branko Ristic	Tzvetan Semerdjiev	Pierre Valin
Galina L. Rogova	Elisa Shahbazian	Patrick Vannoorenberghe
Fabio Roli	Amy Smith-Carroll	Pramod K. Varshney
Jean Roy	Taek Lyul Song	Patrick Verlinde
Yanhua Ruan	Alan Neil Steinberg	R. Viswanathan
Marina Ruggieri	Lawrence D Stone	Michael J Walsh
Firooz A. Sadjadi	Per Svensson	Xuezhi Wang
John Salerno	Egils Sviestins	Peter Willett
Eugene Santos	Alexander G. Tartakovsky	Vitaliy A. Yashchenko
Joachim Schiller	Steven Thorsen	Tom Ziemke
Johan Schubert	Alexander Toet	

#### **4.2 Awards committee members**

Douglas Abraham	Thierry Denoeux	Mahendra Mallick
Yaakov Bar-Shalom	David Hughes	Stefano Marano
Craig Carthel	Jean-Pierre Le Cadre	Branko Ristic
Stefano Coraluppi	Robert Lynch	Peter Willett

#### **4.3 Additional reviewers**

Joe Antonik	Andreas Hansson	Lina Nolin
Sam Blackman	Robert Higgins	Maria Riveiro
Christoffer Brax	Fredrik Johansson	Brad Rhodes
Marcus Brohede	Kennie Jones	Paul Singer
Joao Cabrera	Alexander Karlsson	Moises Sudit
Anders Dahlbom	Tuve Löfström	Pontus Svenson
Keith Davidson	George Moustakides	Richard Tango-Lowy
Per M. Gustavsson	Maria Nilsson	Venugopal V. Veeravalli

#### **4.4 Special session organizers**

- Marion Ceruti (*Tracing Pedigree in a Distributed, Network-Centric Environment*);
- Paul Cohen (*Making Histories*);
- Doug Grimmer (*Multistatic Sonar and Radar Tracking*);
- Jesús García Herrero and José M. Molina (*Intelligent Systems in Data Fusion Engineering*);
- Gabriel Jakobson, Lundy Lewis and John Salerno (*Situation Management: The Issues Solutions and Challenges*);
- Robert Johnston and Nick Jennings (*Autonomous Agents for Data and Information Fusion*);
- Ivan Kadar (*Invited Panel Discussion: Issues and Challenges in Resource Management and its Interaction with Level 2/3 Fusion with Applications to Real-World Problems*);
- Mitch Kokar, Mark Oxley, Steven Thorsen (*Category Theory and Information Fusion*);
- Jim Llinas (*Network-Centric Warfare, Complexity, and Data Fusion*);
- Mahendra Mallick (*Ground Target Tracking and Classification*);
- Stavri Nikolov and Lex Toet (*Image Fusion Assessment*);
- Alexander Tartakovsky, Paul Singer (*Distributed Inference and Decision-Making in Multisensor Systems*);
- Patrick Vannoorenberghe and Thierry Denoeux (*Belief Functions: In Memory of Philippe Smets*).

## 4.5 Session chairs

Alain Appriou	John Fay	Stavri Nikolov
Alberto Baldacci	James Ferry	Martin Oxenham
Robert Been	Doug Grimmett	Mark Oxley
Dale Blair	Jesús García Herrero	Galina Rogova
Erik Blasch	Gabriel Jakobson	John Salerno
Yvo Boers	Nick Jennings	Elisa Shahbazian
Eloi Bosse	Robert Johnston	Paul Singer
Karna Bryan	Ivan Kadar	Amy Smith-Carroll
Craig Carthel	Leon Kester	Roy Streit
Marion Ceruti	Thiagalingam Kirubajan	Egils Sviestins
Stefano Coraluppi	Mitch Kokar	John Tangney
Frederic Dambreville	Brian La Cour	Alexander Tartakovsky
Subrata Das	Lundy Lewis	Pascal de Theije
Keith Davidson	Jim Llinas	Steven Thorsen
Thierry Denoëux	Robert Lynch	Lex Toet
Darin Dunham	Rabinder Madan	Patrick Vannoorenberghe
Murat Efe	Mahendra Mallick	Peter Willett
Alfonso Farina	Lyudmila Mihaylova	Tom Ziemke
Mohammad Farooq	José M. Molina	

## 5 Technical program

The FUSION 2006 conference included a tutorials program, plenary sessions, technical sessions, and a poster session. Further details are provided below. A group photo of participants is given in figure 5.1.

### 5.1 Tutorials

The first day of the conference, Monday 10 July 2006, was devoted to tutorials (in addition to related meetings of the AFOSR and IEEE AESS). Nine tutorials were held:

- Yaakov Bar-Shalom and Thiagalingam Kirubarajan, *Multitarget Tracking and Multisensor Fusion, PART I* (27 attendees);
- Jean Dezert and Florentin Smarandache, *Fusion of quantitative and qualitative information using DSmT* (12 attendees);
- Farina, L. Chisci, A. De Maio, and A. Benavoli, *Knowledge-Based Radar Signal and Data Processing* (11 attendees);
- Yaakov Bar-Shalom and Thiagalingam Kirubarajan, *Multitarget Tracking and Multisensor Fusion, PART II* (21 attendees);
- Subrata Das, *An Integrated Approach to Data Fusion and Decision Support* (15 attendees);
- Mieczyslaw Kokar, *Ontology Based Situation Awareness and High Level Fusion: Methods and Tools* (19 attendees);
- Marco Diani, *Image processing methods in image fusion* (8 attendees);
- Georgios Haralabus, *On SONAR systems and SONAR signal analysis* (9 attendees);
- Katia Sycara and Bin Yu, *Decentralized Coordination of Autonomous Sensor Systems* (21 attendees).

The tutorials were well received, as seen both in the attendance numbers and the positive feedback received during the conference. There were a total of 143 tutorial registrations, an average of roughly 16 per tutorial. (See section 2.3 for details on tutorial attendance rates and revenue sharing.) The tutorial schedule was designed with three sessions of three tutorials each, to maximize attendance possibilities. Figure 5.2 illustrates a tutorial in one of the more picturesque settings.

## **5.2 Attendance numbers and the plenary sessions**

Attendance at FUSION 2006 exceeded the organizing committee's expectations. The numbers were as follows:

- Regular registrations (early rate): 150;
- Regular registrations (full rate): 151;
- Student registrations (early rate): 48;
- Student registrations (full rate): 26;
- Reduced-rate registrations: 5 (special cases, e.g. one-day conference attendees);
- Complimentary registrations: 17 (selected organizing committee members, invited speakers, and sponsors).

There were a total of 397 conference registrations, a record for FUSION conferences. Fortunately, the *Convitto della Calza* has auditorium capacity for 400 attendees, so it did not prove necessary to limit on-site registrations. Certainly, the excellent turnout led to rather full technical sessions, but the group remained within the capacity of the *Convitto*, and conference attendees enjoyed a comfortable (if somewhat warm) conference venue.

There were a number of plenary-session presentations:

- Stefano Coraluppi and Peter Willett (General Chairs), *Opening Remarks* (figure 5.3);
- Steven Ramberg (NURC Director), *Fusion in the Information Age*;
- Alfonso Farina (Executive Chair), *Welcome Address*;
- Sten Andler (Skovde University), *Update on the Skovde Information Fusion Research Program*;
- Yvo Boers (Thales) and Wolfgang Koch (FGAN), *Best Paper Presentations*;
- Ahmed Pasha, *Best Student Paper Presentation*;
- Pierre Valin (ISIF President) and Alexander Jouan (DRDC), *FUSION 2007 Announcement*;
- Marina Grossi (CEO Selex – Sistemi Integrati), *On Data Fusion, Command, and Control* (figure 5.4).
- Yaakov Bar-Shalom (University of Connecticut), *Journal of Advances in Information Fusion (JAIF) Announcement*.

In addition, FUSION 2006 featured the following plenary lectures:

- Marcel Hernandez, *Performance Measures for Sensor Management: Computationally Efficient Formulations and Associated Applications* (figure 5.5);
- Roy Streit, *The PMHT and Related Applications of Mixture Densities*;
- Nils Sandell, *Fusion Technology and Applications: A Retrospective and Some Thoughts about the Future*.

Figures 5.6-5.8 show the award presentations to winners of the FUSION 2006 best paper competitions.

### **5.3 Technical sessions**

FUSION 2006 featured the following 51 technical sessions. The program was designed to minimize, to the extent possible, conflicts between sessions of similar technical interest. Approximately 40% of these are special sessions.

- Applications I, II
- Artificial Intelligence
- Autonomous Agents for Data and Information Fusion
- Belief Functions: In Memory of Philippe Smets I, II
- Belief Theory I, II
- Biological Applications
- Category Theory and Information Fusion I, II
- Data Association I, II
- Distributed Inference and Decision-Making I, II
- Feature Aided Tracking
- Fusion Theory I, II
- Image Fusion I, II, III
- Image Fusion Assessment I, II
- Intelligent Systems in Data Fusion Engineering
- Issues and Challenges in Resource Management and its Interaction with Level 2/3 Fusion with Applications to Real-World Problems
- Making Histories
- Multistatic Sonar and Radar Tracking I, II, III
- Network-Centric Warfare, Complexity, and Fusion
- Nonlinear Filtering I, II, III
- Ground Target Tracking and Classification I, II
- Higher Level Fusion I, II
- Operations Research I, II
- Radar
- Sensor Management
- Sensor Networks I, II, III
- Situation Management I, II
- Sonar
- Tracing Pedigree in a Distributed Environment
- Tracking I, II
- Video Tracking

### **5.4 Poster session**

Craig Carthel chaired the Wednesday 12 July 2006 poster session in the courtyard of the Convitto della Calza (figure 5.9). There were 14 poster papers at FUSION 2006.





**Figure 5.1** On Thursday 13 July 2006, FUSION 2006 participants gathered in the courtyard of the Convitto della Calza for a group photo.



**Figure 5.2** Georgios Haralabus presented a tutorial on SONAR in the Mistrangelo room.





**Figure 5.3** Stefano Coraluppi greeted FUSION 2006 attendees at the opening plenary session, on Tuesday 11 July 2006. (The flag was on display in recognition of Italy's World Cup win).



**Figure 5.4** Plenary sessions were held in the Pontevecchio auditorium. Marcel Hernandez is shown delivering the first plenary lecture on Tuesday 11 July 2006.



**Figures 5.5** Marina Grossi, CEO of Selex – Sistemi Integrati (a FUSION 2006 financial sponsor), delivered a plenary-session address on 13 July 2006.



**Figure 5.6** Yvo Boers received the Best Paper Award from Craig Carthel.





**Figure 5.7** *Wolfgang Koch received the Best Paper Award from Craig Carthel.*



**Figure 5.8** *Ahmed Pasha received the Best Student Paper Award from Craig Carthel.*



**Figure 5.9** *The poster session took place in the courtyard of the Convitto della Calza on Wednesday 12 July 2006.*

## 6 Social events

In addition to on-site coffee breaks and full-course luncheons at the *Convitto della Calza*, FUSION 2006 featured a number of social events. As with the attendance numbers at the conference, attendance at the social events exceeded the organizing committee's expectations. Thus, in on-site registration, the availability of extra tickets for these events was limited. The nominal capacity for the welcome reception (300) was exceeded with a total of 380 tickets distributed. Similarly, the nominal capacity for the banquet dinner (400) was slightly exceeded with 410 attendees. The guided tours for family members proved popular as well.

### 6.1 Welcome reception

The welcome reception was held at the *Salone dei Cinquecento* (figure 6.1) in *Palazzo Vecchio* (figure 6.2) on 11 July 2006. The evening included welcome speeches by Alberto Baldacci (figure 6.3) and *Assessore* Eugenio Giani (Florence City Council), as well as a piano concert by Richard Klemm, featuring music by Chopin (figure 6.4). The piano concert by Richard Klemm, a scientist at FGAN in Germany, was a good illustration of the Florentine Renaissance spirit of which *Assessore* Giani spoke, in which excellence is pursued in broad and diverse fields. After the piano concert, the organizing committee hosted a welcome cocktail in the *Cortile di Michelozzo* (figure 6.5).

A shuttle service was provided from the *Convitto della Calza* to area hotels, prior to the welcome reception.





**Figure 6.1** *The beautiful Salone dei Cinquecento, once home to the Italian Parliament, provided an extraordinary venue for the welcome reception.*



**Figure 6.2** *Palazzo Vecchio in the centre of Florence was reserved for the FUSION 2006 welcome reception.*



**Figure 6.3** *Alberto Baldacci greeted FUSION 2006 attendees at the start of the welcome reception.*



**Figure 6.4** *Richard Klemm provided an enjoyable and technically impressive concert.*





**Figure 6.5** After the piano concert, a welcome cocktail was hosted by the organizing committee in the Cortile di Michelozzo.

## 6.2 Banquet dinner

*Villa dell'Ombrellino*, a wonderful villa on the hills overlooking Florence, provided the setting for the FUSION 2006 banquet dinner that was held on 12 July 2006 (figures 6.6-6.7). The evening included a cocktail on the villa grounds, featuring music by Marion Ceruti on the *mandolino lombardo* (figure 6.8), a toast by Peter Willett (figure 6.9), and an outdoor full-course dinner with live entertainment (figures 6.10-6.11).

A shuttle service was provided from the *Convitto della Calza* to the banquet dinner, and, after dinner, to area hotels.

## 6.3 Guided tours

FUSION 2006 included a full schedule of guided tours for accompanying family members and friends. This included a full-day tour of Siena and San Gimignano on 11 July, a half-day tour of Florence on 12 July (with the afternoon free to attend the *Uffizi* tour), and a full-day tour of Lucca and Pisa on 13 July. There were approximately 50 participants in the guided tours, and the 50 reserved tickets for the *Uffizi* tour were sold out.





**Figure 6.6** *Appetizers were served in the gardens of Villa dell'Ombrellino, where the participants enjoyed a scenic view of the center of Florence.*



**Figure 6.7** *While dinner was served outside, the Villa was open for attendees throughout the evening.*





**Figure 6.8** *Marion Ceruti provided classical pieces as well as some musical excursions (the Italian Nation Anthem was of particular note) on the mandolino lombardo.*



**Figure 6.9** *Peter Willett greeted everyone before dinner was served.*



**Figure 6.10** *FUSION attendees enjoyed dinner on the grounds of Villa dell'Ombrellino.*





**Figure 6.11** *FUSION 2006 attendees enjoyed light entertainment throughout the evening, and well into the night.*

## 7 Conference budget

The FUSION 2006 conference budget is provided below; it follows the IEEE MS Excel template for IEEE sponsored and co-sponsored conferences. Figures are in EUROS (€). The currency exchange rate used is 1€=1.25US\$, which is the average for the period 1 April – 1 July 2006.

These are *unaudited* figures. The final budget will be provided separately with the transfer of funds to IEEE and ISIF.

Italian state IVA (value added tax) of 20% is to be applied to the conference surplus of approximately €38K. Afterwards, funds will be transferred in equal amount to IEEE and ISIF.

## 7.1 Summary

<b>REVENUE</b>		
6. Registration Fees	€	<u>250861.92</u>
7. Conf. Publicat. Sales		<u>2730.00</u>
8. Exhibits		<u>0.00</u>
9. Social Event		<u>0.00</u>
10. All Other Receipts		<u>35546.00</u>
<b>11. Total Conf. Revenue</b>	<b>€</b>	<b><u>289137.92</u></b>
12. Conference Loans		<u>0.00</u>
<b>13. Total Receipts</b>	<b>€</b>	<b><u>289137.92</u></b>
<b>EXPENSE</b>		
14. Management Services		<u>24000.00</u>
15. Registration Expense		<u>0.00</u>
16. Promotion	€	<u>1730.00</u>
17. Conf. Publicat.		<u>584.10</u>
18. Exhibits/Vendors		<u>0.00</u>
19. Local arrangements		<u>49237.50</u>
20. Social Functions		<u>93485.40</u>
21. Administration		<u>10787.39</u>
22. Committee		<u>14673.86</u>
23. All Other Outlays		<u>45776.00</u>
<b>24. Total Conf Exp.</b>	<b>€</b>	<b><u>240774.25</u></b>
25. Loan Repayments		<u>0.00</u>
<b>26. Total Outlays</b>	<b>€</b>	<b><u>240774.25</u></b>
<b>SURPLUS/(LOSS)</b>		
27. Surplus(Loss)-(Item 13 less Item 26)		<u>48363.67</u>
€		

## 7.2 Revenues

<b>REGISTRATION FEES</b>	<b>Quantity</b>	<b>X FEE</b>	<b>=</b>	<b>Final Report</b>
In Advance- Members	150	650.00	=	97500.00
In Advance-Nonmem.	0	0.00	=	0.00
In Advance-Red. Rate	48	325.00	=	15600.00
At Conference-Member	151	750.00	=	113250.00
At Conf-Nonmember	0	0.00	=	0.00
At Conf-Red. Rate	26	375.00	=	9750.00
Tutorial Fees	144	89.41	=	12875.04
Miniconferences/Symposiums	0	0.00	=	0.00
Other	1	1886.88	=	1886.88
<b>Total</b>				<b>250861.92</b>

	<b>FINAL</b>			
<b>CONF. PUBLICATIONS SALES</b>	<b>Quantity</b>	<b>X FEE</b>	<b>=</b>	<b>Final Report</b>
To IEEE HQ.	263	10.00	=	2630.00
To Members	10	10.00	=	100.00
To Nonmembers	0	0.00	=	0.00
Videotapes & CD-ROM MEMBER	0	0.00	=	0.00
Videotapes & CD-ROM NON MEMBER	0	0.00	=	0.00
Other Publicat. Sales(page chgs)	0	0.00	=	0.00
<b>Total</b>				<b>2730.00</b>

	<b>FINAL</b>			
<b>EXHIBITS</b>	<b>Quantity</b>	<b>X FEE</b>	<b>=</b>	<b>Final Report</b>
Exhibits	0	0.00	=	0.00
<b>Total</b>				<b>0.00</b>

	<b>FINAL</b>	
(Itemize by event on separate sheets.)	<b>Total</b>	<b>0.00</b>

<b>ALL OTHER</b>	<b>FINAL</b>	
IEEE		0.00
Grants		20638.00
Corporate Support		8970.00
Other (Tickets for social events)		5938.00
<b>Total</b>		<b>35546.00</b>
<b>TOTAL REVENUE</b>		<b>289137.92</b>



### 7.3 Expenses

		Final Report
<b>Management/ Services</b>		
Internal Promotion		0.00
Internal General		24000.00
External Promotion		0.00
External General		0.00
	<b>Total</b>	<b>24000.00</b>
<b>Registration Expense</b>		
Registration Expense		0.00
	<b>Total</b>	<b>0.00</b>
<b>PROMOTION</b>		
Announcement		0.00
First Call For Papers		0.00
Call For Papers		750.00
Advance Program		0.00
Final Program		980.00
Advertisements		0.00
Other		0.00
	<b>Total</b>	<b>1730.00</b>
<b>CONFERENCE PUBLICATIONS</b>		
Tech Digest		0.00
Proceedings		584.10
	<b>Total</b>	<b>584.10</b>
<b>EXHIBIT/ Vendor</b> (Attach detailed statement of all expenses necessary to mount and display exhibits)		
Vendor Program		0.00
On-Site Costs		0.00
Other		0.00
	<b>Total</b>	<b>0.00</b>
<b>Local Arrangements</b>		
Audio-Visual		10900.00
Ops. Room Equipment		12060.00
Signage		2400.00
On-site Temps		5105.00
Security		0.00
Convention Center		12992.50
Hotel Meeting Rooms		0.00
Hotel Penalties		0.00
Tours		0.00
Attendee Gifts		2520.00
Transportation		3260.00
Hotel Gratuities		0.00
	<b>Total</b>	<b>49237.50</b>

**SOCIAL FUNCTIONS**

(Itemize events on next page.)

<b>Total</b>	<u>93485.40</u>
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**ADMINISTRATION**

Credit Card Fees	5000.00
Bank Fees	0.00
Audit fees	0.00
Travel Grants & Awards	0.00
Insurance	0.00
Printing/Duplication	727.39
Postage	0.00
Office Supplies	0.00
Web site	2500.00
Tutorial notes	1460.00
Badges	1600.00
Admin Services	0.00
Staff travel	0.00
Other	0.00
<b>Total</b>	<u>11287.39</u>

**COMMITTEE**

OC & TPC Gifts	0.00
OC Attire	0.00
Travel	13243.86
Meetings, Conf Calls	0.00
Other (BOG dinner)	1430.00
<b>Total</b>	<u>14673.86</u>

**Miscellaneous**

VAT	35412.00
Other (ISIF Membership 16Euro)	6080.00
Other Program Expenses	4284.00
<b>Total</b>	<u>45776.00</u>

<b>TOTAL EXPENSES</b>	<u>240774.25</u>
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## 7.4 Social functions

					Final
<b>(1) Breakfast</b>					
No. Breakfast		No. people		€/person	
0	X	0	X	0.00	
0	X	0	X	0.00	
0	X	0	X	0.00	0.00
<b>(2) Luncheons</b>					
No. Luncheons		No. people		€/person	
3	X	300	X	20.00	
3	X	370	X	28.00	
3	X	370	X	28.00	31080.00
<b>(3) Welcome Reception</b>					
No. Reception		No. people		€/person	
1	X	240	X	25.00	
1	X	360	X	22.00	
1	X	360	X	22.00	7920.00
<b>(4) Dinner</b>					
No. Dinner		No. people		€/person	
1	X	240	X	70.00	
1	X	410	X	70.00	
1	X	410	X	70.00	28700.00
<b>(5) Breaks</b>					
No. Breaks		No. people		€/person	
6	X	300	X	4.00	
6	X	370	X	6.50	
6	X	350	X	6.50	13650.00
<b>(6) Other F &amp; B activities</b>					12135.40
<b>Total Social Function Expenses</b>					<b>93485.40</b>

	<b>Final</b>		<b>Final</b>
Program Production	0.00	Paper Review	0.00
Special Speakers Fee	4284.00	Special Speakers Travel	0.00
Program Speaker Fees	0.00	Program Speaker Travel	0.00

## 8 Summary and recommendations

FUSION 2006 was a success: a record number of submissions, a record number of high-quality accepted papers, record attendance levels, a technically and culturally event-packed week, and a healthy profit for ISIF and the IEEE. Except for a single formal complaint, the organizing committee did not receive any negative criticism of note throughout the lengthy conference preparation phase, the week of the conference itself, and the post-conference wrap-up activities. This is impressive considering the countless policy, logistical, scientific, programmatic, and financial decisions that were taken over a two-year period.

In hindsight, there are a few points where the organizing committee would do things differently. These are listed below as they may help in future FUSION conference organizing efforts:

- In planning future tutorial programs, it would be helpful not only to have attendance numbers, but feedback on the quality of the tutorial. This is easily accomplished by including a short tutorials feedback form in the registration packet.
- The poster session should have been longer: thirty minutes combined with an afternoon coffee break was insufficient for adequate exposure to be given to poster papers.
- The complexity associated with the need to prepare adequate supporting VISA documentation for a number of foreign attendees requires up-front planning, considerable attention, and possibly some legal expertise. The problem is exacerbated when the documentation must originate from a host-nation national, who is not affiliated with a government or defense organization. For FUSION 2006, Stefano Marano did an excellent job in stepping in to manage the situation.

A number of aspects of the FUSION 2006 planning effort were quite successful. A few of these items are highlighted below:

- The main ingredient for a successful effort is a small, close-knit, pro-active organizing team. This was in place for FUSION 2006!
- The compromise that was struck in handling past FUSION special-session controversies proved quite effective: include special-session organizers as reviewers on papers in their session, include other reviewers as well, and engage the special-session organizers in the acceptance process while still maintaining full authority on the final decision.
- Full control of an in-house scientific secretariat for paper submissions, reviews, and final uploads is essential in maintaining strict control of the conference timelines (particularly in managing a large TPC), as well strict control of the quality of the final conference proceedings.

Additional advice to future FUSION conference organizers is given below.

- *Use a professional organization.* The use of a professional organizing company is strongly recommended. Although it can be expensive (€28800 including VAT for FUSION 2006), it is definitely worth it for the success of the conference. The FUSION 2006 organizing committee hired DGMP, a local company with a long experience in the organization of conferences of various sizes; DGMP was the interface between the FUSION 2006 organizing committee and all the service providers. DGMP solved problems big and small, and took care of many logistical aspects like:
  - The registration process, including on-line payment by credit card;
  - The [www.fusion2006.org](http://www.fusion2006.org) website;

- The layout and printing of the call for papers, the program, and posters;
  - Hotel reservations and payments;
  - Organization of social events (welcome reception, banquet dinner, banquet dinner shows, and guided tours);
  - Dealing with the conference venue;
  - Providing the support staff during the conference.
- *Use conservative attendance estimates.* It is good to prepare an estimated budget with a breakeven point with a small number of participants, e.g. 200-240. While this means having slightly higher registration fees, it guarantees having limited budget concerns. As the conference approaches, there tend to be a number of unexpected expenses. Higher registration fees do not prevent people from registering! The FUSION 2006 organizing committee discussed at length the issue of registration fees; in the end, it was agreed to have relatively high rates to guarantee a safe budget while allowing for an increase in the number of services available during the conference, and guaranteeing a nice income for ISIF and IEEE.
  - *Consider IEEE co-sponsorship.* Advantages include:
    - Use of the IEEE logo;
    - Use of IEEE instruments to advertise the conference (e.g. IEEE conference listings on the IEEE website and on the AESS magazine);
    - Proceedings available through IEEEExplore;
    - Access to IEEE mailing lists to advertise the conference;
    - With copyright transfer to IEEE, a contribution of 25USD per paper; with shared copyright between IEEE and ISIF, a contribution of 12.5USD per paper;
    - Financial backing in case of budget losses;
    - Opportunity for a financial loan.

Disadvantages include:

- Sharing of profits with IEEE;
- Reporting to IEEE, particularly on the budget.

Finally, the organizing committee wishes to provide some recommendations to the ISIF BoD in its oversight of conference activities:

- Provide conference organizers with a short document listing ISIF conference policies. This would provide some year-to-year consistency in conference standards.
- Consider the introduction of a permanent conference website and scientific secretariat. This would reduce the organizational burden on future conference organizers, and avoid the *reinvent-the-wheel* syndrome.
- Adopt the IEEE paper format (MS Word and LaTeX) as a standard. This guarantees compatibility with IEEEExplore. Many paper submitters used this format anyway, and never switched to the ISIF template.
- Most importantly, provide a longer timeline (ideally, two years) from the date of conference proposal acceptance to the scheduled conference date. Fifteen months is insufficient.



## 9 Acknowledgements

The FUSION 2006 organizing committee expresses its sincere gratitude to the following persons and organizations who have contributed to the success of FUSION 2006:

- ISIF, IEEE, IEEE AESS, and NURC for technical sponsorship;
- ONR, ONRG, BAE AIT, EOARD, Selex, Finmeccanica, and TNO for financial sponsorship;
- Members of the technical program committee, awards committee, additional reviewers, special session organizers, and session chairs;
- Invited plenary session speakers: Alfonso Farina, Steven Ramberg, Marcel Hernandez, Roy Streit, Sten Andler, Pierre Valin, Alexander Jouan, Marina Grossi, Nils Sandell, and Yaakov Bar-Shalom;
- Graciela Stiavetti and the DGMP staff, as well as the staff at the *Convitto della Calza*;
- The town of Florence and particularly *Assessore* Eugenio Giani for hospitality throughout the week, most notably during the welcome reception at *Palazzo Vecchio*;
- Drs. Richard Klemm and Marion Ceruti for the *pianoforte* and *mandolino lombardo* musical concerts;
- NURC management, particularly Director Steven Ramberg and Deputy Director Douglas Todoroff, for their enthusiastic support and for allowing considerable scientific staff resources to be allocated to FUSION 2006 activities;
- NURC library services staff for producing the FUSION 2006 CD-ROM proceedings in a timely and efficient manner, at no cost to the conference.

The organizing committee worked hard over the past two years to host a memorable conference. We think we succeeded in this, and we are grateful to all who participated and shared in FUSION 2006.

# Document Data Sheet

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<b>Title</b> The Ninth International Conference On Information Fusion (Fusion 2006) Final Conference Report		
<b>Abstract</b> <p>The 9<sup>th</sup> International Conference on Information Fusion (FUSION 2006) was held on 10-13 July 2006 in Florence, Italy. The FUSION conference series serves as the annual gathering and is the flagship event of the International Society of Information Fusion. The International Society of Information Fusion is an independent, non-profit organization dedicated to advancing the knowledge, theory and applications of information fusion. Through its website, conferences, publications and member services, it is its goal to encourage the exchange of information among information fusion professionals worldwide.</p> <p>This document is the final conference report that, along with the transfer of conference funds to ISIF and IEEE, represents the main deliverable from the FUSION 2006 organizing committee. It includes an overview of the conference planning process, a discussion of key policy decisions, a complete listing of the conference program, committee members, special session organizers, session chairs, and conference attendees, a description of the related social events, the final budget, lessons learned, and recommendations to the ISIF Board of Directors.</p> <p>NURC provided high-visibility contributions to FUSION 2006: the General Co-chair, Technical Chair, Local Arrangements and Finance Chair, several members of the Technical Program Committee, numerous paper contributions, financial sponsorship, and publication of the CD-ROM proceeding.</p>		
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<b>Issuing Organization</b> NATO Undersea Research Centre Viale San Bartolomeo 400, 19126 La Spezia, Italy  <i>[From N. America:          NATO Undersea Research Centre          (New York) APO AE 09613-5000]</i>		Tel: +39 0187 527 361 Fax: +39 0187 527 700  E-mail: <a href="mailto:library@nurc.nato.int">library@nurc.nato.int</a>