



# PROGRAMME



## ECCE-11

**Eleventh European Conference  
on Cognitive Ergonomics**

**Cognition, Culture and Design**

**September 8-11, 2002  
Catania, Italy**

<http://www.ecce.info/>

## SAFECOMP 2002

**The 21st International Conference  
on  
Computer Safety,  
Reliability and Security**

**September 10-13, 2002  
Catania, Italy**

<http://www.safecomp.org/>



## **ECCE-11**

The ECCE-11 conference is organised by EACE. The ECCE series of conferences has been organised biannually since 1982, thereby making it the oldest conference series of its kind internationally. ECCE brings together researchers in the domain of cognitive ergonomics, which aims at combining cognitive engineering and technical information processing system developments together to improve the design of joint interactive systems.

The main theme of ECCE-11 is Cognition, Culture and Design. ECCE-11 focuses on the practical issues of human interaction with technology in the context of work and in particular how human cognition affects, and is affected by work and working conditions. Human work has irreversibly become work with technology and the nature of work has changed to make the role of human cognition more important. Modern society has come to depend on the safe and efficient functioning of a multitude of technological systems in areas as diverse as industrial production, transportation, communication, supply of energy, information, and materials, health and finance.

## **SAFECOMP 2002**

SAFECOMP is an annual event covering the state of the art, experience and new trends in the areas of computer safety, reliability and security regarding dependable applications of computer systems. EWICS TC7 established SAFECOMP in 1979.

SAFECOMP provides ample opportunity to exchange insights and experience on emerging methods and practical applications across the borders of the disciplines represented by participants. SAFECOMP focuses on safety-critical computer applications and is a platform for knowledge and technology transfer between academia, industry and research institutions. SAFECOMP 2002 papers cover all aspects of dependability and survivability of critical computer-based systems of systems and infrastructures. Due to the increasing integration and evolution of hybrid systems, SAFECOMP emphasises work in relation to human factors, system evolution, dependability and survivability. Nowadays practical experience points out the need of multidisciplinary approaches to deal with the nature of critical complex settings. SAFECOMP emphasises multidisciplinary work enhancing our understanding across disciplines.

## Programme at a Glance

	Sun 08-Sep-2002	Mon 09-Sep-2002	Tue 10-Sep-2002	Wed 11-Sep-2002	Thu 12-Sep-2002	Fri 13-Sep-2002
09:00-10:30		ECCE	ECCE	ECCE & SAFECOMP	SAFECOMP	SAFECOMP
10:30-11:00	<i>Coffee Break</i>					
11:00-12:30		ECCE	ECCE	ECCE & SAFECOMP	SAFECOMP	SAFECOMP
12:30-14:00	<i>Lunch</i>					
14:00-15:30		ECCE	ECCE	ECCE	SAFECOMP	SAFECOMP
15:30-16:00	<i>Coffee Break</i>					
16:00-18:00	ECCE	ECCE	ECCE	ECCE	SAFECOMP	SAFECOMP
18:00-...	ECCE Welcome Reception	ECCE Social Dinner	SAFECOMP Welcome Reception		SAFECOMP Social Dinner	

## Sunday, 08 September

- 16:00 **ECCE-11 and SAFECOMP 2002 Registration Desk  
Opening at Sheraton Hotel**
- 16:30-18:30 **Panel Session: Self-confrontation, simulation, and mirrors  
as tools for research and design of work**  
P. Béguin, Y. Engeström
- Working, learning and designing through simulation**  
P. Béguin, P. Pastré
- Crossed self-confrontation in the “clinic of activity”**  
Y. Clot, G. Fernandez, and L. Carles
- The uses of “mirrors” in the change laboratory:  
Facilitating expansive learning at work**  
Y. Engeström
- 19:00 **ECCE-11 Welcome Reception at Sheraton Hotel**

## Monday, 09 September

- 09:00-10:30 **Session 1 - Design of Cooperative Work (I)**  
Chair: P. Wright
- Interaction through clusters of artifacts**  
O. Bertelsen, S. Bødker
- Innovate or preserve: When technology questions  
co-operative processes**  
P. Marti, P. Lanzi
- Expertise in distributed co-operation: A command  
post in operational management**  
P. Antolin-Glenn, J. Rogalski
- 10:30-11:00 Coffee break
- 11:00-12:30 **Session 2 - Design of Cooperative Work (II)**  
Chair: S. Bødker
- Socio-technical systems analysis:  
Which approach should be followed?**  
D. Nathanael, N. Marmaras, V. Papantoniou, and N. Zarboutis

**Organisational robustness: A question of collective reflection on practice within the workplace**

E. Morvan, G. de Terssac, G. Pons, and S. Figarol

**The evolution of possibility: From organizational silos to global knowledge networks**

G.A. Sundström, C.C. Deacon

12:30-14:00 Lunch

**Session 3 - Visual Presentations (I)**

Chair: A. Pasquini

**Session 4 - Methods and Design Process (I)**

Chair: G. van der Veer

**Solving class design problems: Towards developing engineering design principles**

S. Cummaford, J. Long

**Creative design in safety critical systems:  
A methodological proposal**

P. Marti, C. Moderini

16:00-16:30 Coffee break

**Session 5 - Reality of Interaction (I)**

Chair: E. Hollnagel

**The effect of car drivers' attitudes and national cultures on design of an anti-collision system**

P.C. Cacciabue, M. Martinetto, and A. Re

**The temporal dimension of dynamic function allocation**

M. Hildebrandt, M. Harrison

**From dynamic task allocation to function delegation in air traffic control**

J. Hoc, S. Debernard

18:00-18:45 **Discussion**

20:00 **ECCE-11 Social Dinner at “Sicilia in Bocca”**

# Tuesday, 10 September

09-00-10:30

## **Session 6 - Interaction Design (I)**

Chair: L. Bannon

### **The “Squidgy”: An order-of-magnitude display**

M.V. Howard, David D. Woods

### **Beyond bars: A comparative study of window navigation techniques**

V. Kaptelinin

### **Gaze relevance metrics for safe and effective operations of high-speed train: Application to analysing train drivers' learning with new train interface**

K. Itoh, M. Arimoto, and Y. Akachi

10:30-11:00

Coffee break

11:00-12:30

## **Session 7 - Meaning and Context (I)**

Chair: A. Rizzo

### **Use of teleconferencing: Perturbing cognitive and social comfort?**

B. Cahour, F. Lorant, and F. Sanchiz

### **Designing interactive museum exhibits: Enhancing visitor curiosity through augmented artefacts**

L. Ciolfi, L. Bannon

### **Older adults' comprehension of speech as interactive domestic alarm system output**

L. Lines, K. Hone

12:30-14:00

Lunch

14:00-15:00

## **Session 8 - Visual Presentations (II)**

Chair: P.C. Cacciabue

15:00-16:00

## **Session 9 - Reality of Interaction (II)**

Chair: C. Warren

### **Cognitive flexibility and adaptability to environmental changes in dynamic complex tasks**

J. Cañas, A. Antolí, I. Fajardo, and L. Salmeron

**An activity based analysis of information characteristic of monitors and their use in anaesthetic practice**

K. Ulla-Majja, L. Norros

16:00-16:30 Coffee break

**Session 10 - MEANING AND CONTEXT (II)**

Chair: V. Kaptelinin

**From information processing to the dialogical meaning making: Another direction for cognitive ergonomics**

J. C. McCarthy, P. Wright, and M. Cooke

**Cultural issues of nuclear power plant collective control in accidental situations and their impact upon design issues**

J. Theureau, G. Filippi, G. Saliou, and P. Vermersch

**Impact of culture and history on the future performance of operators**

C. Brassac, V. Grosjean

18:00-18:45 Discussion

Each session on **Visual Presentations** includes the following contributions:

**The computer as medium for expression of geographical information: Drawbacks and challenges**

M.C.C. Baranauskas, J. Schimiguel, and A.B. Prado

**Procedural interfaces: Computer-supported task execution**

G.A. Boy

**Teaching and learning in the VLCC: Actions, reactions and emerging practice in a very large computing centre**

K. Buckner, E. Davenport

**Mediated knowledge on the web: The role of cognitive mediators in design**

L. Calvi, L. Magnani

**A model of cultural influences on teamwork practice:**

**A design team case-study**

C. Chisalita, G. van der Veer, J.F. Hoorn, and M.C. Puerta Melguizo

**Experiential implications of technology: A dialogical perspective on artefact meaning**

M. Cooke, J.C. McCarthy

**Assessing the “naturalness” of object-oriented design - Expertise and the comprehension of object-oriented programs**

S.P. Davies

**Cognitive ergonomics oriented design of safety related control software**

W.A. Halang, F. Saglietti

**Probing the probes: Domestic probes and the design process**

T. Hemmings, A. Crabtree, T. Rodden, K. Clarke, and M. Rouncefield

**Using dynamical illustrations and aural explanations in web sites: An application to a search engine's syntax**

C. Hidrio, E. Jamet, and O. Le Bohec

**Modelling the audience of a web-based presentation: Context-driven, rhetorical role-playing approach**

S.G. Loeber

**Helping users through ubiquitous, personalised, interactive support in a sightseeing visit**

L. Marucci, F. Paternò

**SKATS: Reducing patient risk in surgical training**

L. Moody, J. Arthur

**Semiotics and interaction analysis**

S. O'Neill, D.R. Benyon, and S. Turner

**User centered design in web consultancy**

M. Palmonari, L.F. Petroni

**Designing online services to support the cultural industries**

B. Steele, C. Roast

**Capability thresholds to assist in user interface design for the elderly**

K. Walsh, T. Waldmann

**Emergency management respecting system's complexity:**

**The case of fire in a metro railway system**

N. Zarboutis, N. Marmaras



- 09:00-18:00     **SAFECOMP 2002 Tutorials**
- 09:00-18:00     **Tutorial 1**  
**Safety Case Management**  
Tim Kelly (University of York, UK)
- 09:00-12:30     **Tutorial 2**  
**Methods for Dependability Analyses  
of Software Intensive Systems**  
Gerald Sonneck (ARCS, A)
- 14:00-18:00     **Tutorial 3**  
**Critical Systems Development with UML**  
Jan Jürjens (Munich University of Technology, D)
- 19:00             **SAFECOMP 2002 Welcome Reception at Sheraton Hotel**

## **Wednesday, 11 September**

- 09:00 - 09:30     **ECCE-11 & SAFECOMP 2002 Joint Session**  
**“Human-Computer System Dependability”**
- ECCE-11 & SAFECOMP 2002 Welcome**  
Sandro Bologna(ENEA, I)  
Erik Holtnagel (University of Linköping, S)
- Session Rationale: Human-Computer System Dependability**  
Sandro Bologna (ENEA, I)  
Erik Holtnagel (University of Linköping, S)
- Dependability of Joint Human-Computer System**  
Erik Holtnagel (University of Linköping, S)
- 09:30 - 10:00     **Panel 1: Position Statements**  
Moderators:  
Sandro Bologna (ENEA, I)  
Erik Holtnagel (University of Linköping, S)  
Panelists:  
Christopher Barlett (BAE SYSTEMS Avionics Ltd, UK)  
Helmut Bezechny (DOW Deutschland, D)  
Bjørn Axel Gran (Institutt for Energiteknikk, NO)

10:00 - 10:30 Discussion

10:30 - 11:00 Coffee Break

11:00 - 11:30 **Panel 2: Position Statements**  
 Moderators:  
 Sandro Bologna (ENEA, I)  
 Panelists:  
 Erik Hollnagel (University of Linköping, S)  
 Dino De Luca (NOKIA ITALIA S.p.A., I)  
 Bernard Pavard (IRIT - Université Paul Sabatier, F)  
 Job Rutgers (Philips Design, NL)

11:30 - 12:00 Discussion

12:00 - 12:30 **Keynote Talk**  
**Dependability in the information society:**  
**Getting ready for the FP6**  
 Andrea Servida (European Commission)

12:30-14:00 Lunch

14:00-15:30 **Session 11 - Interaction Design (II)**

Chair: S. Bagnara

**The design and evaluation of intelligent access  
to mankind's collective memory**

G. de Haan

**Do you see what I see?**

**A user-centred approach to image retrieval**

P. Briggs, B. Burford, J. Eakins, L. Conniss, and M. Graham

**Cultural values in web site design**

C. Dormann, C. Chisalita

15:30-16:00 Coffee break

16:00-17:00 **Session 12 - Methods and Design Process (II)**

Chair: V. Grosjean

**Semiotics and interaction analysis**

S. O'Neill, D.R. Benyon, and S. Turner

**Design for new cultures of use of use:  
Scenario as a method to bridge the gap**

C. Chisalita, M.C. Puerta Melguizo, and G. C. van der Veer

17:00-18:30 **EACE meeting**

14:00 - 14:30 **Opening Session**

**SAFECOMP 2002 Welcome & Opening**

Sandro Bologna (ENEA, I)

**EWICS TC7 Welcome**

Udo Voges (Forschungszentrum Karlsruhe, D)

**SAFECOMP 2002 Presentation of the Technical Programme**

Stuart Anderson, Massimo Felici (University of Edinburgh, UK)

14:30 - 15:30 **Session 1: Human Factors**

Chair: Floor Koornneef (TU Delft, NL)

**A rigorous view of mode confusion**

Jan Bredereke, Axel Lankenau (Universität Bremen, D)

**Dependability as ordinary action**

Alexander Voß, Roger Slack, Rob Procter, Robin Williams,  
Mark Hartswood (University of Edinburgh, UK), and  
Mark Rouncefield (University of Lancaster, UK)

15:30 - 16:00 Coffee Break

16:00 - 17:30 **Session 2: Security**

Chair: Peter Daniel (Marconi Secure Systems, UK)

**Practical solutions to key recovery based  
on PKI in IP security**

Yoon-Jung Rhee (Korea University, KR), Kwang-Moon Cho  
(Cheonan University, KR), and Tai-Yun Kim (Korea University, KR)

**Redundant data acquisition in a distributed  
security compound**

Thomas Droste (Ruhr-University Bochum, D)

**Survivability strategy for a security critical process**

Ferdinand J. Dafelmair (TÜV Süddeutschland, D)

17:30 - 18:00 **Poster Session 1: Dependability Assessment**

Chair: Stefan Wittmann (BSI, D)

**Statistical comparison of two sum-of-disjoint-product algorithms for reliability and safety evaluation**

Klaus Heidtmann (Hamburg University, D)

**Safety and security analysis of object-oriented models**

K. Lano, D. Clark, and K. Androutsopoulos

(King's College London, UK)

**The CORAS framework for a model-based risk management process**

Rune Fredriksen, Monika Kristiansen, Bjørn-Axel Gran

(Institute for Energy Technology, NO), Ketil Stølen (Sintef

Telecom and Informatics, NO), Tom Arthur Opperud (Telenor

Communications, NO), and Theo Dimitrakos (CLRC RAL, UK)

## Thursday, 12 September

09:00 - 10:00 **Keynote Speaker**

**Software challenges in aviation systems**

John C. Knight (University of Virginia, US)

10:00 - 10:30 **Poster Session 2: Application of Formal Methods**

Chair: Stefan Wittmann (BSI, D)

**A strategy for improving the efficiency of procedure verification**

Wenhui Zhang (Chinese Academy of Sciences, CN)

**Verification of the SSL/TLS protocol using a model checkable logic of belief and time**

M. Benerecetti (University of Naples, I), L. Spalazzi,

and S. Tacconi (University of Ancona, I)

10:30 - 11:00 Coffee Break

11:00 - 12:30 **Session 3: Reliability Assessment**

Chair: Udo Voges (Forschungszentrum Karlsruhe, D)

**Reliability assessment of legacy safety-critical systems upgraded with off-the-shelf components**

Peter Popov (City University, UK)

### **Assessment of the benefit of redundant systems**

Luping Chen, John May, and Gordon Hughes  
(University of Bristol, UK)

### **Estimating residual faults from code coverage**

Peter G. Bishop (Adelard and City University, UK)

12:30 - 14:00 Lunch

### **Session 4: Design for Dependability**

Chair: Alberto Pasquini (ENEA and DeepBlue, I)

### **Towards a metrics based verification and validation maturity model**

Jef Jacobs (Philips Semiconductors, NL), Jos Trienekens  
(Eindhoven University of Technology, NL)

### **Analysing the safety of a software development process**

Stephen Paynter (MBDA Ltd., UK)

### **Software criticality analysis of COTS/SOUP**

Peter Bishop, Robin Bloomfield (Adelard and City University, UK),  
Tim Clement, and Sofia Guerra (Adelard, UK)

15:30 - 16:00 Coffee Break

### **Session 5: Safety Assessment**

Chair: Gerd Rabe (TÜV Nord, D)

### **Methods of increasing modelling power for safety analysis, applied to a turbine digital control system**

A. Bobbio (Università del Piemonte Orientale, I),  
E. Ciancamerla (ENEA, I), G. Franceshini (Università di  
Torino, I), M. Minichino (ENEA, I), and L. Portinale  
(Università del Piemonte Orientale, I)

### **Checking safe trajectories of aircraft using hybrid automata**

Ítalo Romani de Oliveira, Paulo Sérgio Cugnasca  
(Escola Politécnica da Universidade de São Paulo, BR)

### **Model-based on-line monitoring using a state sensitive fault propagation model**

Yiannis Papadopoulos (University of Hull, UK)

## Friday, 13 September

09:00-10:00

### Keynote Speaker

#### **On diversity, and the elusiveness of independence**

Bev Littlewood (City University, UK)

10:00-10:30

### Poster Session 3: Design for Dependability

Chair: Massimo Felici, (The University of Edinburgh, UK)

#### **On the design of a firewall for academic centers based on a new security policy**

MahdiReza Mohajerani, Ali Moeini (University of Tehran, IR)

#### **A watchdog processor architecture with minimal performance overhead**

Francisco Rodríguez, José Carlos Campelo, and Juan José Serrano (Universidad Politécnica de Valencia, E)

10:30-11:00

Coffee Break

11:00-12:30

### Session 6: Application of Formal Methods

Chair: Robin Bloomfield (Adelard and City University, UK)

#### **Model-checking based on fluid petri nets for the temperature control system of the ICARO co-generative plant**

M. Gribaudo (Università di Torino, I), A. Horváth (University of Technology and Economics, HU), A. Bobbio (Università del Piemonte Orientale, I), E. Tronci (Università di Roma "La Sapienza", I), E. Ciancamerla, and M. Minichino (ENEA, I)

#### **Assertion checking environment (ACE) for formal verification of C programs**

Babita Sharma, S.D. Dhodapkar (Bhabha Atomic Research Centre, IN), and S. Ramesh (Centre for Forma Design and Verification of Software, IN)

#### **Safety Analysis of the Height Control System for the Elbtunnel**

Frank Ortmeier, Gerhard Schellhorn, Andreas Thums, Wolfgang Reif (Universität Augsburg, D), Bernhard Hering, and Helmut Trappschuh (Siemens, D)

12:30-14:00 Lunch

14:00-15:30 **Session 7: Design for Dependability**

Chair: Stuart Anderson (The University of Edinburgh, UK)

**Dependability and configurability: Partners or competitors in pervasive computing?**

Titos Saridakis (NOKIA Research Center, FIN)

**Architectural considerations in the certification of modular systems**

Iain Bate, Tim Kelly (University of York, UK)

**A problem-oriented approach to common criteria certification**

Thomas Rottke, Denis Hatebur (TÜVIT GmbH, D),  
Maritta Heisel (Technische Universität Ilmenau, D),  
and Monika Heiner (Brandenburgische Technische  
Universität Cottbus, D)

15:30-16:00 **Closing Session**

**SAFECOMP 2002 Review**

Sandro Bologna (ENEA, I), Stuart Anderson, and  
Massimo Felici (The University of Edinburgh, UK)

**Presentation of SAFECOMP 2003**

Stuart Anderson, Massimo Felici  
(The University of Edinburgh, UK)

## **EWICS TC7**

### **European Workshop on Industrial Computer Systems: Reliability, Safety and Security 9-10 September 2002**

The mission of EWICS is:

"To promote the economical and efficient realisation of programmable industrial systems through education, information exchange, and the elaboration of standards and guidelines"

EWICS is active in the field of Programmable Electronic Systems reliability, safety and security. It has members from most European countries, covering various fields of interests and affiliations, as well as from the USA. To achieve the above goals we

- assess the state of the art in methods and tools for critical software development and maintenance in industrial environments
- develop standards and guidelines for the development and assessment of safe and secure systems
- disseminate information and knowledge in this field
- exchange technical knowledge between members.

To receive further information about the EWICS TC7 meetings please visit the EWICS TC7 web site

<http://www.ewics.org/>

or contact the EWICS TC7 Chair:

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## The City Host

Catania is situated at the centre of the Ionian coast in eastern Sicily and extends from the sea to the low foothills of Etna, Europe's highest active volcano. Historically Catania has been the gateway to many cultures, which are represented by different architectural styles (e.g., baroque) and monuments (e.g., the Greek-Roman Theatre). Due to its geographical position and history Catania represents a Mediterranean gate to Europe. Catania is the meeting point of the vast human and economic area of the Mediterranean, not just a confluence of economic interests but convergence and confrontation of cultures and civilisations. In recent years industry has created new areas dedicated to productive activity. The establishment of hi-tech multinationals has given the name of "Etna Valley" to the industrial area. The modern Catania has become well-known for its technological revolution. Sicily a land of great beauty but also a productive land with industrial districts, comprising SMEs with strong export potential and of a growing desire for internationalisation.