

# XIX EURO SUMMER INSTITUTE

## Decision Analysis and Artificial Intelligence

Toulouse, France, 9-21/9/2001.

### FINAL REPORT

#### Summary

This is the final report of the XIX EURO Summer Institute which took place in Toulouse, France, 9 to 21 September 2001 on the subject of “Decision Analysis and Artificial Intelligence”. The XIX ESI has been sponsored by the French OR society (ROADEF) and EURO with the active support of EURO itself, Université Paris Dauphine (LAMSADE), Université Paris 6 (LIP6) and Université Paul Sabatier de Toulouse (IRIT).

The subject has been identified as an emerging issue both for the Decision Analysis and the Artificial Intelligence communities. There is evidence both in literature and in current practice that concepts, methods and tools developed within the two disciplines are merging and if they are not commonly explored.

From the call for papers we quote: *“In recent years more and more researchers in the field of decision analysis and artificial intelligence realised they work on common, parallel or similar subjects. Issues such as: planning under uncertainty, qualitative models of decision making, distributed decision making, automated decision making, preference modelling, ordinal structures, rational and autonomous agents, learning, are now in the centre of both theoretical and applied research of both disciplines. The ESI XIX welcomes contributions from both areas on these subjects”*.

This report is organised in the following sessions:

- organisation;
- before the ESI;
- the ESI itself;
- feedback and conclusion.

A finance report can be found in Annex A.

## Organisation

The ESI has been governed by two structures: the organisation committee in charge of the logistics and the running of the ESI and the scientific committee aimed to help in controlling the submissions (when necessary) and in providing the tutorials during the ESI itself. The two bodies were:

### Organising Committee

- Hélène Fargier, IRIT - CNRS, Université Paul Sabatier, Toulouse, France.
- Jérôme Lang, IRIT - CNRS, Université Paul Sabatier, Toulouse, France.
- Daniel Lehmann, Hebrew University of Jerusalem, Israel.
- Patrice Perny, LIP6, Université Paris 6, Paris, France.
- Alexis Tsoukiàs, LAMSADE - CNRS, Université Paris Dauphine, Paris, France.
- Philippe Vincke, SMG-ISRO, Université Libre de Bruxelles, Bruxelles, Belgium.

### Scientific Committee

- Denis Bouyssou, LAMSADE - CNRS, Université Paris-Dauphine, France.
- Didier Dubois, IRIT - CNRS, Université Paul Sabatier, Toulouse, France.
- Jean-Yves Jaffray, LIP6, Université Paris 6, Paris, France.
- Malik Ghallab, LAAS, Toulouse, France.
- Hector Geffner, Universidad Simon Bolivar, Caracas, Venezuela.
- Jérôme Lang, IRIT - CNRS, Université Paul Sabatier, Toulouse, France.
- Daniel Lehmann, Hebrew University of Jerusalem, Israel.
- Patrice Perny, LIP6, Université Paris 6, Paris, France.
- Jean-Charles Pomerol, LIP6, Université Paris 6, Paris, France.
- Henri Prade, IRIT - CNRS, Université Paul Sabatier, Toulouse, France.
- Roman Słowiński, Poznan University of Technology, Poland.
- Alexis Tsoukiàs, LAMSADE - CNRS, Université Paris Dauphine, Paris, France.
- Philippe Vincke, SMG-ISRO, Université Libre de Bruxelles, Belgium.

The chairmen of the ESI were Patrice Perny and Alexis Tsoukiàs.

## Before the ESI

The project of this ESI was first discussed during a meeting of a CNRS special interest group. The application has been introduced at EURO in January 2000 with the sponsorship of ROADEF. The first call for papers, together with the establishment of the ESI XIX web page (see <http://www-poleia.lip6.fr/perny/ESI2001/>) has been diffused in early autumn 2000 (end of September), mainly to the EURO societies, but also to a number of mailing lists where interested people could get aware of the initiative.

A second mailing has been done in early March 2001 in order to recall to the EURO societies and the interested people about the ESI. Only e-mail has been used in order to diffuse the call for papers.

By the end of March we have received the list of the IFORS candidates (12) of which finally one has been selected (Satish Seghal). 15 other regular submissions reached as within the schedule asked in the call for papers. In delay we received the demand of two french and one belgian asking to participate although not having submitted a paper to the national OR society. All of them were able to present an original paper and all of them fit perfectly the ESI subject. The scientific committee being sure that there was no opposition of the two societies, considering that there was still place for participants and appreciating the quality of the submissions decided to admit them at the ESI. These extra participants were Kim Cao Van (from Belgium), Celine Lafage and Sebastien Konieczny (from France).

The final programme has been diffused at the beginning of July as soon as the exact schedule of the tutorials was fixed. During August one ESI participant (Pierluigi Santin, from Italy) wrote us announcing that he was moving to a new job and had to give up his participation to the ESI. The total number of participants was therefore 18 from 12 different countries (Belgium, Byelorussia, France, Germany, Greece, Hungary, India, Italy, Poland, Portugal, Spain, The Netherlands).

## The ESI itself

The ESI took place within the building of IRIT (the computer science department of the University of Toulouse, Paul Sabatier) located at the University campus, in the conference room, fully equipped for such scientific events. The final programme was as follows:

- SUNDAY 9/9/2001: 17h00 - 21h00: Welcome of participants at the “Cit Universitaire de l’Arsenal”

- MONDAY 10/9/2001
  - 9h00 - 10h00: Presentation of the ESI and of the participants
  - 10h00 - 10h30: Coffee Break
  - 10h30 - 12h30: Lecture 1, Philippe VINCKE (Université Libre de Bruxelles, Belgium), “Preference Modelling and Multicriteria Decision Making”
  - 12h30 - 14h30: Lunch
  - 14h30 - 15h30: Maria Mavri (Greece), “Performance-Net: A Decision Support System for evaluating and reconfiguring a bank’s branch network”
  - 15h30 - 16h30: Satish Sehgal (India-IFORS), “Application of Fuzzy Table Look-up Method to Credit Rating”
  - 16h30 - 17h00: Coffee Break
  - 17h00 - 18h00: Vyacheslav Pokhilko (Byelorussia), “O regularization of the multicriteria optimization problem on permutations”
  
- TUESDAY 11/9/2001
  - 8h45 - 10h45: Lecture 2, Didier Dubois (CNRS, Toulouse III University, France), “Possibility Theory: applications to decision analysis”
  - 10h45 - 11h15: Coffee Break
  - 11h15 - 12h15: Kim Cao Van (Belgium), “A consistent representation of rankings: transforming reversed preference into doubt”
  - 12h15 - 14h30: Lunch
  - 14h30 - 15h30: Tiago Simas (Portugal), “Number recognition using a fuzzy decision method”
  - 15h30 - 16h30: Bernard de Baets (Belgium), “Transitivity-preserving fuzzification schemes for cardinality-based similarity measures”
  - 16h30 - 17h00: Coffee Break
  - 17h00 - 18h00: Juan Antonio Fernandez (Spain), “Knowledge Synthesis Optimising the Combinatorial Storage of Multidimensional Matrices”
  
- WEDNESDAY 12/9/2001
  - 8h45 - 10h45: Lecture 3, Denis Bouyssou (CNRS, Paris Université Paris Dauphine, France), “An introduction to Social Choice Theory”
  - 10h45 - 11h15: Coffee Break
  - 11h15 - 12h15: Céline Lafage (France), “Logical Approaches for Preference Representation”

- 12h15 - 14h00: Lunch
- 14h00 - 15h00: Sándor Zoltán Németh (Hungary), “Stability Analysis of Tree Based Decision Principles”
- 15h00 - 16h00: Martin Geiger (Germany), “Genetic Algorithms for multiple objective vehicle routing”
- 17h00 - 19h00: Visit of Toulouse
- THURSDAY 13/9/2001
  - 9h00 - 10h30: Lecture 4a, Daniel Lehmann (Hebrew University of Jerusalem, Israel), “Nonmonotonic Logics and Semantics” (1st part)
  - 10h30 - 11h00: Coffee Break
  - 11h00 - 12h30: Lecture 4b, Daniel Lehmann, Nonmonotonic Logics and Semantics (2nd part)
  - 12h30 - 14h30: Lunch
  - 14h30 - 15h30: Sebastien Konieczny (France), “On the frontier between arbitration and majority”
  - 15h30 - 16h30: Leendert van der Torre (The Netherlands), “Qualitative Decision Making: bridging Artificial Intelligence and Operations Research”
  - 16h30 - 17h00: Coffee Break
  - 17h00 - 18h00: Jorge Riera-Ledesma (Spain), “Solving the Traveling Purchaser Problem”
- FRIDAY 14/9/2001
  - 8h45 - 9h45: Szymon Wilk (Poland), “Supporting Triage of Children with Abdominal Pain in the Emergency Room”
  - 9h45 - 10h45: Marta Omero (Italy), “Intelligent decision support systems based on multiple criteria for performance assessment”
  - 10h45 - 11h15: Coffee Break
  - 11h15 - 12h15: Akos Zsiros (Hungary), “Learning Decision Rules in Continuous Space”
  - 12h15 - 14h30: Lunch
  - 14h30 - 16h30: Round Table Discussion on “Decision Analysis and Artificial Intelligence” organised by Jean-Charles Pomerol (Université Paris VI, France) and Henri Prade (CNRS, Université Toulouse III, France)
  - 20h00: ESI dinner
- SATURDAY 15/9/2001
  - Free Time (Possible Visit of the Cit de lEspace)

- SUNDAY 16/9/2001
  - 8h30 - 19h30: Visit of the ruins of the “Montségur Castle” and visit of the “Niaux cave” (departure at 8h30, meeting point: cité Universitaire de larsenal).
- MONDAY 17/9/2001
  - 9h00 - 10h30: Lecture 5a, Jean-Yves Jaffray (Paris VI University, France), “Bayesians Networks and Influence Diagrams” (1st part)
  - 10h30 - 11h00: Coffee Break
  - 11h30 - 12h30: Lecture 5b, Jean-Yves Jaffray, “Bayesians Networks and Influence Diagrams” (2nd part)
  - 12h30 - 14h30: Lunch
  - 14h30 - 15h30: Philippe Fortemps (Belgium), “Selecting preferred solutions in flexible dynamic programming”
  - 15h30 - 16h30: Pierre Gérard (France), “Generalisation and Latent Learning in Learning Classifier Systems”
  - 16h30 - 17h00: Coffee Break
- TUESDAY 18/9/2001
  - 9h00 - 10h30: Lecture 6, Roman Słowiński (Poznan University of Technology, Poland), “Rough Sets Theory: application to Decision Analysis” (1st part)
  - 10h30 - 11h00: Coffee Break
  - 11h00 - 12h30: Roman Słowiński, “Rough Sets Theory: application to Decision Analysis” (2nd part)
  - 12h30 - 14h00: Lunch
  - 14h00 - 16h00: Lecture 7a, Malik Ghallab (CNRS, LAAS Toulouse, France): “Planning and Decision Theory” (1st part)
  - 16h00 - 16h30: Coffee Break
  - 16h30 - 18h30: Lecture 7b, Hector Geffner (Universidad Simon Bolivar, Caracas, Venezuela), “Planning and Decision Theory” (2nd part)
  - 18h30: JAZZ Concert
- WEDNESDAY 19/9/2001: Within the ECSQARU Conference:
  - 9h00 - 10h00: Hector Geffner, “Planning with Uncertainty and Incomplete Information”
  - In the afternoon, Invited Session on Decision Analysis:
    1. Michel Grabisch, “On Preference Representation on an ordinal scale”
    2. Salvatore Greco, Benedetto Matarazzo, Roman Słowiński, “Rule-based decision support in multicriteria choice and ranking”

3. Céline Lafage and Jerome Lang, “Propositional distance and preference representation”

- THURSDAY 20/9/2001: ECSQARU Conference
- FRIDAY 21/9/2001: ECSQARU Conference

All invited speakers, but one (due to a last minute familiar problem) show up and remain for an average of 3(three) days. Nevertheless the missing lecturer has been replaced by Patrice Perny. Some of them had a very good feeling with the ESI participants. The programme run regularly until Tuesday evening. Then the ESI merged with the ECSQARU conference where one invited speaker and one session were commonly organised. The two events were scientifically very near and the fact that both were occurring at the same time and at the same place suggested to try to combine them. ESI participants were registered as regular participants of the ECSQARU conference (receiving the proceedings volume and the rest of the conference services at a reduced price) and a common invited speaker and invited session was organised.

A number of social activities has been organised:

- a visit at the Toulouse city (Thursday 13/9);
- a visit to the space center of Toulouse (Saturday 15/9);
- a visit to a castle and caves (the whole day of Sunday 16/9);
- a jazz concert (Monday 17/9).

ESI participants were endowed with tickets of the students restaurant (both for lunch and dinner), but almost every second evening a dinner was organised to a local restaurant. ESI participants were hosted at one of the students residence located downtown in Toulouse (“cité Universitaire de l’Arsenal”). This in order to allow the participants to take a taste of the life of Toulouse. Bus tickets were provided in order to allow transportation between the conference location and the residence.

## Feedback and Conclusion

Wednesday 19/9 a feedback meeting has been organised in order to assess the participants experience. A number of points emerged during the discussion, such as:

- tutorial speakers were expected to stay more than what effectively happen;
- tutorial documents might circulate before the beginning of the classes;
- some practice oriented workshop using small groups of participants would

be highly appreciated;

- more software demonstration is asked;
- the education perspective should also be considered within an ESI.

As organisers we would like to mention a number of issues:

- national OR societies, quite often forget to circulate the information;
- as a result there are few candidates and therefore an objective problem of quality of the participants;
- does it make sense to allow the interested to submit directly to the scientific committee?

At the end of the feedback meeting there has been discussion concerning the possibility to create a permanent work around the ESI XIX subject. Philippe Fortemps and Leon van der Torre have been nominated unanimously co-ordinators. They will prepare an application for becoming an EURO working group.

A feature issue of EJOR has been announced during the ESI. Members of the scientific committee are expected to provide some comments to the presented papers in order to meet EJOR standards. Then the regular refereeing procedure will apply. We are confident to be able to close the feature issue by the end of 2002.

Last, but not least, the local organisers (Jerome Lang, Helene Fargier, Céline Lafage) have been warmly thanked for their excellent job in hosting the ESI.



## Annex A: Finance Report

The present report uses the new european currency. Figures had to be adjusted for this purpose. We received the following rough amounts: 16400 € from EURO, 3400 € from Université Paris Dauphine (LAMSADE), 1000 € from Université Paul Sabatier de Toulouse (IRIT) and we should receive 1500 € from Université Paris 6 (LIP6). On the other hand expenditures were: 3700 € for travelling of the invited speakers, 3700 € for the feeding of participants, guests and organisers, 1500 € for guests accommodation, 2500 € for participants accommodation, 1700 € for social activities, 3300 € for the organisation and 1000 € for the participants registration to the EC-SQARU conference. Only 80% of the incoming budget has been finally used and grants will be proportionally refunded to the sponsors. More precisely the following figures hold:

INCOME		EXPENDITURES	
EURO	16388,42 €	Guests transp.	3738,16 €
LAMSADE	3353,88 €	Guests accom.	1562,29 €
IRIT	1067,14 €	Feeding	3709,23 €
LIP6	1500 €	Students accom.	2457,54 €
		Social Act.	1674,67 €
		ECSQARU	1000 €
		Organisation	3377,58 €
TOTAL	22309,44 €	TOTAL	17519,92 €



Figure 1: the ESI participants



Figure 2: picnic within the campus



Figure 3: Hard working 1



Figure 4: Hard working 2





Figure 5: Mountain excursion



Figure 6: Visiting the town



Figure 7: Relaxing after a hard day ...



Figure 8: ... In a beautiful town