

# Workshop on the Theory of Belief Functions

April 1-2, 2010

Brest, France

## General information

### Bus service

The buses are identified by the inscription Veolia (white and red), a notice will indicate "Belief", and the city point is the tourism office.

### Times

Wednesday, March 31

9:45 City point to ENSIETA

18:45 ENSIETA to the city point

Thursday, April 1

7:45 City point to ENSIETA

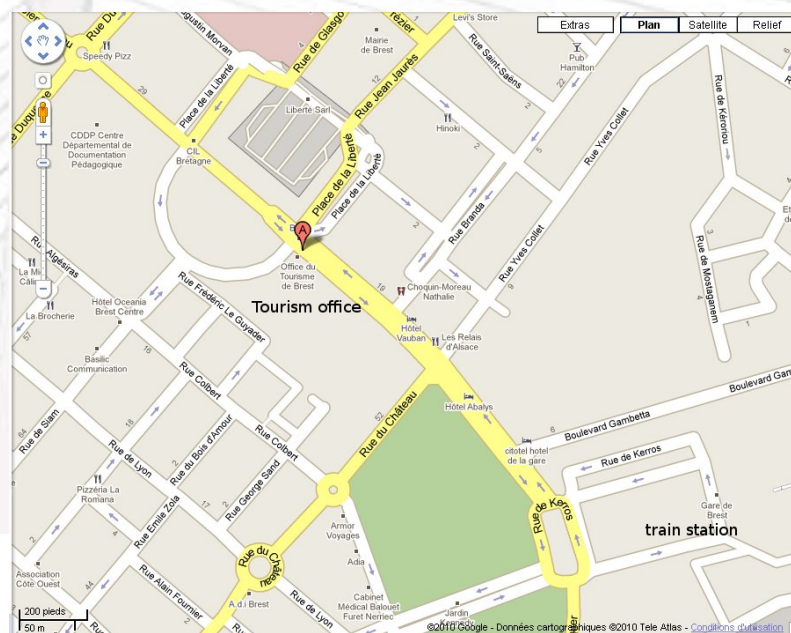
18:00 ENSIETA to Oceanopolis

24:00 Oceanopolis to the city point

Friday, April 2

7:45 City point to ENSIETA

16:30 ENSIETA to the city point



## Belief functions and Applications Society

A first website: <http://www.ensieta.fr/bfas/>

More information will be provided Friday, April, 2.

<http://www.ensieta.fr/belief2010/>



# Program

## Tutorials, March 31, 2010

9:45 Bus from the city point to ENSIETA

10:30-12:30 Theory of belief functions: recent advances and applications to information fusion and machine learning, by Thierry Denoeux

14:00-16:00 Knowledge Propagation in Information Fusion Processes, by Alain Appriou

16:30-18:30 Formal representations of uncertainty, by Didier Dubois

18:45 Bus from ENSIETA to the city point

## Thursday, April 1, 2010

7:45 Bus from the city point to ENSIETA

8:30 Registration

9:00-9:15 Introduction

### 9:15-10:45 Conflict, discounting session – chair: A. Appriou

- On some properties of distances in evidence theory - Anne-Laure Jousselme, Patrick Maupin.
- Extending the contextual discounting of a belief function thanks to its canonical disjunctive decomposition - David Mercier.
- Automatic discounting rate computation using a dissent criterion - John Klein, Olivier Colot.
- Reliability estimation based on conflict for evidential database enrichment - Mouna Chebbah, Boutheina Ben Yaghlane, Arnaud Martin.
- Using the conflict: An application to sonar image registration - Cedric Rominger, Arnaud Martin.

### 10:45-11:00 Coffee break

### 11:00-12:30 Combination rules session – chair: M. Daniel

- Sequential adaptive combination of unreliable sources of evidence - Zhun-ga liu, Quan Pan, Yong-mei Cheng, Jean Dezert.
- Equivalence of Correction and Fusion Schemes Under Meta-Independence of Sources - Frédéric Pichon.
- Idempotent merging of Belief Functions: Extending the Minimum Rule of Possibility Theory - Sebastien Destercke, Didier Dubois.
- On the interest of having different combination rules in the evidence theory framework - Sylvie Le Hégarat-Mascle, Cyrille André, Roger Reynaud.
- Generic implementation of fusion rules based on Referee function - Frédéric Dambreville.

12:30-13:45 Lunch

**13:45-14:45 Invited speaker: Statistical inference from a Dempster-Shafer perspective: What has changed over 50 years? - A. Dempster**

**Chair: T. Denoeux**

**14:45-15:45 Statistics and data analysis session – chair: J. Schubert**

- Maximum likelihood estimation from evidential data - Thierry Denoeux.
- Evidential clustering with constraints and adaptive metric - Violaine Antoine, Benjamin Quost, Marie-Hélène Masson, Thierry Denoeux.
- Signal Detection in Quantized Random Fields Using Dempster-Shafer Theory - Duncan Ermini Leaf, Chuanhai Liu.

**15:45-16:00 Coffee break**

**16:00-18:00 Poster session**

- A combination of ontology fusion and DS<sub>m</sub>T as the way to improve the performance of evidential inference in C2 systems - Ksawery Krenc, Adam Kawalec.
- Defining new approximations of belief functions via a hidden conjunctive combination - Thomas Burger.
- Approximation in DS<sub>m</sub> theory for fusing ESM reports - Pascal Djiknavorian, Dominic Grenier, Pierre Valin.
- Multi-labeled image classification by TBM active learning - Hervé Goeau, Michele Rombaut, Denis Pellerin, Olivier Buisson.
- Belief Function Based Algorithm for Material Detection and Tracking in Construction - Emmanuel Duflos, Saiedeh Razavi, Philippe Vanheeghe, Carl Haas.
- A Verified MATLAB Toolbox for the Dempster-Shafer Theory - Ekaterina Auer, Wolfram Luther, Gabor Rebner, Philipp Limbourg.
- Transferable Belief Model for incorporating failure dependencies in reliability analysis under data uncertainties - Felipe Aguirre, Mohamed Sallak, Walter Schön.
- Non Bayesian Conditioning and Deconditioning - Jean Dezert, Florentin Smarandache.
- Detection of Abnormal Sensor Behaviour using TBM - Bruno Marhic, Laurent Delahoche, Clément Soleau, Anne-Marie Jolly, David Menga.
- Base Rates for Belief Functions - Audun Jøsang, Stephen O'Hara, Kristi O'Grady.
- Geometric conditioning of belief functions - Fabio Cuzzolin.
- A two-step fusion process for multi-criteria decision applied to natural hazards in mountains - Jean-Marc Tacnet, Mireille Batton-Hubert, Jean Dezert.
- Audit Risk Formula with Mixed Evidence - Rajendra Srivastava, Theodore Mock.
- Several Notes on Belief Combination - Milan Daniel.

**18:00 Bus for Oceanopolis**

The Océanopolis is the ocean discovery park. Enjoy the thrill of an unforgettable dinner discovering the world's oceans.

# Friday, April 2, 2010

7:45 Bus from the city point to ENSIETA

**8:30-9:00 Information on the "Belief functions and applications society"**

**9:00-10:30 General topics – chair: R. Srivastava**

- Constructing and Reasoning about Alternative Frames of Discernment - Johan Schubert.
- Auditors' Evidence Evaluation and Aggregation Using Beliefs and Probabilities - Hironori Fukukawa, Theodore Mock.
- Dempster-Shafer reasoning in large partially ordered sets: Applications in Machine Learning - Thierry Denoeux, Marie-Hélène Masson.
- About using beliefs induced by probabilities - Pierre-Emmanuel Doré, Arnaud Martin.
- Continuous belief functions: singletons plausibility function in conjunctive and disjunctive combination operations of consonant bbds - Jean-Marc Vannobel.

**10:30-10:45 Coffee break**

**10:45-12:45 Poster session**

- Characterization and propagation of uncertainties in complex socio-technical system risk analyses - Geoffrey Fallet, Carole Duval, Philippe Weber, Christophe Simon.
- Combination in Multi-View Forests using Dempster-Shafer Evidence Theory - Mohamed Abdel Hady, Friedhelm Schwenker, Günther Palm.
- Representation of parameter uncertainty with evidence theory in Probabilistic Risk Assessment - Tu Duong Le Duy, Dominique Vasseur, Laurence Dieulle, Christophe Berenguer, Mathieu Couplet.
- Evidence Theory and Multiple Criteria Decision Analysis: The Evidential Reasoning Approach - Jian-Bo Yang, Dong-Ling Xu, Xinlian Xie, Anil Kumar Maddulapalli.
- Structure of the Set of Belief Functions Generated by a Random Closed Interval - Tomas Kroupa, Robert Hable.
- An Online Auction Trust Model for Based on the Contextual Information - Ladislav Beranek, Pavel Tlustý, Radim Remes.
- Application of the belief function theory to validate multi-agent based simulations - Alexandre Veremme, Eric Lefevre, Gildas Morvan, Daniel Jolly.
- Pitfalls for recursive iteration in set based fusion - Gavin Powell, Matthew Roberts, David Marshall.
- The barycenters of the k-additive dominating belief functions & the pignistic k-additive belief functions - Thomas Burger, Fabio Cuzzolin.
- Multi-criteria decision making based on DS<sub>m</sub>T/AHP - Jean Dezert, Jean-Marc Tacnet, Mireille Batton-Hubert, Florentin Smarandache.
- Uncertainty in Ontologies: Dempster-Shafer Theory for Data Fusion Applications - Amandine Bellenger, Sylvain Gatepaille.
- A Dempster-Shafer Theoretic Evidence Updating Strategy for Non-Identical Frames of Discernment - Thanuka Wickramaratne, Kamal Premaratne, Manohar Murthi, Matthias Scheutz.
- A new scheme of merger information based on accuracy for image classification - Sébastien Desbouchages, Noël Richard, Anne-Sophie Capelle-Laizé.

12:45-14:00 Lunch

**14:00-15:00 Invited speaker: A betting interpretation for probabilities and Dempster-Shafer degrees of belief - G. Shafer**

**Chair: D. Dubois**

**15:00-16:00 Independence session – chair: B. Ben Yaghlane**

- Factorization and Decomposable Models in Dempster-Shafer Theory of Evidence - Radim Jirousek.
- Independence concepts in evidence theory: some results about epistemic irrelevance and imprecise belief functions - Sebastien Destercke.
- A Thorough Comparison of Two Conditional Independence Concepts for Belief Functions - Jirina Vejnarova.

16:30 Bus from ENSIETA to the city point