

## **Fuzzy Logic and Decision Making Seminar and visit Manchester Business School – 23-24 May, 2015**

### **REPORT - DECISION MAKING AND FUZZY LOGIC IN BRAZIL: Desire, Pricing, Evaluation and Perception**

Striving for international partnerships and scientific collaboration opportunities, Dr. Ilan Chamovitz (MBS visitor) brought five researchers to present Fuzzy projects from Brazil. Presentations had been inserted in Decision and Cognitive Sciences Research Centre Seminar Series 2014/15, in 23rd, May, 2015. The website for this event is <http://api.adm.br/fuzzy>.

Initially Dr. Yu-Wang Chen welcomed all delegates composed by professors and PhD students from Manchester Business School, and the Brazilian Lab Fuzzy team, from Universidade Federal do Rio de Janeiro, COPPE.

Following, Ilan Chamovitz introduced the Brazilian team and the agenda. Then, representing LabFuzzy's team, Fabio Krykhtine, talked about the UFRJ, COPPE and LabFuzzy structure.

Laboratory for Fuzzy Mathematical Modelling is led by two emeritus professors, Carlos Alberto Nunes Cosenza and Francisco Antonio Moraes de Accioli Doria. Labfuzzy is located at Rio de Janeiro Federal University which is ranked as the 1<sup>st</sup> position for federal universities in the country and as the 4<sup>th</sup> in Latin America (QS TopUniversities 2014). Labfuzzy is integrated to Laboratoire d'Automatique et de Recherche opérationnelle (LARA), from Département Transport Aérien de l'École Nationale de l'Aviation Civile (ENAC) in Toulouse, France and holds more than 50 academics in Brazil.

In sequence, 5 presentations were performed:

- **Fabio Luiz Peres Krykhtine, M.Sc.** – A Fuzzy Algorithm for Understanding Customer's Desire
- **Luís Odayr Azevedo Gomes Raymundo, M.Sc.** – A Proposal Model for an Airport Performance Evaluation Using Fuzzy Concept
- **Antonio Carlos Dias Lima Morim, M.Sc.** – Developing new pricing strategy methods for consumer goods using fuzzy logic
- **Guilherme Weber Martins, M.Sc.** – A Fuzzy-Relational Approach for Evaluating the Impact of Educational Methodologies on Students' Lives
- **Paulo de Oliveira Reis Filho, D.Sc.** - Decision Making – Incorporating Cognitive Strategic Approaches When Proposing Urban Interventions

Then, the debate was initiated. Main arisen questions follow:

1. Dr. Babis Theodoulidis (MBS - Service Systems Research Centre) commented about the way linguistics variables had been collected and interpreted among groups surveyed. Presenters clarified it was performed by LabFuzzy researchers and qualified informants.
2. Dr. Babis Theodoulidis (MBS - Service Systems Research Centre) asked if any work has been conducted towards Service applications.

Presenter's response was "yes", as there are projects directly involved with service provision, such as service satisfaction surveys.

3. A PhD student commented about Roberto Marinho Foundation's education project validity and reliability, as results came from sensitivity analysis and expertise. It was explained that due to time, the work could not have been conducted a second time, as desired to have a stronger validation.
4. Professor Jian-Bo Yang (MBS Decision and Cognitive Science Research Centre) contributed with two questions, considering the Roberto Marinho Foundation's education project: first, he asked if correlation was considered among the dimension under evaluation; second, if there was no problem regarding double counting.  
The answer was Yes, correlations were considered, but nothing was specifically done to avoid the double counting problem. After some reflections, the conclusion was that the set of questions used in the research could be improved.
5. Professor Jian-Bo Yang asked: How were picked out the fuzzy set and intervals (overlapping) for each linguistic variable?  
The answer was that it was used an oracle approach. So, the LabFuzzy team had decided what linguistics variables were held.

At the end, Jian-Bo Yang opened discussion for researches collaboration between MBS and LabFuzzy. He exposed his own research interest areas, and referenced projects that anyhow are important for education purposes in Europe.

Aftermath, Professor Jian-Bo talked about the major areas that may be developed in data analytics and related implications towards product development and decision-making. He also said that partnerships between MBS and LabFuzzy would be interested to be done in the future.

Along the second day (24<sup>th</sup>), researchers visited some academics. Dr. Cesar Marin opened opportunities for Brazilians student's interested in Adaptive Systems and correlated areas. Dr. Babis Theodoulidis stated he can collaborate on Text Mining and in the Services Research field.

#### **OUTCOMES:**

Main outcomes from the event are the contacts between academics and students, the intention to for future development and collaboration between MBS and LabFuzzy in order to high quality scientific production; possible Interchange for students and academics – considering seminars and visiting research. Mutual interest themes are Decision Making, Services (Education, Health, etc.), and Fuzzy Logic. Instruments and Techniques to be explored are Text Mining, Interviews, Fuzzy Models, Other Decision Making models.

#### **NEXT STEPS:**

- Dissemination for both organisations about most discussed themes and future actions.
- A meeting via web conference with the leader of this project, Dr Ludmil Mikhailov, the leader on Fuzzy studies at Manchester Business School.
- Lab fuzzy team finding students interested on coming to UK to develop research and produce papers.
- Collaborative research with MBS academics.