

COST Action IC1205 on Computational Social Choice: STSM Report

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Home institution: University of Novi Sad

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Host: Prof. Péter Biró and Prof. Sándor Bozóki

Host institution: Corvinus University of Budapest

Host country: Hungary

Dates: 04/11/2015 to 24/11/2015

The main goal of the Short-term scientific mission was addressing the issues of incomplete information and inconsistency in pair-wise comparison matrices within Analytic Hierarchy Process (AHP) framework and assessing the possibilities for linking AHP with Social choice theory.

Prof. Sándor Bozóki and his research team showed me their most recent papers dealing with pairwise comparison matrices. We were discussing on the suitability of application of different consistency indices, apart from Consistency ratio (CR), such as CM and CI and possibilities for defining the threshold values for these indices depending on the matrix size. Along with this discussion, I had a chance to get aquatinted with the procedures for reducing inconsistency and filling the missing matrices' elements in order to reach the lowest possible consistency violation. We were also discussing on appropriate manner to define questions in the research, for example is the order of the elements to be compared relevant for the final outcome – will the results differ if ordering in questioner is sequential, random or ross, what is the highest percentage of missing judgements that we could take into account for having a reliable decision to conduct, what to do in cases when too many elements are missing – is it better to neglect those and so on. The question of the incomplete information was also explained on the example of the ranking of tennis players. Aggregation of incomplete pairwise comparison matrices in group context was also addressed, it was discussed how the results will differ if one complete all the matrices before aggregation with the case when filling of missing elements was done after the aggregation.

During this research stay I participated at Corvinus Game Theory Seminar and on 9th of November I presented a paper entitled *Impact of different AHP structuring in an environmental decision making problem*. After my presentation, I got a useful feedback from AHP and Game theory experts that can help me to improve my research and consider new research lines in future.

I would like to thank COST Action IC1205 Representatives and my hosts at Corvinus University for giving me such a great opportunity to improve my knowledge and discuss my ideas with leading experts in decision making.