



WT2.18b: University of Granada

Report

Activities performed during the visit

in Wrocław, Poland

period: 02.05.2016 - 18.05.2016

author: Michał Woźniak



Personal Information

Mr. **Manuel Chica**, a member of **University of Granada, Spain** visited **Wroclaw University of Technology, Poland** in the period from **02.05.2016 to 18.05.2016** in order to carry out research and training activities in the field of **System Dynamics and model callibration**.

Information about Seminars

The seminar presentation was organized on **13.05.2016**

And was devoted to presentation of the newly prepared submission to the journal **Information Sciences** and was entitled:

Multimodal optimization: an effective framework for model calibration (13.05.2016)

Description of scientific activities

(Please describe value added to the ENGINE project i.e. new knowledge, new skills with respect to the objectives of the project, the assigned common area of future cooperation with the partner, plans for common research, projects, publications and how it could be used in the scope of ENGINE)

New knowledge:

Mr. Chica has presented work automated calibration of a model that is a crucial stage when validating non-linear dynamic systems. The modeler must control the calibration results and analyze parameter values in an iterative way. In many non-linear models, it is usual to find sets of configuration parameters that may obtain the same model fitting. In these cases, the modeler needs to understand the results' implications and run a sensitivity analysis to check the model validity. During the presentation Mr. Chica presented a newly prepared paper submitted to **Information Sciences** journal that proposes a framework based on niching genetic algorithms to provide modeler with a set of alternative calibration solutions which also ease the analysis of their parameters, model's response, and sensitivity analysis. The framework was called **MOMCA**, an integral and interactive solution for model validation which facilitates the implication of decision makers. The core component of **MOMCA** was its niching genetic algorithm, able to reach various optima in multimodal optimization problems by keeping the necessary diversity. The proposed framework was discussed based on two different case studies. The first case study was a biological growth model and the second one was a managerial model to improve brand equity. Both applications showed the benefits of the framework when providing a set of calibrated models and a way to analyze and perform sensitivity analysis based on the set of solutions.

New skills:

Thanks to Mr. Chica's visit Engine Center's team had a chance to familiarize with specialized skills on system dynamics application and automated calibration of a model.

Common area of future cooperation:

It has been agreed that there will be no further collaboration within the Engine project and all other collaboration will be financed by different source. The general scope of collaboration will be concentrated on:

- diffusion processes in complex networks
- classification in networks
- social network analysis and social media analysis

Plans for common research:

There were not discussed further research activities as all the previous effort was concluded with joint submission to Information Science journal.

Plans for joint projects:

Not defined.

Plans for collaboration in publications preparation:

Not defined.

Information referring to the intellectual property

(the generally binding law in this area in the visited country and procedures of patenting);

Not addressed.

Description of the cooperation between universities and industry

(how it is organized in partner's organization, the sources of funding, the opinions about drawbacks and strengths of existing solution).

Not addressed.

Other activities

None





REMARK: Apart from this information also a program of the visit and the presentation in electronic version should be given to the project office (please send all of them to Urszula.Markowska-Kaczmar@pwr.wroc.pl). Please respond to the points 1-5 for outgoing visit and points 1-3 for incoming visit. Point 6 is for extra activities that are not put in points 1-5.

