

Annex 6: Habilitation thesis reader's report

Masaryk University	
Faculty	MU Faculty of Informatics
Field of Habilitation	Informatics
Applicant	Mgr.Hana Rudová, Ph.D.
Affiliation	Masaryk University, Faculty of Informatics
Habilitation Thesis	Constraint - based Scheduling
Reader	Professor Sanja Petrovic
Affiliation	University of Nottingham

Report Text (as large as the reader deems necessary)

This habilitation thesis describes research work on the development of methodologies for scheduling and rescheduling problems, in particular course timetabling and grid scheduling problems. The developed methodologies include constraint programming, integer programming, branch and bound, and Tabu search. The candidate published 12 papers, two of which will appear in the journals with high impact factor. The remaining ones were published in scientific international conference proceedings, including Springer Lecture Notes which include selected papers from conferences. I find the presented research work to be of high quality. One of its strengths is that it is focused on complex real-world problems, this particularly referring to the tackled course timetabling problems faced by two universities in the Czech Republic and United States. In this context Dr Rudova's research work on rescheduling is also very important. The candidate demonstrated good knowledge of a variety of techniques that can be applied to scheduling problems and good understanding of issues that arise in solving of scheduling problems. In my opinion, this thesis **does meet** the standard requirements for a habilitation thesis.

Reader's questions to answer to defend the habilitation thesis (number of questions is upon reader's consideration)

1. The introductory chapters (1-6) give an overview of the main contribution of the thesis. I find it nicely structured into modelling, search, applications, and future work, but cannot see reasons for separating modelling and optimisation. Please comment on this.
2. Dr Rudova mentions interesting topics for her future research work. I am also interested whether the candidate plans to consider some other scheduling problems. Which classes of scheduling problems are the described methodologies applicable to? How flexible are these methodologies to be applied to some other different classes of problems and how much effort would this involve?
3. The candidate describes the multicriteria nature of the scheduling problems (discussed in the context of grid scheduling). The thesis discusses one approach which is often in use, namely the weighted sum of objectives (for example, objectives measure the violations of soft constraints). This approach, although being used often in the literature, faces the problem of

setting weights which should reflect the importance of objectives but also have to handle different measurement units and different range of values of objectives. Does the candidate consider investigating other multiobjective optimisation methods, for example multiobjective evolutionary optimisation methods?

Conclusion

Hana Rudova's habilitation thesis of "Constraint - based Scheduling" *does* meet the standard requirements for a habilitation thesis in the field of Informatics.

In Nottingham on ...26/07/2010 Sanja Petrovic ...

Sanja Petrovic

....(signature)