< SIMULATION TESTING AN EMPIRECAL STUDY>

By
< Abdulmula Margani>

A DISSERTATION

Submitted to

The University of Liverpool

In partial fulfillment of the requirements for the degree of

MASTER OF COMPUTER SCIENCE

Abstract

The original aim of this project was to implement two such algorithms to check the existence of simulation relation between two transition systems and compare their performance. The project has been into different stages to be completed, I have presented each stage of the project as well as write full dissertation of the all project. The specification stage includes explanation of the aims of the project the project, the requirement of the project and well-structured plan of each stage of the project following that is the background on the project to give related ideas and information how the project has been conceived. This includes research on the subject of labelled systems and simulation relation and research into previous work that was done in this subject. And then I have realised what software is required to create the program. The design stage includes summary of proposal as well as a detailed design of the project This includes a description of the research carried out using case studies of the project where the project has been putted into terms and diagrams which are easy and understandable for the user and the reader design methods have been used for helping me to understand what is required when the implementation stage is approached. Implementation stage could be seen as crucial part of this project.

Implementation has been done using JAVA programming language where the program has been written to implement the selected algorithm and then the algorithm has been implemented to expect some values as inputs and gives outputs these outputs can be used to evaluate the performance of the implemented algorithm and by reaching this level evaluation stage has been approached. Evaluation stage is very important stage, it has been absolutely crucial to evaluate and test the developed algorithm based on the studied algorithm. I conducted five testes experiments on the developed algorithm the first three experiments to determine if the system fulfils the requirements of the defined data structure and the last two experiments were carried out to reveal if the system behaves normally and produces the correct results on the basis of one different and the other one with the same inputs all testes were successful, this further proved that I have developed system as part of this project. I believe that I achieved part of the set aims and objectives of this project. This research not only for someone who is interested in finding more about simulation relation but also for ongoing research in area of computer science. Key words: labelled Transition Systems, States, Transitions, Labels, Start State, Simulation relation, Data Structure, Algorithm

DECLARATION

I hereby certify that this dissertation constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

I declare that the dissertation describes original work that has not previously been presented for the award of any other degree of any institution.

Signed

Abdulmula Margani

"This dissertation contains material that is confidential and/or commercially sensitive. It is included here on the understanding that this will not be revealed to any person not involved in the assessment process".

Acknowledgement

It is a pleasure to thank those who made this thesis possible. I am heartily thankful to those who guided and helped me with the research material through the different stages of the project. I am grateful for support and advice from the lecturers for the project in particular my supervisors for this project Professor Frank Wolter and Dr Boris Konev