Project Report # 1

EEC 522

By

Sushant Arora

Syed Sharique Ali

Introduction

SPIN (Simple Promela Interpreter),a model checking tool,was developed by Bell Labs in 1980s by Gerald J. Holzmann, and is used to verify the correctness of distributed system,where distributed system are systems in which various parts of program run on multiple computers at the same time and they are connected to each other.

Here, the system to be verified is written in Promela(Process Meta Language) and properties are written in Linear Temporal Logic(LTL) eg Q1 W Q2 etc.Where Promela consists of process templates and process instantiations and these templates define the behaviour of different types of processes and also it converts the LTL specifications in Büchi automaton.The global behaviour of distributed systems is achieved by computing interleaving product of automata which is reffered ad state space of the system.SPIN then computes the synchronous product of properties and state space and produces the result in state space if result is empty then it means property is not satisfied and if result is non empty then we get set of those properties that satisfy the system.

State Compression

Since there are many states in state space that to find the solution becomes difficult and in such situation we need to compress the state space.This can be achieved here by the fact that every process in Promela specifications has small number of local states and large number of global states can be large number of combinations of local processes collected together.Thus by keeping local and global states separate state compression can be achieved and it reduced the memory overhead.

References

http://spinroot.com/spin/whatispin.html

http://en.wikipedia.org/wiki/SPIN_model_checker

IEEE97 paper published by Gerald J holzmann.