

Formal Methods for System Verification

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This project consists of applying stochastic modelling techniques to model

A Non-Repudiation Protocol.

You are at liberty to choose the particular system which you model.

The steps which you need to take are these:

1. write a short introduction containing an informal, but careful, explanation of the problem which you wish to model;
2. consider the system which you are modeling and identify the components of interest and the activities which they undertake either individually or in co-operation;
3. describe these components behaviourally, explaining how they interact with each other;
4. express each component as a high-level description in the PEPA stochastic process algebra;
5. express the entire system in the PEPA process algebra as the co-operation of the above components;
6. draw the derivation graph of your model (or part of it);
7. define the infinitesimal generator matrix \mathbf{Q} of the Markov process underlying your system;
8. express at least three quantities of interest in the model (e.g. steady state probabilities, throughput, utilisation, expected response time, number of jobs) through a formula that can be evaluated.
9. encode the system with the PEPA Eclipse Plug-in and compute some measure.