

Distributed Computing over the Internet,  
CSCI-6500  
Project Proposal  
October 29, 2010

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## Paper Selection

I choose to present the paper "On the Fly Estimation of the Processes that Are Alive in an Asynchronous Message-Passing System" by Achour Mostefoui, Michel Raynal and Gilles Tredan which appeared in IEEE Transactions on Parallel and Distributed Systems, pp. 778-787, June, 2009.

I enjoyed reading the paper and feel that its topic is very important to a course such as this, especially as we begin to write code for distributed systems. The code we write will inevitably be quite terrible and will crash, leaving our system with missing parts that we expected to be present. Having the ability to estimate how many of our distributed processes have crashed is helpful in debugging the systems we will write both as a part of this course and when distributed systems become more prevalent.

## Project Proposal

My project will consist of implementing the system described by the authors of the paper in SALSA. Admittedly the system the authors devise does not map well to a SALSA environment. Due to this I plan to implement several variations of their system. The first is a near-exact model of the author's

system. The next is a system with less omniscient clique-like design, the processes (actors) will not all know each other as in the author's system. Another variation is that of systems that are changing in the number of processes in the global system, something the authors do not consider. Finally, I plan to use this system on actual networks and not simulated ones as the authors do. This will give a much more realistic picture of how distributed systems perform in the real world.

This proposal is not without problems from the get-go. Use of real networks requires existence of SALSA-enabled machines that are available to use. Ideally they would be geographically distributed as well, not all concentrated in a dorm room or on the RPI campus. Extending the model that the authors present may be beyond my ability. It seems that they eliminated these considerations to simplify the scope of their paper, so how difficult these variations will be to implement in relation to my own theoretical capabilities remains to be seen.

## Project Modifications

If implementation of this system and its variations comes more easily than I anticipate I am open to any additions deemed worthy. The same is true of difficulty and removing aspects. I intend to, at the very least, implement the system described by the authors (or its SALSA equivalent). The non-omniscient variation should not be too difficult once that is complete. Dynamic systems should provide some difficulty and may require some theoretical work (or more literature reading). I am open to any suggestions and comments.