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ANUNCIO DE CONFERENCIA

Formal Verification of Distributed Algorithms in the Heard-Of Model

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Aula 6• 10 de junio de 2009 • 12: 00

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resumen:

Distributed algorithms are often quite subtle, in the way they operate and in the assumptions they make. Formal verification is therefore crucial in distributed computing. To facilitate their design and understanding, many existing distributed algorithms are structured in rounds: each process first sends messages, then receives messages from other processes, and finally makes a local state transition. However, existing formal models of distributed algorithms do not take advantage of this structure, but are based on a fine-grained description of systems whose individual processes are represented by communicating state machines. Charron-Bost and Schiper recently proposed the Heard-Of (HO) model, a model for fault-tolerant distributed computing based on communication-closed rounds. In this model, many system properties can be verified over a coarse-grained abstraction where runs are modeled as a sequence of global system rounds.

In this talk, we discuss the model and the justifications for the coarse-grained abstraction. We then demonstrate that it greatly simplifies the verification of distributed consensus algorithms, both by model checking and by interactive verification in a proof assistant.