Monday 12 December 2016
12h30 – 14h00
UT1 Capitole, Manufacture des Tabacs, Salle ME302

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How to rapidly share knowledge by gossiping

Abstract: In epistemic logic, the modal logic of knowledge, knowledge is usually modelled by a graph of possible worlds, representing the alternatives to the current state of the world. Edges between worlds stand for indistinguishability; to know a proposition means that this proposition is true in all possible alternatives. Theoretical computer scientists however noticed that this led to several issues, both intuitively and technically: the more an agent is ignorant, the more alternatives she must consider; models may then become too big for system verification. They recently investigated how knowledge could be reduced to the notion of visibility. Intuitively, the idea is that when an agent sees something, then she knows its truth value. The other way round, any combination of truth values of the non-observable variables is possible for the agent. Such observability information allows us to reconstruct the standard semantics of knowledge: two worlds are indistinguishable for an agent if and only if every variable observed by her has the same value in both worlds. In this talk, we present a recent logic of knowledge based on visibility and illustrate it with the gossip problem, a problem of communication in a network of agents.