SAID BUSINESS SCHOOL, University of Oxford

SEMINAR SERIES / TRINITY 2010

Convenors: Felix Reed-Tsochas, Institute for Science, Innovation and Society, Saïd Business School
Eduardo López, Saïd Business School

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Seminar webpage: www.cabdyn.ox.ac.uk/complexity_seminars.asp

Sandwiches and drinks will be provided

Please note: although the seminar programme detailed was correct at time of printing, seminar arrangements are subject to change – for the latest information, please check the seminar webpage.

Tuesday 4th May

(12.30 – 2.00pm) James Martin Seminar Room

Dr Ganesh Ayalvadi
Department of Mathematics, University of Bristol

'Probabilistic Consensus via Polling and Majority Rules'

ABSTRACT

We consider lightweight decentralized algorithms for achieving consensus in distributed systems. Each member of a distributed group has a private value from a fixed set consisting of, say, two elements, and the goal is for all members to reach consensus on the majority value. We explore variants of the voter model applied to this problem. In the voter model, each node polls a randomly chosen group member and adopts its value. The process is repeated until consensus is reached. We generalize this so that each member polls a (deterministic or random) number of other group members and changes opinion only if a suitably defined super-majority has a different opinion. We show that this modification greatly speeds up the convergence of the algorithm, as well as substantially reducing the probability of its reaching consensus on the incorrect value.

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