



ΟΜΙΛΙΑ

“Leader Election in Large Scale Distributed Systems”

Shantanu Das

Associate Professor,
Aix-Marseille University,
Marseille, France



ΠΕΡΙΛΗΨΗ – ABSTRACT

The problem of leader election is fundamental in decentralized distributed systems of autonomous processors that communicate with each-other. Solutions exist when the processors have enough memory to count up to the number of processors, called the size of the system.

In this talk we focus on a particular system called programmable matter where the processors are tiny machines but the size of the system can be arbitrarily large. Due to scalability issues, each processor has constant memory capacity, independent of the size of the system. This constraint makes it challenging to design algorithms for electing a global leader in such systems. We present some solutions to the problem for specific cases that exploit the geometrical properties of the system, in order to elect a unique leader. We will discuss the solvability of the problem under specific conditions and eventually talk about self-stabilizing algorithms where the system can recover from possibly corrupt states and stabilize to a correct configuration solving the leader election problem.

Short Bio:

Shantanu Das received his PhD in Computer Science from the University of Ottawa - Carleton University, Canada, 2007. Since 2013 is an Associate Professor at the CNRS Laboratory of Computer Science and Systems (LIS), Aix-Marseille University, France. He has been a postdoctoral researcher at the Ben-Gurion University of the Negev, and the Technion-Israel Institute of Technology, Israel and at the Laboratoire d'Informatique Fondamentale (LIF), Marseille, France. His research interests include Design and Analysis of Distributed Algorithms, Combinatorial Optimization and Graph Algorithms, Distributed Robotics and Programmable matter, Fault tolerance in Networks and Distributed systems and Algorithms for Sensor Networks and Dynamic Networks. [More Information.](#)

Παρασκευή 31 Ιανουαρίου 2025

12:00 -13:00

Αίθουσα Σεμιναρίων