

# Participating Sets, Simulations, and the Consensus Hierarchy

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## Abstract

The participating set problem can be solved in an asynchronous system using only registers. I will gently explain this problem and its solution, followed by a new extension, called consistent ordered partition. Next, I will present a wait-free simulation by  $f + 1$  processes of any set-consensus algorithm that tolerates  $f$  faults. I will also describe how to extend this simulation using consistent ordered partition. Finally, I will discuss how this extension can be used to prove that, within every level  $m > 1$  of the consensus hierarchy, there is an infinite sequence of increasingly more powerful deterministic objects.

**1998 ACM Subject Classification** C.2.4 Distributed Systems

**Keywords and phrases** Consensus, shared-memory systems

**Digital Object Identifier** 10.4230/LIPIcs.OPODIS.2016.4

**Category** Keynote



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20th International Conference on Principles of Distributed Systems (OPODIS 2016).

Editors: Panagiota Fatourou, Ernesto Jiménez, and Fernando Pedone; Article No. 4; pp. 4:1–4:1

Leibniz International Proceedings in Informatics



LIPICs Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Dagstuhl Publishing, Germany

