

Process Algebra and Bisimulation Techniques for Information Security

Ravi Akella, Dr. Bruce McMillin

ABSTRACT

Information flow typically refers to the direct as well as implicit information resulting from the interaction of cyber processes constituting a system. Information flow also occurs in cyber-physical systems (CPSs). Information flow is difficult to detect in CPSs, due to their physical nature and complex interactions among various computational and physical components. In this work, formal methods of security specification and verification are extended to describe confidentiality in CPSs. This paper presents a general approach to specify and verify information flow properties, such as non-deducibility, in a CPS using bisimulation techniques.