Colloquium d'Informatique de l'UPMC Sorbonne Universités

Laws of concurrent system design

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The algebraic laws that govern the behaviour of concurrent systems, with both sequential and concurrent composition, are as simple as the familiar laws of arithmetic learnt at school. They are strong enough to derive the structural rules of Hoare logic, which were designed as a proof system for verification of programs. They also derive the rules of O'Hearn's separation logic. They also derive the rules of a structural operational semantics, such as those used by Milner to define validity of an implementation of CCS. The laws are simpler than each of these calculi separately, and stronger than both of them combined.

Tony Hoare is one of the founders of modern informatics. He invented pre/post-condition logic, Quicksort, monitors and CSP, and was a pioneer of concurrent programming. He is a Fellow of the Royal Society since 1982 and was awarded the ACM Alan Turing Prize in 1980, the Kyoto Prize in 2000, and the John von Neumann medal in 2011.

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