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**High-Level Message Sequence Charts: Satisfiability and Realizability Revisited**

Message sequence charts (MSCs) visually represent interactions in distributed systems that communicate through FIFO channels. High-level MSCs (HMSCs) extend MSCs with choice, concatenation and iteration, allowing for the specification of complex behaviors. This talk will cover two classical problems for HMSCs: satisfiability and realizability. Satisfiability (also known as reachability or nonemptiness) asks whether there exists a path in the HMSC that gives rise to a valid behavior. Realizability concerns translating HMSCs into communicating finite-state machines to ensure correct system implementations.

While most positive results assume bounded channels, we recently introduced a class of HMSCs that allows for unbounded channels while maintaining effective implementations. On the other hand, the corresponding satisfiability problem is still undecidable.

This is based on joint work with Benedikt Bollig and Paul Gastin.