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Abstracts of Plenary and Invited Lectures

Section:

12. Probability and Statistics

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State Space Collapse for Queueing Networks

The diffusive limits of queueing networks, known as heavy traffic limits, are a topic of continuing interest. Until recently, the class of networks for which these limits had been derived was restricted. An important ingredient in such work is the demonstration of state space collapse, which says that, in the limit, the process must live on an appropriate invariant subspace. In an accompanying talk, Williams provides general conditions under which state space collapse suffices for heavy traffic limits. Here, we discuss how state space collapse can be reduced to the problem of showing the stability of the associated fluid model equations, which are the deterministic analog of the queueing network. We also discuss how these equations can be solved for various queueing networks, such as first-in first-out (FIFO) networks of Kelly type and certain static priority networks.