

Positive systems and the internet

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Abstract

Recent years have seen an increased interest in congestion control for the internet. Typically, congestion control algorithms have been designed based upon fluid models of communication networks. In this talk we propose an alternative random-matrix model of communication networks that use TCP-like congestion control algorithms. We show that essential features of such networks may be captured using this model in a simple manner using basic results from positive linear systems. These results suggest several new strategies for designing congestion control strategies.