Abstract

Mathematical Analysis of Multifractal Nature of Network Traffic

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In this BSc thesis I consider a mathematical model of TCP traffic, which is the major traffic in the internet. I introduce both the mathematical and engineering background of the model and present a resent research result by Lévy-Véhel and Rams regarding the multifractality of TCP Reno.

This work consists of three main parts. First, I would like to give an introduction of a special, not so known family of stochastic processes, which are Markov chains on general state space.

The second part is about the engineering background of the model, including the general mathematical modeling structures of network traffic and the multifractal nature of network traffic via its self-similarity.

Finally, I will present the previously mentioned TCP Reno model and a recent research result regarding its multifractality by Lévy-Véhel and Rams.

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