"Influence of packet loss in networked control systems with linear discrete-time, time-invariant plants "

Networked control systems (NCS) are defined as control systems with at least one link (interconnection between elements) being a real-time network. It means that some information (plant input, output or reference input etc.) is exchanged through the network. The simplest open loop configuration is shown on fig. 1.

Figure 1. The simplest configuration of NCS system without feedback loop. Main differences between networked control systems in respect to classical directly wired systems follows from phenomena such as packet dropouts and packet delays. In general such effects can results in different dynamical properties of the system.

The main problems connected to NCS with TCP/IP protocol will be discussed. An algorithm for numerical evaluation the impact of network effects for given probability of packet lost and packet delays will be proposed. The network impact indicator is calculated in frequency domain using SVD-DFT transformation of system operator defined on finite time horizon.