A Packet Loss Probability Estimation Filter Using Most Recent Finite Traffic Measurements

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Abstract : A packet loss probability (PLP) estimation filter with finite memory structure is proposed to estimate the packet rate mean and variance of the input traffic process in real-time while removing undesired system and measurement noises. The proposed PLP estimation filter is developed under a weighted least square criterion using only the finite traffic measurements on the most recent window. The proposed PLP estimation filter is shown to have several inherent properties such as unbiasedness, deadbeat, robustness. A guideline for choosing appropriate window length is described since it can affect significantly the estimation performance. Using computer simulations, the proposed PLP estimation filter is shown to be superior to the Kalman filter for the temporarily uncertain system. One possible explanation for this is that the proposed PLP estimation filter can have greater convergence time of a filtered estimate as the window length M decreases.