Active Fault Diagnosis in Sampled-data Systems - DTU Orbit (08/11/2017)

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The focus in this paper is on active fault diagnosis (AFD) in closed-loop sampleddata systems. Applying the same AFD architecture as for continuous-time systems does not directly result in the same set of closed-loop matrix transfer functions. For continuous-time systems, the LFT (linear fractional transformation) structure in the connection between the parametric faults and the matrix transfer function (also known as the fault signature matrix) applied for AFD is not directly preserved for sampled-data system. As a consequence of this, the AFD methods cannot directly be applied for sampled-data systems. Two methods are considered in this paper to handle the fault signature matrix for sampled-data systems such that standard AFD methods can be applied. The first method is based on a discretization of the system such that the LFT structure is preserved resulting in the same LFT structure in the fault signature matrix as obtained for continuous-time systems. The other method is an approximation method, where the same structure is obtained for small parametric faults.

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