Geometrical Characterization of Observability in Interpreted Petri Nets

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Abstract: This work is concerned with observability in Discrete Event Systems (*DES*) modeled by Interpreted Petri Nets (*IPN*). Three major contributions are presented. First, a novel geometric characterization of observability based on input-output equivalence relations on the marking sequences sets is presented. Later, to show that this characterization is well posed, it is applied to linear continuous systems, leading to classical characterizations of observability for continuous systems. Finally, this paper translates the geometric characterization of observability into structural properties of the *IPN*. Thus, polynomial algorithms can be derived to check the observability in a broad class of *IPN*.