OBSERVER LINEARIZATION OF NONLINEAR SYSTEMS BY GENERALIZED TANSFORMATIONS

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ABSTRACT

In this paper, we study the problem of observer linearization for single output dynamical systems in the presence of an output-dependent time-scaling transformation and a simultaneous output diffeomorphism. The approach, based on an exterior calculus approach, provides a constructive approach to the problem of equivalence of a locally observable nonlinear system to a linear observer form by means of an output dependent time-scale transformation, an output diffeomorphism and a state-space diffeomorphism. A generalization of existing results is obtained which allows the treatment of a larger class of locally observable nonlinear systems.

Key Words: Observer linearization, nonlinear observers, time-scaling transformation.