Dynamics and Control in Hybrid Systems with Singular Guards

William Clark[2*]

Department of Mathematics,
Ohio University, Athens, OH[2]

Abstract

For optimal control of hybrid systems many, quite severe, regularity assumptions are commonly assumed, e.g. that there are a finite number of isolated known reset times and that the resulting adjoint equations are solvable. This talk demonstrates that systems with linear data subvert these assumptions. In particular, beating and blocking always occur while Zeno is reasonably common. Moreover, the solvability of the adjoint reset conditions is dependent on the interaction between the controls and the guard. Examples are presented to make these issues concrete.

*Partially supported by the Air Force Office of Scientific Research under the Award No: MURI FA9550-23-1-0400, e-mail: clarkw3@ohio.edu