

GRADUATE COURSE ON ROBUST HYBRID CONTROL SYSTEMS – Homework #1

Suggested reading: First 5 pages of

R. Goebel, R. G. Sanfelice and A. R. Teel. Hybrid Dynamical Systems. IEEE Control Systems Magazine, 2009.

which is available from

http://www.u.arizona.edu/~sricardo/Preprints/2009/Goebel-2009_preprint.pdf

and Chapter 1 of

R. Goebel, R. G. Sanfelice and A. R. Teel. Hybrid Dynamical Systems: Modeling, Stability, and Robustness, Princeton University Press, 2012

which is available from

<http://press.princeton.edu/chapters/s9759.pdf>

Problem 1 (*100 points*) Select a hybrid system of your interest, explain why is hybrid, describe its behavior, and model it as a hybrid system with data

$$(C, f, D, g)$$

Pick an appropriate set of parameters for your system and discuss the possible system trajectories.

Note: *Make sure it is not a simple dynamical system with discontinuous right-hand side, and that there is truly hybrid (flowing and jumping) behavior.*