Hybrid systems with memory: existence and well-posedness of generalized solutions. (English) Zbl 1385.34050
SIAM J. Control Optim. 56, No. 2, 1011-1037 (2018).

MSC:
34K34 Hybrid systems of functional-differential equations
34A38 Hybrid systems of ordinary differential equations
93D09 Robust stability
34K20 Stability theory of functional-differential equations
34K09 Functional-differential inclusions

Keywords:
hybrid systems; time delay; functional inclusions; generalized solutions; basic existence; well-posedness; robust stability

Full Text: DOI arXiv

References:
[1] J. P. Aubin, \textit{Viability Theory}, Birkhäuser, Boston, 1991.
[2] G. Ballinger and X. Liu, \textit{Existence and uniqueness results for impulsive delay differential equations}, Dyn. Contin. Discrete Impuls. Syst., 5 (1999), pp. 579–592. - Zbl 0955.34068
[3] W.-H. Chen and W. X. Zheng, \textit{Input-to-state stability and integral input-to-state stability of nonlinear impulsive systems with delays}, Automatica J. IFAC, 45 (2009), pp. 1481–1488. - Zbl 1166.93370
[4] M. Cloosterman, N. van de Wouw, W. Heemels, and H. Nijmeijer, \textit{Stability of networked control systems with uncertain time-varying delays}, IEEE Trans. Automat. Control, 54 (2009), pp. 1575–1580. - Zbl 1367.93459
[5] R. Goebel, J. Hespanha, A. R. Teel, C. Cai, and R. G. Sanfelice, \textit{Hybrid systems: Generalized solutions and robust stability}, in NOLCOS, IFAC, Stuttgart, 2004, pp. 1–12.
[6] R. Goebel, R. G. Sanfelice, and A. R. Teel, \textit{Hybrid Dynamical Systems: Modeling, Stability, and Robustness}, Princeton University Press, Princeton, NJ, 2012. - Zbl 1241.90002
[7] R. Goebel and A. R. Teel, \textit{Solutions to hybrid inclusions via set and graphical convergence with stability theory applications}, Automatica J. IFAC, 42 (2006), pp. 573–587. - Zbl 1106.93042
[8] G. Haddad, \textit{Monotone viable trajectories for functional differential inclusions}, J. Differential Equations, 42 (1981), pp. 1–24. - Zbl 0472.34043
[9] J. Liu, X. Liu, and W.-C. Xie, \textit{Generalized invariance principles for switched delay systems}, IMA J. Math. Control Inform., 28 (2011), pp. 19–39. - Zbl 1212.90090
[10] J. Liu, X. Liu, and W.-C. Xie, \textit{Input-to-state stability of impulsive and switching hybrid systems with time-delay}, Automatica J. IFAC, 47 (2011), pp. 899–908. - Zbl 1233.93083
[11] J. Liu and A. R. Teel, \textit{Generalized solutions to hybrid systems with delays}, in Proceedings of the CDC, IEEE, Piscataway, NJ, 2012, pp. 6169–6174.
[12] J. Liu and A. R. Teel, \textit{Hybrid systems with memory: Modelling and stability analysis via generalized solutions}, in IFAC Proceedings, (2014), pp. 6019–6024.
[13] J. Liu and A. R. Teel, \textit{Hybrid dynamical systems with finite memory}, in Recent Results on Nonlinear Delay Control Systems, Springer, Cham, Switzerland, 2016, pp. 261–273. - Zbl 1384.93065
[14] J. Liu and A. R. Teel, \textit{Invariance principles for hybrid systems with memory}, Nonlinear Anal. Hybrid Syst., 21 (2016), pp. 130–138. - Zbl 1344.34082
[15] J. Liu and A. R. Teel, \textit{Lyapunov-based sufficient conditions for stability of hybrid systems with memory}, IEEE Trans. Automat. Control, 61 (2016), pp. 1057–1062. - Zbl 1359.93396
[16] K.-Z. Liu and X.-M. Sun, \textit{Razumikhin-type theorems for hybrid system with memory}, Automatica J. IFAC, 71 (2016), pp. 72–77. - Zbl 1343.93073
[17] X. Liu and G. Ballinger, \textit{Uniform asymptotic stability of impulsive delay differential equations}, Comput. Math. Appl., 41 (2001), pp. 903–915. - Zbl 0989.34061
[18] X. Liu and J. Shen, \textit{Stability theory of hybrid dynamical systems with time delay}, IEEE Trans. Automat. Control,
[19] R. Postoyan, P. Tabuada, D. Nešić, and A. Anta, A framework for the event-triggered stabilization of nonlinear systems, IEEE Trans. Automat. Control, 60 (2015), pp. 982–996. - Zbl 1360.93567

[20] R. T. Rockafellar and R. J. B. Wets, Variational Analysis, Grundlehren Math. Wiss. 317, Springer, Berlin, 1998.

[21] R. G. Sanfelice, R. Goebel, and A. R. Teel, Invariance principles for hybrid systems with connections to detectability and asymptotic stability, IEEE Trans. Automat. Control, 52 (2007), pp. 2282–2297. - Zbl 1366.93554

[22] R. G. Sanfelice, R. Goebel, and A. R. Teel, Generalized solutions to hybrid dynamical systems, ESAIM Control Optim. Calc. Var., 14 (2008), pp. 699–724. - Zbl 1147.93032

[23] R. Sipahi, S. I. Niculescu, C. T. Abdallah, W. Michiels, and K. Gu, Stability and stabilization of systems with time delay, IEEE Control Syst., 31 (2011), pp. 38–65. - Zbl 1395.93271

[24] X.-M. Sun and W. Wang, Integral input-to-state stability for hybrid delayed systems with unstable continuous dynamics, Automatica J. IFAC, 48 (2012), pp. 2359–2364. - Zbl 1257.93089

[25] P. Yan and H. Özbaş, Stability analysis of switched time delay systems, SIAM J. Control Optim., 47 (2008), pp. 936–949. - Zbl 1157.93462

[26] K. Yosida, Functional Analysis, Springer, New York, 1980. - Zbl 0435.46002

[27] R. Yuan, Z. Jing, and L. Chen, Uniform asymptotic stability of hybrid dynamical systems with delay, IEEE Trans. Automat. Control, 48 (2003), pp. 344–348. - Zbl 1364.93094

[28] Y. Zhang, M. Wang, H. Xu, and K. L. Teo, Global stabilization of switched control systems with time delay, Nonlinear Anal. Hybrid Syst., 14 (2014), pp. 86–98. - Zbl 1292.93105

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.