Denis Efimov (Lille)

Title. Homogeneity with respect to a part of variables and accelerated stabilization

Abstract. The presentation addresses the problem of transforming a locally asymptotically stabilizing time-varying control law to a global one with accelerated finite/fixed-time convergence rates. The approach relies on an extension of the theory of homogeneous systems to homogeneity only with respect to a part of the state variables and on the associated partial stability properties. The proposed control design builds upon the kind of approaches first studied in [MCloskey&Murray,1997] and uses the implicit Lyapunov function framework. A sampled-time implementation scheme of the control law is also presented and its properties are characterized. The method is illustrated by finite-time and nearly fixed-time stabilization of a nonholonomic integrator.