

Time-Varying Stabilization of General Nonholonomic Systems in the Sense of Classical Solutions

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We address the problem of stabilizing driftless control-affine systems that satisfy the Lie algebra rank condition (LARC). In our earlier work, a control design scheme with trigonometric dither components was proposed to stabilize the equilibrium of a nonholonomic system under broad controllability assumptions. This approach relies on a sampling-based framework, which differs from the classical notion of solutions for the associated nonautonomous closed-loop system. In this talk, we establish sufficient conditions that ensure the convergence of classical solutions of the closed-loop system to the equilibrium. The proposed conditions and design procedure are applied to several nonholonomic systems and illustrated through numerical simulations. This talk is partially based on [1].

Literatur

- [1] Zuyev, A.; Grushkovskaya, V.: On classical solutions in the stabilization problem for nonholonomic control systems with time-varying feedback laws, arXiv preprint arXiv:2503.18006, 2025.