

We consider the tracking of geometric paths in output spaces of nonlinear systems subject to input and state constraints without pre-specified timing requirements, commonly referred to as constrained output path-following problems. Specifically, we propose a predictive control approach to constrained path-following problems with and without velocity assignments. We present sufficient convergence conditions based on terminal regions and end penalties. Furthermore, we analyze the geometric nature of constrained output path-following problems and thereby provide insight into the computation of suitable terminal control laws and terminal regions. We draw upon an example from robotics to illustrate our findings.