Error estimates for the pointwise tracking optimal control problem of the Stokes equations

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The purpose of this work is to derive error estimates for the pointwise tracking optimal control problem of the Stokes equations. This linear-quadratic optimal control problem entails the minimization of a cost functional that involves point evaluations of the velocity field that solves the state equations. We also consider box constraints on the control variable. To approximate the solution of this problem, we consider the lowest - order Taylor Hood scheme. Finally, we perform some numerical experiments that illustrate our theory.