

1096-VG-2218      **Brandon J Wilson\*** (pandamathium@gmail.com), 361 N 300 W Apt 207, Provo, UT 84601.  
*Time Optimal Control in General Relativity.* Preliminary report.

Optimal control is the process of trying to steer or control a system from one state to a more preferred state while minimizing a cost functional. Current research on systems modeled on the principles of Einstein's theory of General Relativity are focused on finding geodesics in certain classes of Finsler metrics, rather than optimal control proper. This is effective in giving optimality conditions, but does not combine as well with other control theoretic concerns such as stability and control of noisy systems. Jose Natario and Pedro Henriques recast these problems in the language of differential geometric control theory with a particular emphasis on fuel optimal control. We give an overview and consider time-optimal control which has a number of distinct possible definitions in the relativistic setting. In particular we focus on conditions when the same trajectory is the optimal solution for differing time functions. (Received September 17, 2013)