

M. d. R. de Pinho* and **M. M. A. Ferreira** (`{mrpinho,mmf}@fe.up.pt`), ISR and Faculdade de Engenharia da Universidade do Porto, FEUP-DEEC, Rua Dr. Roberto Frias, 4200-465 Porto, Portugal, and **F. A. C. C. Fontes** (`ffontes@math.uminho.pt`), Universidade do Minho, 4800-058 Guimarães, Portugal, *Euler-Lagrange Inclusions for Optimal Control Problems*

Necessary conditions of optimality in the form of an Euler Lagrange Inclusion (ELI) are derived for optimal control problems with state constraints. The conditions presented here generalize earlier optimality conditions to problems that may be nonconvex. The removal of the convexity assumption is of particular importance when deriving ELI type conditions. We illustrate this feature by deriving necessary conditions for problems that in addition to state constraints incorporate mixed state-control constraints.