1059-49-146 **Behzad Djafari Rouhani** (behzad@utep.edu), Mathematical Sciences Department, University of Texas at El Paso, 500 W. University Ave., El Paso, TX 79968, and **Rasoul Azizi*** (razizi@miners.utep.edu), Mathematical Sciences Department, University of Texas at El Paso, 500 W. University Ave., El Paso, TX 79968. *A numerical method for an elliptic optimal control problem.*

We consider the following optimal control problem governed by an elliptic variational inequality:
$minimize\ J(u,y) = \frac{1}{2}\left\|y - y_d\right\|_H + \frac{\beta}{2}\left\|u\right\|_U$
subject to:
$(Ay - Bu - f,\, z - y) \geq 0\,;\, \forall\, z \in X\,,$
$u \in U\,,\, y \leq \psi\,,\, \psi \in H\,,$
$X = H_0^1(\Omega)\,,\; U = H = L^2(\Omega)$
Where β is a positive constant, y_d is an element of H, and f is in X^*. A is an operator from X to X^*, and B is a compact operator from U toX^*. This problem was considered by K. Ito and K. Kunisch. They showed that the Lagrange multiplier method guarantees the existence of a solution for the optimization problem. Often, these kinds of optimization problems are ill-posed, and we use regularization methods to approximate the solution. They derived necessary and sufficient conditions for the existence of a solution to the regularized problem. Here we extend the Ito and Kunisch's numerical results by analyzing the active-set algorithm they introduced, whose efficiency depends on the strict complementarity condition, and by investigating the convergence of the algorithm either with or without the strict complementarity condition. (Received February 24, 2010)