

## **Differential game of pursuit time satisfy the geometric constraints in $l_2$ space**

### **ABSTRACT**

In the present article, we present a differential game of pursuit problem with the case of geometric constraint in the Hilbert space  $l_2$ . The game is given by system of 2-infinite systems of first order ordinary differential equations (ODEs). Geometric constraint are imposed on the control functions of players. The game is began from a given point  $z_0$  called the initial position. It is given another point  $z_1$  in the space  $l_2$ . The Pursuer targeting to bring the state of the system from  $z_0$  to  $z_1$  where an equation to find a guaranteed pursuit time is obtained while that of the Evader action is opposite. The game is assumed to be completed if  $z(t) = z_1$  at some time  $t$ . Moreover, a control problem is studied and then extended to the differential game of pursuit where the strategy for the Pursuer is constructed explicitly.