Problem statement

In many differential game problems (especially in the plane), we are able to define a tested function:

$$\varphi(\,\cdot\,) : \Omega \to [0, \infty], \quad \Omega \subseteq R^n.$$

How to prove that the function gives the value of the game for the points from Ω without constructing the optimal positional strategies of the players?

Let us consider an example of time-optimal differential game, for which a tested function was constructed in the following works:

- **V.S.Patsko** A model example of a game problem of pursuit with uncomplete information. I, II. In: Differential equations (1971, 1972, in Russian)

- **M.Yu.Filimonov** Conjugation of singular lines in a differential game. In: Collection of articles (1985, in Russian)

- **Leitmann G.** The calculus of variations and optimal control. An introduction. New York etc.: Plenum Press, 1981.