

METHOD FOR PLANNING OPTIMAL PATH HAVING MINIMUM TARGET POSITIONING ERROR OF WATER SURFACE AUTONOMOUS VEHICLE

Abstract

The present invention proposes an optimal path planning method for water surface autonomous vehicle with minimum target positioning error, Including: S1, constructing a system model of water surface autonomous vehicle including motion model and observation model; S2, deriving the optimal geometric relationship between the water surface autonomous vehicle and its relative target; S3, obtaining prior position information of target for one or two water surface autonomous vehicles through gridded area method, or for three water surface autonomous vehicle through positioning technologies; S4, using Monte Carlo strategy to particleize nonlinear non Gaussian ranging noise and construct closed-loop expression of objective function; S5, combining the nonlinear dynamic programming algorithm to solve the objective function to obtain the optimal path. The advantages of this method are as follows: solve the problem of optimal path planning for surface vessels when the prior information of the target position is unknown and there are nonlinear non-Gaussian noises present, making it impossible to obtain a closed-form expression for the objective function, thus resulting in the inability to solve for the minimum localization error.

[Fig.1]