

2-D TERCOM Guidance-Neural Net Approach

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Abstract

The principal of terrain contour matching (TERCOM) technique is to measure the present altitude and compare it with the geographical reference altitude of the vehicle. Accordingly, with maximum correlation computation, it can estimate the present position and correct the guidance error of flight vehicle. TERCOM is an important and a crucial technique using in today's cruise missile or some special vehicle. However, it always be criticized for its enormous computation time. This paper proposes a new strategy for the TERCOM guidance of flight vehicle by Adline neural network. From practical digital map experiment test, it shows the proposed strategy has following benefits: (1) the new TERCOM guidance can adapt the geographical changing of the environment, (2) TERCOM guidance parameters can be constructed by neural network training, which reduces the computation time and saves memory space greatly, (3) the system has the property that tolerates measurement error. even the system exists some defects or the input information is deformed, (4) the translation and rotation problem in TERCOM can be solved easily, (5) the system can still be successful used in new environment after some finite training period, (6) By adding extra skill of classification, the time-consuming problem happened in large training samples can be improved also. The simulation and practical experiment shows its effectiveness and extensively.

Keyword : Terrain contour matching, Adaptive neural network, Inertial guidance system.