An Optimal fuzzy logic guidance (OFLG) law for a surface to air homing missile is introduced. The introduced approach is based on the well-known proportional navigation guidance (PNG) law. Particle Swarm Optimization (PSO) is used to optimize the of the membership functions' (MFs) parameters of the proposed design. The distribution of the MFs is obtained by minimizing a nonlinear constrained multi-objective optimization problem where; control effort and miss distance are treated as competing objectives. The performance of the introduced guidance law is compared with classical fuzzy logic guidance (FLG) law as well as PNG one. The simulation results show that OFLG performs better than other guidance laws. Moreover, the introduced design is shown to perform well with the existence of noisy measurements.

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