Underwater multiple target tracking decision making based on an analytic network process(PDF)

Title:	Underwater multiple target tracking decision making based on an analytic network process

作者：　王汝夯; 黄建国; 张群飞

Author(s):　WANG Ru-hang*; HUANG Jian-guo and ZHANG Qun-fei

College of Marine Engineering, Northwestern Polytechnical University, Xi'an 710072, China

关键词：　analytic network process (ANP); underwater multi-target tracking; decision; tracking logic

分类号：　-

DOI：　-

摘要：　Underwater multi-target tracking logic and decision (UMTLD) has difficulty resolving multi-target tracking problems for underwater vehicles. Present methods assume factors in UMTLD are uncorrelated, when these are actually in a complex, interdependent relationship. To provide this, an index set of multi-target tracking decision characteristics and an analytic network process (ANP) model of the UMTLD method was established. This method brings the index set of multi-target tracking decision into the ANP model, and the optimization multitarket tracking decision is achieved via computation of the resulting supermatrix. The rationality and robustness of decision results increase in simulations by 13% and 47% respectively with analytic hierarchy process (AHP). These results indicate that the ANP method should be the preferred method when UMTLD factors are interdependent.

参考文献/REFERENCES

[1] FENG Lu, GAO Xiaoguang. An application of analytic hierarchy process to the multi-target attacking decision[J]. Journal of Northwestern Polytechnical University, 1999, 17(4): 515-519. [2] WANG Baihe, HUANG Jianguo, ZHANG Qunfei. Underwater multi-target threat evaluation model based on analytic hierarchy process[J]. Ships Science and Technology, 2006, 28(6): 75-77. [3] CHEN Yongjiang, HUO Junxiu, WANG Jiansheng. The application of gray system theory to target compositor[J]. Journal of the Academy of Equipment Command & Technology, 2002, 13(3): 96-98.

[4] QIAN Jiang, XU Jianghu. Threat sequencing for aerial target based on BP neural network[J]. Modern Defence Technology, 2001, 29(6): 56-58. [5] SAATY T L. Decision making with dependence and feedback[M]. Pittsburgh: RWS Publications, 1996.

[6] CHENG Eddie W L, LI Heng. Application of ANP in process models: an example of strategic partnering[J]. Building and Environment, 2007, 42(1): 278-287.

[7] SUN Hongcai, TIAN Ping. Analytic network process (ANP) and scientific decision in decision science theory and method[M]. Beijing: Ocean Press, 2001: 3-8.

[8] IHSAN Yuksel, METIN Dagdeviren. Using the analytic network process (ANP) in a SWOT analysis—A case study for a textile firm[J]. Information Sciences, 2007, 177(16): 3364-3382.

[9] WANG Lianfen. The theory and algorithm of analytic network process[J]. System Engineering Theory and Practice, 2001, 3: 44-50.

[10] SUN Hongcai, Xu Guanyao, Tian Ping. Design alternatives evaluation of emergency bridge by applying analytic network process (ANP)[J]. System Engineering Theory and Practice, 2007, 27(3): 63-70.

备注/Memo: -