

机载光电系统目标威胁估计的模糊贝叶斯网络方法

作者：史志富, 郭曜华

单位：第二炮兵工程学院

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摘要：

针对机载光电传感器系统所提供的目标特征信息，提出利用模糊贝叶斯网络理论建立目标威胁估计模型来辅助决策者进行威胁判断。模型首先研究了机载光电传感器所能提供的目标特征及其对威胁程度的影响；然后选取合适的特征值并利用模糊理论方法对其进行模糊划分，从而建立了目标威胁估计的模糊贝叶斯网络模型，最后通过贝叶斯网络推理算法获得目标的威胁程度判断，为决策者进行决策提供技术依据。通过对整个威胁估计过程的仿真模拟验证了该模型的有效性和模拟结果的可靠性。

关键词：机载光电系统；威胁估计；贝叶斯网络；模糊理论

Target Threat Assessment of Aerial Optical-electronic System Based on Fuzzy Bayesian Network Model

Author's Name:

Institution:

Abstract:

Aim at the target characters information of aerial optical-electronic sensors system, the fuzzy Bayesian network model was brought out for threat assessment to assist the decision maker. Firstly, the method studies on the target characters and the influence on threat degree of aerial optical-electronic sensors' information in detail. Secondly, the appropriate characters are selected and the crisp variables are fuzzed by fuzzy theory. Then the fuzzy Bayesian network model of target threat assessment is established accordingly. Lastly, these are fed into fuzzy Bayesian networks that perform inference via belief propagation for threat assessment. The inference results can provide decision-maker with technique foundation. A simulation example of the whole threat assessment process demonstrates the validity of the model and the reliability of the inference results.

Keywords: threat estimation, aerial optical-electronic system, fuzzy theory, Bayesian networks

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