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可靠性

基于Bayes信息融合的人为差错概率计算方法

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摘要：

研究了人为差错概率的计算。首先，介绍了可用于人为差错概率计算的数据来源，主要包括：通用数据、专家数据、仿真实验数据和现场数据。然后，分析了Bayes信息融合方法的基本思想，强调了该方法的两个关键性问题：验前分布的构建和融合权重的确定。最后，构建了基于Bayes信息融合的人为差错概率计算方法。将前3种数据作为验前信息，融合形成验前分布。使用Bayes方法完成与现场数据的数据综合，得到人为差错概率的验后分布。基于该验后分布，完成人为差错概率的计算。通过示例分析，演示了方法的使用过程，证明了方法的有效性。

关键词： 人为差错概率 Bayes信息融合 人因可靠性分析 人的差错率预测方法 认知可靠性与差错分析方法

Human error probability quantification method based on Bayesian information fusion

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Abstract:

The quantification of human error probability is researched. Firstly, the data resources that can be used in the quantification of human error probability are introduced, including general data, expert data, simulation data, and spot data. Their characteristics are analyzed. Secondly, the basic idea of Bayesian information fusing is analyzed. Two key problems are emphasized, which are the formation of prior distributions and the determination of fusing weights. Finally, the new method is presented, which quantifies the human error probability based on Bayesian information fusing. The first three kinds of data are regarded as prior information to form the fused prior distribution. The Bayesian method is used to synthesize all the data and get the posterior distribution. Based on the posterior distribution, the human error probability can be quantified. An example is analyzed, which shows the process of the method and proves its validity.

Keywords: human error probability Bayesian information fusing human reliability analysis technique for human error rate prediction (THERP) cognitive reliability and error analysis method (CREAM)

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