工程与应用

概率粗糙集模型在机械故障诊断中的应用

王前震，蔡瑞英

南京工业大学 信息科学与工程学院，南京 210009

摘要　　机械故障产生的机理比较多且表现形式具有不确定性，概率粗糙集模型弥补了Pawlak粗糙集模型在解决知识不确定性决策问题时的不足。概率粗糙集模型能充分利用近似边界区域提供的统计信息，并能对给定概念一个更完整的刻画，因而可以提取带有确定因子的决策规则。首先论述了概率粗糙集模型并引进了概率粗糙集模型的属性约简，然后介绍了在机械故障诊断中有关Bayes决策问题的概率粗糙集模型，最后用一个实例说明概率粗糙集模型在机械故障诊断中的应用。

Application of probabilistic rough set models to mechanical fault diagnosis

WANG Qian-zhen，CAI Rui-ying

College of Information Science and Engineering，Nanjing University of Technology，Nanjing 210009，China

Abstract

In engineering application，for different reasons and various forms，mechanical fault diagnosis does not achieve desirable results.Probabilistic rough set model overcomes the lack of Pawlak rough set model in decision making under uncertainty knowledge.The model can make full use of statistical information around boundaries and give a completed description to given concepts，therefore it can extract decision-making rules with confirmed factors.The paper first explains probabilistic rough set model and introduces attribute reduction of the model，then describes probabilistic rough set model in the mechanical fault diagnosis application，which is about Bayes decision problem.Finally，the instance validates the feasible application of probabilistic rough set in mechanical fault diagnosis.

通讯作者　王前震 wangqz_2005@163.com