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# A machine learning bayesian network for refrigerant charge faults of variable refrigerant flow air conditioning system

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## Highlights

- Bayesian belief network(BBN) is introduced in fault diagnosis process of variable refrigerant flow(VRF) air conditioning system.
- Two typical faults, i.e. refrigerant leakage and refrigerant overcharge, were studied and performance data were used to evaluate this diagnosis network.
- During diagnosis procedure, the order of input evidences has an effect on the diagnosis efficiency.
- Apart from physical data of basic components, the conditions of other parts, such as compressor engine and accumulator, should be taken into consideration when diagnosing faults.

**Abstract:** An intelligent fault diagnosis network for variable refrigerant flow air conditioning system is proposed in this study. The network is developed under the foundation of bayesian belief network theory, which comprises two main elements: the structure and parameters. The structure obtained by machine learning and experts' experiences illustrates the relationships among faults and physical

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