Gas Turbine Prognostics using Fuzzy Systems and Modified Bat Algorithm

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Abstract

Gas turbines are used in many areas as primary drives. Their critical nature to the adjacent systems often made them a priority in terms of maintenance planning. This paper proposes the use of fuzzy systems and bat algorithm to predict remaining useful life of gas turbines. Construction of the model and a method for model confidence interval calculations are outlined. The proposed approach has general nature and can be applied to any system. In the present work, it is tested by considering a turbofan engine having low pressure and high pressure compressors. As it turned out, the proposed method has performed well even though the provided data were noisy. The results are applicable for early planning of maintenance schedules.

Keywords

Gas Turbine, Prognostics, Fuzzy Systems, Bat Algorithm, Remaining Useful Life