

عنوان مقاله:

Data mining for decision making in engineering optimal design

محل انتشار:

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خلاصه مقاله:

Often in modeling the engineering optimization design problems, the value of objective function(s) is not clearly defined in terms of design variables. Instead it is obtained by some numerical analysis such as finite element structural analysis, fluid mechanics analysis, and thermodynamic analyses. Yet, the numerical analyses are considerably time consuming to obtain the final value of objective function(s). For the reason of reducing the number of analyses as few as possible, our methodology works as a supporting tool to the meta-models. The research in meta-modeling for multi-objective optimization are relatively young and there is still much research capacity to further explore. Here is shown that visualizing the problem on the basis of the randomly sampled geometrical big-data of computer aided design (CAD) and computer aided engineering (CAE) simulation results, combined with utilizing classification tool of data mining could be effective as a supporting system to the available meta-modeling approaches. To evaluate the effectiveness of the proposed method, a case study in 3D wing optimal design is proposed. Discussion focusing on how effective the proposed methodology could be in further practical engineering design problems is presented.

کلمات کلیدی:

Data Mining, classification, Multi-objective Optimization, Engineering Optimization, Meta-Modeling

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