

# **The consideration of surrogate model accuracy in single-objective electromagnetic design optimization**

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## **Abstract**

The computational cost of evaluating the objective function in electromagnetic optimal design problems necessitates the use of cost-effective techniques. This paper describes how one popular technique, surrogate modelling, has been used in the single-objective optimization of electromagnetic devices. Three different types of surrogate model are considered, namely polynomial approximation, artificial neural networks and kriging. The importance of considering surrogate model accuracy is emphasised, and techniques used to improve accuracy for each type of model are discussed. Developments in this area outside the field of electromagnetic design optimization are also mentioned. It is concluded that surrogate model accuracy is an important factor which should be considered during an optimization search, and that developments have been made elsewhere in this area which are yet to be implemented in electromagnetic design optimization.