

# DESIGN OPTIMISATION OF ELECTROMAGNETIC DEVICES USING CONTINUUM DESIGN SENSITIVITY ANALYSIS COMBINED WITH COMERCIAL EM SOFTWARE

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## Abstract

This paper deals with two kinds of optimisation problems, relevant to the optimised source distribution and the shape optimum design, using Continuum Design Sensitivity Analysis (CDSA) in combination with standard electromagnetic (EM) software. Fast convergence and compatibility with existing EM software are the distinctive features of the proposed implementation. In order to verify the advantages and also to facilitate understanding of the method itself, two design optimisation problems have been tested: one is an MRI design problem related to finding an optimal permanent magnet distribution and the other is a pole shape design problem of a BLDC motor for reducing cogging torque, using both 2D and 3D models.