

## عنوان مقاله:

Optimum Shape Design of a Radiant Oven by the Conjugate Gradient Method and a Grid Regularization Approach

محل انتشار:

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## خلاصه مقاله:

This study presents an optimization problem for shape design of a 2-D radiant enclosure with transparent medium and gray-diffuse surfaces. The aim of the design problem is to find the optimumgeometry of a radiant enclosure from the knowledge of temperature and heat flux over some parts ofboundary surface, namely the design surface. The solution of radiative heat transfer is based on the net radiation method where the configuration factors are obtained by the Hottel's crossed-string approach by treating blockage and convex surfaces. The conjugate gradient method is used for minimization ofan objective function, which is expressed as the sum of square residuals between estimated and desired heat fluxes over the design surface, and the sensitivity coefficients are calculated by the finite difference method. A regularization approach is proposed to numerically regularize the ill-orderedgrids, which are commonly found during the iterative optimization process. Some example problems are presented to show the performance and accuracy of the method. The results show that the optimization procedure can successfully generate the optimum geometry of radiant enclosure

## کلمات کلیدی:

Inverse Geometry Design, Radiation, Optimization

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