

## **A fin design problem in determining the optimum shape of non-fourier spine and longitudinal fins**

Cheng-Hung Huang<sup>1,2</sup>, Hsin-Hsien Wu<sup>1</sup>

### **Summary**

The conjugate gradient method (CGM) is applied in an inverse fin design problem in estimating the optimum shapes for the non-Fourier spine and longitudinal fins based on the desired fin efficiency and fin volume at the specified time. One of the advantages in using CGM in the inverse design problem lies in that it can handle problems having a huge number of design parameters easily and converges very fast.

The validity of using CGM in solving the present inverse design problem is justified by performing the numerical experiments. Several test cases involving different design fin efficiency, design fin volume, specified time and relaxation time are considered and examined. Results show that CGM can be utilized successfully in determining the optimum shape of the non-Fourier spine and longitudinal fins.

---

<sup>1</sup>Department of Systems and Naval Mechatronic Engineering, National Cheng Kung University, Tainan, Taiwan 701, R.O.C.

<sup>2</sup>Corresponding author. Email: chhuang@mail.ncku.edu.tw

