

**assoc. prof. Jaroslav Mlýnek**  
**Department of Mathematics and Didactics of Mathematics**  
**Technical University of Liberec, Czech Republic**

## **Optimization of the temperature field on the mould surface**

The lecture will be focused on the problem of temperature optimization on the shell metal mould. Infrared heaters located above the mould surface heat the mould. This is one of possible ways of artificial leathers production in the automotive industry (e.g. the artificial leather on a car dashboard). The described mathematical model allows us to specify the locations of infrared heaters over the mould to obtain approximately the same heat radiation intensity across the whole outside mould surface. In this way we can obtain uniform material structure and colour shade across the whole surface of the artificial leather and thereby to prevent the scrap production. We used a differential evolution algorithm during the optimization process. The optimization procedure was programmed in the Matlab system and software package ANSYS was used for the subsequent temperature calculations. A practical example of optimization of heaters locations and calculation of the temperature across the mould surface will be shown.

This problem can be used for students as an application of mathematical methods in the production practice.