

# 國立中興大學

## 大數據中心 學術演講

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**講題：On the design of freeform reflectors for uniform illuminance by solving the Monge Ampere Equation**

**摘要：** The model of reflection and refraction free-form design problem is based on energy conservation and results in a fully nonlinear partial differential equation. The equation is the Monge-Ampere type PDE (MA) also arising in various research fields such as differential geometry, mass transportation, geostrophic fluid and optical design problem. For geometrical optical design, freeform reconstruction and design methods have been proposed by Minano, Benitez, Neubauer and Oliker, etc. Following Neubauer's idea and Parkyn's equi-flux map, we proposed a new design method for a single freeform reflective (or refractive) surface tailored to redistribute the radiant flux onto a prescribed illumination pattern. We first model a 2D skew freeform by a set of MA-type differential equations which formulate the ray tracing maps and illuminance redistribution. These equations are solved by using Feng and Neilan's vanished moment method. Finally, a 3D freeform reflector is constructed by using 2D skew freeform model and quadric surface fitting without optimization processing. Our method can be used for any geometric system, with no restriction on the desired target distribution, source intensity distribution, collective solid angle, or target topography.

**時間：2021/01/12（星期二）上午 11:10**

**地點：資訊科學大樓六樓（大數據中心）**

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