

國立中正大學數學系  
暨應用數學碩士班、統計科學碩士班  
學 術 演 講

**Neural networks for interface problems and  
evolutionary PDEs**

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**Abstract**

In this talk, I introduce neural network methods for solving partial differential equations (PDEs), with emphasis on problems involving non-smooth solutions, sharp spatial gradients, and rapid temporal variations. The main focus is on specialized architectures designed to resolve interface-induced irregularities, including the discontinuity-capturing shallow neural network (DCSNN), the cusp-capturing neural network (CuspNN), and categorical embedding-based physics-informed neural networks (CE-PINNs). These approaches incorporate problem-specific features, such as indicator functions and level set representations, to accurately capture jumps and derivative singularities. Their effectiveness and computational efficiency are demonstrated through representative numerical experiments. If time permits, I will give a brief discussion of extensions to evolutionary PDEs using time-dependent neural network formulations and present numerical comparisons to benchmark solutions.

**日 期：115 年 5 月 13 日(星期三) 16:10~17:00**

**地 點：本校數學館 527 教室（嘉義縣民雄鄉大學路 168 號）**

**茶 會：15:30~16:00 數學館四樓 409 室舉行**

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