

國立中山大學應用數學系

學術演講

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Brilliant Technology, Inc

講題：Some Applications of Scientific Computing to Engineering Problems

時間：2014/10/16 (星期四) 15:30 ~ 16:30

地點：理學院四樓理 SC 4009-1 室

茶會：15:00 於理 SC 4010 室 (系辦公室)

摘要

Scientific computing uses computational tools to solve scientific problems. Some example of scientific computing in engineering applications will be discussed. In recent years, the rapid advancement of modern computer technologies has made many novel computational approaches feasible. Many engineering problems should be revisited for the possibility of utilizing the latest scientific computing techniques to formulate new solution methods. In the case of structural engineering, Finite Element Analysis (FEA) has been studied and developed extensively with software packages available for many Civil, Mechanical, and Aerospace applications. The FEA method divides the problem domain into many small elements and converts the governing differential equations into a system of linear equations that can be assembled into a global equation consisting of matrices. Many available numerical tools can solve the equation of matrices. In this talk, a new approach will be presented. The new approach combines the data that can be measured by sensors distributed at key locations across the structural system with the prediction from the computational model. The solution process is formulated into an optimization problem to minimize the errors between the experimentally measured sensor data and the prediction calculated from the physical-based numerical model in the computer. Some results of the new mixed- numerical-experimental method will be presented. Possible further research, development, and application will also be discussed.

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