

"The Mathematics and Applications of a Sometimes Easy NP-hard Problem"

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10.00 – 11.00 Thursday, 20 May, 2010
Room M/0.40 Mathematics Institute
Cardiff University

Abstract

Since the development of the concepts of Computational Complexity, many papers have appeared in the OR literature describing the formulation of some practical real-world application as a mathematical optimisation problem. The papers briefly observe that the optimization model is in the class of NP-hard problems and therefore cannot be solved efficiently. They then proceed to introduce yet another heuristic or metaheuristic or even hyperheuristic as yet another "variation on a theme" to solve the practical problem without even attempting to solve the optimisation problem. In this talk I will discuss some real-world applications from the airline industry which give rise to "easy" NP-hard mathematical optimisation models. I will show that "easy" is related to the mathematical properties of balanced and perfect matrices which arise naturally from the real-world applications.

"Strategic and Tactical Issues in Health Care Delivery"

Professor William P. Pierskalla
Distinguished Professor Emeritus and Dean Emeritus
Decisions, Operations and Technology Management
The Anderson School at UCLA
Ronald A. Rosenfeld Professor Emeritus
The Wharton School
University of Pennsylvania

11.30 – 12.30 Thursday, 20 May, 2010
Room M/0.40 Mathematics Institute
Cardiff University

Abstract

Managing the quality and costs of health care services delivery is a challenge in every nation. Part of the challenge stems from the explosion of technological and knowledge processes. Part stems from the difficulty of trying to measure what, for many years, has been thought of as intangible outcomes. Part stems from the lack of consistent information and information systems. Part stems from the cultures of the country and the lack of physicians' interest in changing their behaviour. And part stems from the virtually unlimited demand for improved health. We will address current knowledge and research on these issues related to the quality and costs of care and will point out where Operations Research/Systems Engineering has, can, and will, make major impacts on the strategic and tactical issues in health care delivery.