THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

COLLEGE OF PROFESSIONAL AND CONTINUING EDUCATION
專業及持續教育學院

School of Professional Education and Executive Development
專業進修學院

SPEED

Research Centre for Advanced Design, Materials and Manufacturing Technologies (RCADMM) SEMINAR

DATE: 29 JUNE 2020 (MONDAY)
TIME: 2:30 pm – 4:00 pm
VENUE: ONLINE (MICROSOFT TEAMS)

The seminar is fully supported by a grant from the Research Grants Council of the HKSAR, China. (Project No.: UGC/IDS(R)24/19)

Registration!

Click Here

Professor Felix Chan
Associate Head and Professor,
Department of Industrial and System Engineering,
The Hong Kong Polytechinic University

Topic

Development of Artificial Intelligence embedded Aircraft Scheduling Decision Support System for Hangar Shop in Aircraft Maintenance Company

Abstract

Because of the rapid booming in aviation industry, the growing rate of commercial aircraft and private jet in the world are much faster than ever. For every aircraft, after landing, demand of maintenance service and checking for airworthiness is necessary before they are allowed to take off again. In general, these services and checking are taken place in Hangars which are managed by aircraft maintenance service providers located at the airports. However, due to the limited space in airports, the size of Hangar is usually small and regarded as one of the critical scarce resources. Accordingly, the main objective of this research is to optimize the space utilization of Hangar by placing more aircraft in, implying the maximization of revenues. Indeed, this problem is challenging due to the complexity of the problem considering special shapes of hangars, limited space, various dimensions of aircraft, frequent operations of moving in/out and so forth. The proposed model has taken into account all the practical and operational constraints, e.g. the direction of aircraft has to be placed. In this connection, this research proposed a novel Genetic Algorithm (GA) based approach to optimize the space utilization of Hanger. In addition, this research developed the first 2D geometry aircraft model consisting of seven parameters with a center line to define the central coordination of the aircraft. Based on this research, a novel GA for the aircraft placing problem is developed. Practical instances from an aircraft service company have been used to test the proposed methodology. The performance of the Hanger is significantly improved.

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SPEED

Dr. Udaya Kahangamage

Lecturer, Division of Science, Engineering and Health Studies,
School of Professional Education and Executive Development,
College of Professional and Continuing Education,
The Hong Kong Polytechnic University

Topic

3D-Printing of Bio-inspired Composites

Abstract

Nature has developed highly optimized high-performance materials and structures over millions of years' evolution. They provide valuable sources of inspiration for the design of next- generation advanced structural materials and structures. However, mimicking complicated structural architecture of natural systems to develop advanced materials/structures is somewhat limited due to limitations in traditional fabrication technologies. Recent developments in 3D-printing technologies and associated computer-aided design and analysis tools have created new opportunities for mimicking the complicated multiscale, multi-material and multi-functional structures in nature. This is a review of advanced material properties of some multifunctional biological materials and how the 3D-printing techniques can be used to mimic nature's designs to develop composite materials. Potential applications of such materials are also explored.

Dr. Zerance Ng

Associate Division Head and Senior Lecturer,
Division of Science, Engineering and Health Studies,
School of Professional Education and Executive Development,
College of Professional and Continuing Education,
The Hong Kong Polytechnic University

Topic

Sound Absorption Performance of 3D Spacer Fabrics in Composite Structures

Abstract

Porous materials have long been used for sound absorption in industry. The working principle is to allow sound waves to enter the material surface and attenuate the sound energy while penetrating through the internal structure of material. The sound absorption performance depends on some intrinsic physical properties and geometry of a sound absorber, such as density, porosity, tortuosity and material thickness etc. In this presentation, the sound absorption performance of 3D spacer fabrics in different composite structures will be discussed. The sound absorption coefficients of the composite structures at different sound frequencies are measured by the two-microphone Impedance Tube and Reverberation Room Method. Comparisons between the proposed composite structures and the common sound absorbers will also be presented.

All are welcome!

Please click here or scan the QR code for registration

For enquiry, please contact Ms. Jenny Li at jenny.li@speed-polyu.edu.hk on or before 24 June 2020.