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Bio-inspired multiscale composite materials and structures

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Abstract: This talk presents three aspects of our recent research on bio-inspired multiscale composite materials and structures: (a) inspired by the basic anchoring role of tree and plant roots, we grafted nano entities, such as carbon nanotubes, graphenes and nano particles, onto carbon fibre surface and assessed its mechanical, electrical and thermal behaviours, in particular in relation to enhancing the interfacial shear and peel strength in carbon fibre reinforced composite materials and structures; (b) computational simulations of multiscale materials covering topics on static and dynamic interactions amongst carbon nanotubes, graphenes and carbon fibres, for example, interaction between a graphene and a nano carbon nanotube under impact loading similar to a nano scale trampoline; and (c) optimum configured bi-/multi-stable materials and structures fabricated using 3D printing and its potential applications.

Biography

Dr Liyong Tong received his PhD in 1988 and became a full professor in the School of Aerospace, Mechanical and Mechatronic Engineering at the University of Sydney in 2004. His primary research interests consist of analysis, design and manufacturing of bio-inspired multiscale 3D composite and smart materials and structures with practical applications. His research was funded by government agencies and industries, e.g. ARC, AOARD/AFOSR, DSTO, Boeing, Airbus and Petronas. He authored and co-authored over 250 publications and has been collaborating with colleagues in America, Asia and Europe.

