Faculty of Engineering  
Summer Research Program 2019-2020  

Project Title: Nanotechnology-based smart window development for green building construction  

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Objective  
To investigate the potential of using 2D nanocomposites as energy saving components in green building industry  

Project Details  
As buildings account for a significant amount of energy consumption worldwide, the development of green buildings is essential to address the severe energy problem faced by the world. With the ability of intelligent control of the heat flux transmittance, smart window is one of the key technologies for green building construction towards sustainable development. However, the current technology development on smart windows suffers from problems in terms of scale, cost, performance and environmental issues, which hinders their applications in practices. This project aims to develop multifunctional smart windows by incorporating phase-changing vanadium oxide (VO₂) with 2D nanosheets of graphene and molybdenum or tungsten disulphate (MoS₂ or WS₂). This novel type of large-scale, cost-effective, non-toxic two-dimensional (2D) heterostructures can regulate thermal and light transmittance while harvest solar energy. The outcome of this project can facilitate great decrease of energy consumption and greenhouse gas emission in the building industry.  

Prerequisites  
NA  

Additional Information  
Applicants may be required to attend an interview