Recent R&D on sustainable energy: New AI wake models with vs full-rotor CFD predictions

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There is an urgent need to research and evaluate alternative renewable energies as there is a steady increase in energy consumption, fluctuating fuel costs, global climate changes and depletion of fossil fuels. The cluster of wind turbines called 'wind farm' is among the most promising alternative energy resources that have recently gained attention. There are numerous elements that determine the operation of the wind turbines in a large wind farm covering a great expanse of land (onshore) or water (offshore). The most significant and challenging study in the arrangement of wind turbines in the wind farm is its effect of wake interaction. Lately, there is rapid development in research and the implementation of artificial intelligence (AI) in diverse disciplines. The speaker team has derived an empirical relationship for wake velocity and turbulence intensity for a standalone turbine under uniform inflow and under different Atmospheric Boundary Layer (ABL) conditions for wake characteristics via numerical derivations. This talk presents the implementation of AI in wind farm analysis with better accuracy.

Biography

Ng obtained a B. Eng (CL I) from Uni. of Newcastle upon Tyne; Ph.D. at Cambridge Univ. with a Cambridge Commonwealth Scholarship; PG Diploma in Teaching Higher Edu., NIE-NTU. He is a Fellow of the American Society of Mechanical Engineers (FASME) and member for Academy of Pedagogy and Learning, USA. His expertise is in commercial and in-house developed software to perform numerical simulation in the biomedical engineering (BME), thermal-fluid and health-related diagnosis fields. He has been an editorial board member for 10 journals and reviewer for 30 journals. He was Editor-in-Chief for 2 ISI-journals which were captured by the JCR within 2-years of their inauguration. He is an expert research funding reviewer for many funding agencies worldwide. He has been recognized internationally for academic excellence. He received numerous best papers, service awards and has directly supervised 5 RFs, graduated 23 PhD and 26 Master students. He was awarded the SPRING-Singapore Merit Award for his work in thermal imagers to screen SARS fever as well as contributions to the Singapore Standardization Program. Being a co-inventor of 3 US patents on software classifiers to identify the different stages of breast cancer development in iTBra-system, he was accoladed with equity in a listed company. His ongoing work on non-contact screening for carotid artery stenosis and superficial vein-finder has resulted in 3 filing patents. He has notable citations in the field of infrared physics & technology in BME research.

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