Special Issue

Turbulence Modeling: Roadblocks, and the Potential for CFD-Driven Machine Learning

Message from the Guest Editor

Turbulence, with all its manifestations in industrial processes, e.g., combustion and energy production, in environmental pollution, in climate change, and in biological flows, is a vital field of science and engineering because of its multiple applications in society. Most of the modeling to date is based on the following principle: "All turbulence modelers **must** follow the Kolmogorov pattern, viz. by solving equations for **statistical averages** such as $k, \varepsilon,$ vorticity fluctuations, Reynolds stresses, etc." **This is an untruth**, although most modelers do believe it and modish variants such as **Large Eddy Simulation** (of which there are many) may create the **illusion** of novelty. Such models perform **badly** when body forces act differently on, say, hotter and colder elements in the turbulent mixture, as, e.g.*,* in forest fires. Fluid **population theory** is probably the best way forward. The purpose of this book is to investigate the above research matters but most importantly to illustrate the application of methods of Artificial Intelligence (for example, Artificial Neural Networks) to turbulence big data.

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Message from the Editor-in-Chief

As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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