

A New Direction of Engineering Simulation Driven by Data Assimilation

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The utilization of measurement data is becoming attractive in various fields due to the massive growth of sensing and networking technologies boosted by, so-called, the internet of things (IoT). It is expected to utilize such a data-rich environment to improve engineering simulations in computer-aided engineering (CAE). Data assimilation is one of the methodologies to statistically integrate a numerical model and measurement data, and it would be a key technology to take advantage of IoT technologies in CAE. Unlike meteorological/oceanographical data assimilation where the estimation of initial conditions for numerical weather prediction is of primary interest, engineering data assimilation, as it is called, data assimilation-aided engineering (DAE), should focus on other functionalities of data assimilation such as the improvement of a model by measured data and adaptive measurement based on model prediction. In this presentation, we describe examples of such data assimilation studies applied to engineering problems.

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