Neural Network as a New Method for Data Assimilation

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Data assimilation is an essential issue for all operational centers with focus on numerical weather prediction, hydrology, ocean circulation, environmental forecasting, space weather, and ionospheric dynamics. Several methods has been proposed for data assimilation based on Kalman filter, variational schemes, and particle filter. However, such strategies has very high computational effort. Our investigation is to apply a self-configuring supervised artificial neural network to address the data assimilation process, with significant reduction of the CPU-time. Results will be shown for different models: shallow water 2D for ocean circulation simulation, global spectral 3D meteorological models (SPEED, and COAPS-FSU), and a regional meteorological model (WRF-NCAR).