Machine Learning Strategy in Predicting CFD Simulation

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The application of machine learning concept in the field of Chemical Engineering is unclear due to the challenge of limited data for training. In this study, we explored a predictive model to the learning of CFD simulation data by modifying the architecture of a deep neural network. In addition, a 3D display of the unit was modeled using python with tensorflow and mayavi libraries. In optimizing our model, we used stochastic approach with other variable tuning and the technique of incorporating principal component analysis (PCA) based model into the network. We found that the PCA based model gave very accurate results and lower computational cost. Not only has this model given a very low error but has proved the feasibility of machine learning concept application to simulation. This is a worthy course to pursue due to the high computational cost and longer time it takes to get results in CFD simulations.