Automatic optimization experiment of the neural network radiation emulator using Sherpa

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In order to improve the accuracy of the numerical weather prediction model and reduce the computational speed, the radiation process is replaced with an artificial intelligence neural network emulator. For the best performance of the neural network emulator, optimal hyperparameters must be determined. Hyperparameters of neural network include learning rate, batch size, number of neurons, number of hidden layers, number of inputs/outputs, and number of epochs. A lot of experiment is done manually to find the conditions that yield the best results. To reduce this task and automatically determine the optimal hyperparameter, various method is provided. Sherpa is a Python library that automatically optimizes the hyperparameters of neural network. Results obtained using Sherpa were compared.

Key words: Sherpa, WRF, radiation, emulator, neural network