MMM SEMINAR SERIES

Replacing Current NWP with Deep Learning Weather Prediction and Extensions to a Full Earth-System Model

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We compare the performance of a global deep-learning weather-prediction (DLWP) model with reanalysis data and forecasts from the European Center for Medium Range Weather Forecasts (ECMWF). The model is trained using ECMWF ReAnalysis 5 (ERA5) data with convolutional neural networks (CNNs) on a HEALPix mesh using a loss function that minimizes forecast error over a single 24-hour period. The model predicts seven 2D shells of atmospheric data on an equal-area pixelization at resolutions of roughly 200 km Notably, our model can be iterated forward indefinitely to produce forecasts at 6-hour temporal resolution for any lead time. We present case studies showing the extent to which the model can reproduce the dynamical evolution of atmospheric systems and its ability to learn "model physics" to forecast two-meter temperature and precipitation. Extensions to a full earth-system model are also considered.

Thursday, 9 March 2023, 2:00pm

Refreshments 1:45pm

Please also join colleagues for refreshments and informal discussion after the seminar until 3:30pm

NCAR-Foothills Laboratory, 3450 Mitchell Lane

FL2-1022, Large Auditorium

Seminar will also be live webcast

https://operations.ucar.edu/live-mmm

Participants may ask questions during the seminar via Slido.