MMM SEMINAR SERIES

Towards Digital Twins of (3D Printed) Weather Stations for Gap Filling and Virtual Setup via AI/ML

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Artificial intelligence skillfully filled observational gaps in global temperature datasets dating back to 1850 (Kadow et al.2020). The refined datasets showed remarkable accuracy, with high Pearson correlation coefficients and minimal root mean square errors compared to the original records. This method outperforms traditional interpolation and infilling techniques, providing a more accurate reconstruction of historical climate patterns. In an extension of this work, we have applied the AI-driven gap-filling technique to address the problem of data discontinuities in 3D printed weather stations (3D-PAWS), which are often found in developing regions and rural areas plagued by poor maintenance and connectivity. Through the 3D-PAWS initiative, which promotes the local production of low-cost and reliable weather stations, the study aims to efficiently integrate these stations into observation networks. By training the AI model with ERA5 data, the project aims to create digital twins of these weather stations, effectively simulating their setup and filling in missing data, thereby improving the accuracy and reliability of meteorological observations at different global locations. This innovative approach holds great promise for improving climate monitoring and reducing weather-related risks through advanced AI applications. Here we present a first setup focusing on temperature time series from 3 example sites (Denver, Barbados, and Vienna) of the 3D PAWS network.

Thursday, 15 February 2024, 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.