Weather Machine Learning Platform (WxMLP)for Weather Applications at Scale

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Transitioning research machine learning models into an operational environment has proven itself to be difficult and leads to results that are not reproducible in the field. The Weather Machine Learning Platform, or WxMLP, provides tools and techniques that allows for rapid implementation and evaluation of new machine learning models, solving the challenge of developing ML models at scale and deploying them in a production environment. The platform takes users through the entire ML pipeline from data curation and exploration, to training and evaluating a model. WxMLP is currently deployed operationally within the Air Force Weather Enterprise Cloud and adheres to DoD cybersecurity standards, continually being scanned for any vulnerabilities. The platform supports several MLOps studies including the forecasting of aviation hazards such as turbulence and icing, as well as the global synthetic weather radar (GSWR) program. GSWR is a SOTA ML model that predicts synthetic radar for areas where we currently do not have data. The GSWR model is trained within the WxMLP environment and has been transitioned to an operational testbed for real time forecasting. The model is continually monitored for model drift and undergoes retraining within WxMLP in a defined timeframe.