Explainable Artificial Intelligence for Precipitation Forecasting

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Since extreme weather events can directly damage humans and the economy, weather forecasting requires conservative decision-making, and it is necessary to provide an explanation as to whether the results of model predictions are reliable. This study focuses on input attribution methods, which are designed to identify the relationship between input and predictions of AI models, and analyzes the challenges faced during their applications in AI-based weather forecasting systems: 1) a lack of ground truth for attribution results, 2) difficulties with specifying appropriate baselines for spatiotemporal data, 3) human interpretability of the attribution results. By illustrating these problems, we attempt to reinforce the need for input attribution methods that are tailored to the meteorological domain in order to improve trustworthiness of AI-based weather forecasting models.