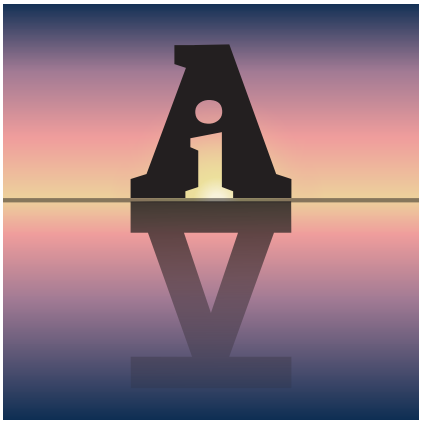

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Efficient Downscaling of Climate Models Using Deep Learning – **Matthew Weiss and Mark Veillette**

Poster Abstract

Global climate models, such as those available from the CMIP6 project datasets, are often generated at a low resolution due to computation constraints. This low resolution limits their application to areas where localized climate predictions are needed. One common method to increase this resolution is known as dynamic downscaling, where low-resolution climate forecasts are run through regional numerical weather forecasting models such as the Weather Research and Forecasting (WRF) model, to produce high-resolution results. Although dynamical downscaling is an effective and physically reliable way to increase resolution, models like the WRF are computationally expensive and require long run times, limiting the ability to perform dynamical downscaling on large datasets (e.g., CMIP6). In order to drastically speed up dynamical downscaling, we emulate the behavior of WRF using a deep neural network known as a generative adversarial network (GAN). Once trained, this emulator can downscale CMIP6 climate models in a fraction of the time compared with WRF-based downscaling.

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