



# Predicting Rainfall in California with Neural Networks

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- Droughts and flooding in California have profound economical and environmental impacts
- Predicting rainfall totals can help water managers mitigate the impact of extreme weather events
- Goal: Evaluate the viability of Convolutional Neural Nets in meteorology for performing this kind of prediction

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# Data

- 7th International Workshop on Climate Informatics Data Set
    - TS: temperature at the surface (K)
    - PSL: mean sea level pressure (Pa) (not Pumpkin Spice Lattes!)
    - TMQ: precipitable water (mm)
    - U\_500: west-east component of the wind at the 500 mb pressure level (m/s)
    - V\_500: south-north component of the wind at the 500 mb pressure level (m/s)
  - Spatial Location
    - Seasonal signals in spatial data may be hidden by local variability
    - Normalize the data based on the temporal mean and standard deviation at each grid point
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# Neural Nets

- Convolutional Neural Nets (CNNs)
    - Features take the form of values on a lat/lon grid (surface temperature, pressure, etc.)
    - Characteristics of CNNs that make them good for image processing can also make them suitable for this kind of data
  - Recurrent Neural Nets (RNNs)
    - Effective for analyzing time series data and forecasting
    - Could have a significant role to play
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