The four features most strongly correlated to surface albedo were GHI, DNI, Solar Zenith Angle, and Cloud Type. The first three components contribute to 71% of the total variance. Future work could explore how the features are related to each other and compare dimensionality reduction using an autoencoder to PCA.

Surface albedo describes the fraction of sunlight reflected by a surface using a value from zero to one. Surface albedo can fluctuate due to environmental conditions. This project explores the leveraging of artificial neural networks to predict surface albedo. Weather changes cause power fluctuations in PV arrays. Prediction of these changes can make PV arrays more efficient. Surface albedo is strongly correlated with irradiance and power. Weather changes cause power fluctuations in PV arrays. Prediction of these changes can make PV arrays more efficient. Surface albedo is strongly correlated with irradiance and power.

**EXPERIMENTAL METHODS**
- Pre-process NSRDB data (standardization, one-hot encoding, train/test split).
- Determine how many layers and nodes are optimal for neural network.
- Train MLPRegressor to perform surface albedo prediction.
- Evaluate RMSE with varying learning rates, activation functions, solvers, and batch sizes.

**EXPERIMENTAL RESULTS**
- The four features most strongly correlated to surface albedo were GHI, DNI, Solar Zenith Angle, and Cloud Type.
- The first three components contribute to 71% of the total variance.
- Future work could explore how the features are related to each other and compare dimensionality reduction using an autoencoder to PCA.

**REFERENCES**

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