

## A comparison of regression algorithms for wind speed forecasting at Alexander Bay

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### ABSTRACT:

With the drive to reduce carbon emissions, the use of renewable energy such as wind power, solar power, hydropower and biofuel has become more prevalent globally. In the case of wind farms, the power generated by wind turbines is highly correlated to wind speed and direction. As a consequence, considerable research is currently being performed to accurately predict wind speed and direction ahead of time. In this paper the wind speed of South African data from the Wind Atlas of South Africa is used to forecast 1 to 24 hours ahead, in hourly intervals. Predictions are performed on a wind speed time series with three machine learning regression algorithms, namely support vector regression, ordinary least squares and Bayesian ridge regression. The resulting prediction errors from each method are compared to persistence forecast which serves as a performance benchmark. The results show a vast improvement on the persistence forecast and a slight improvement of the support vector regression over the ordinary least squares and Bayesian ridge regression. We also show that there is an additional improvement in prediction error when more features are added.