

# A new model for forecasting hourly solar radiation

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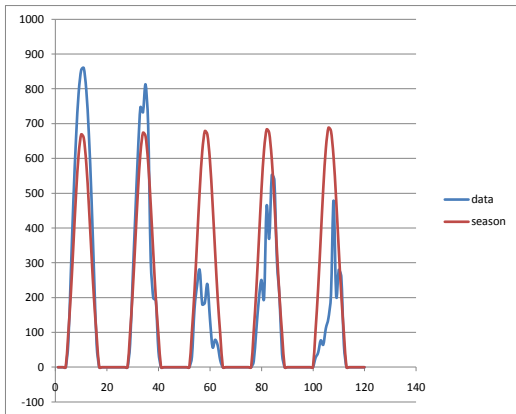
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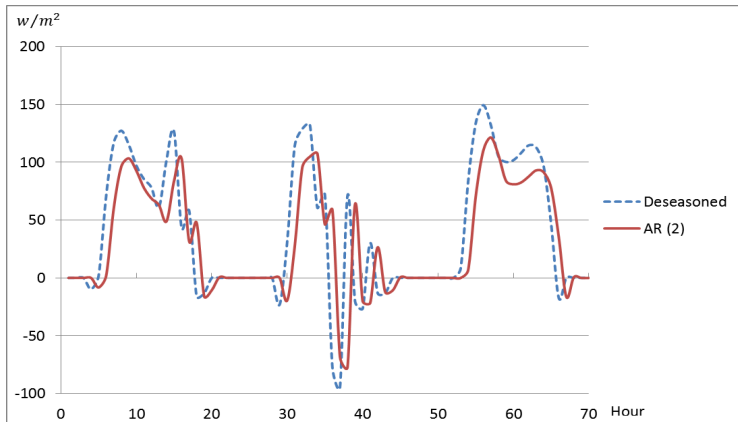
# Data

- The global solar radiation data we use in the development is from Mildura in South Australia during the year 2000. We have 8760 ( $24 \times 365$ ) hourly global radiation values in total.

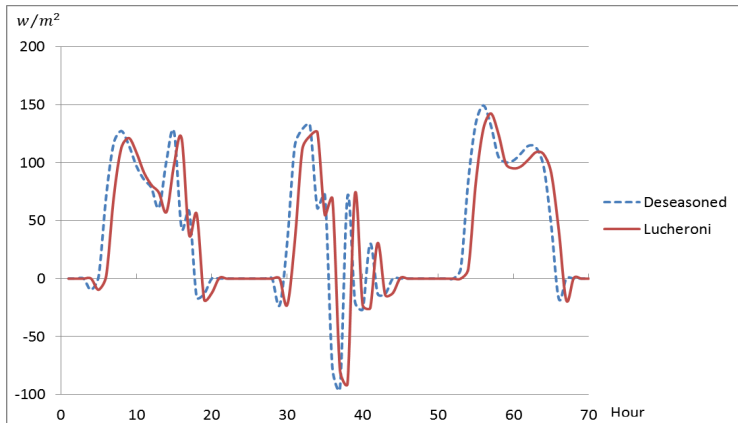
# Fourier series and Solar radiation data



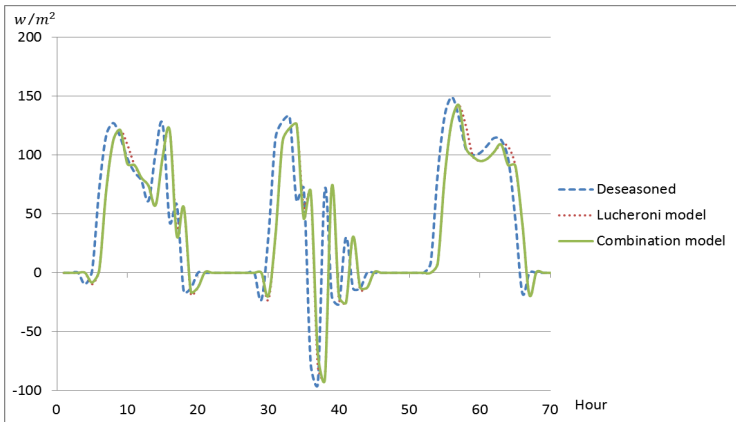
## For three days AR(2)



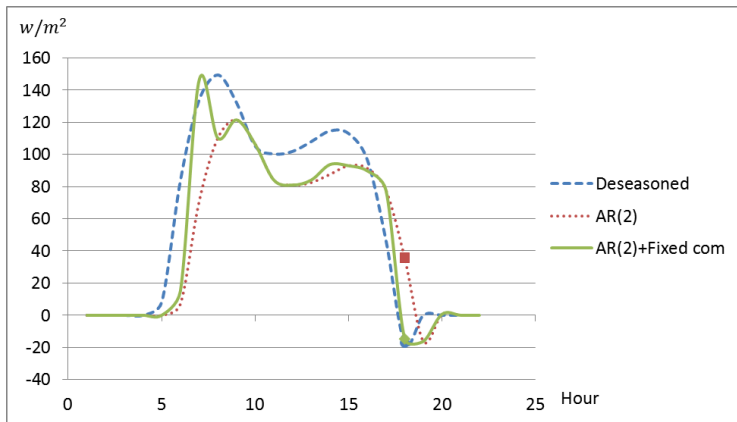
## For three days Lucheroni model



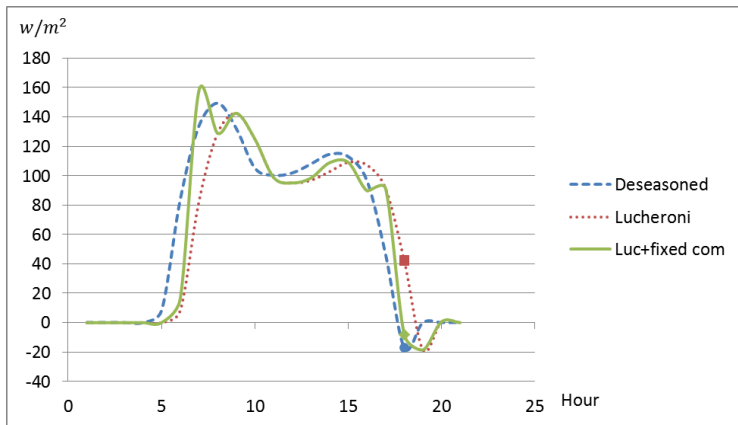
# The combination of AR(2) and Lucheroni



# when the fixed component replaces some of the predictions in the AR(2) model

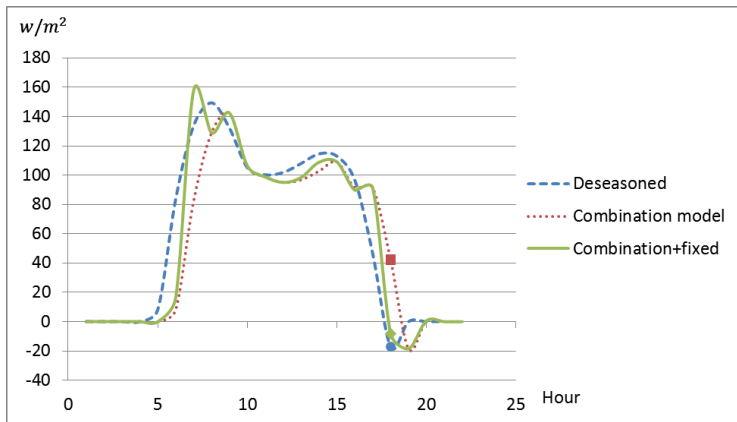


# when the fixed component replaces some of the predictions in the Lucheroni model

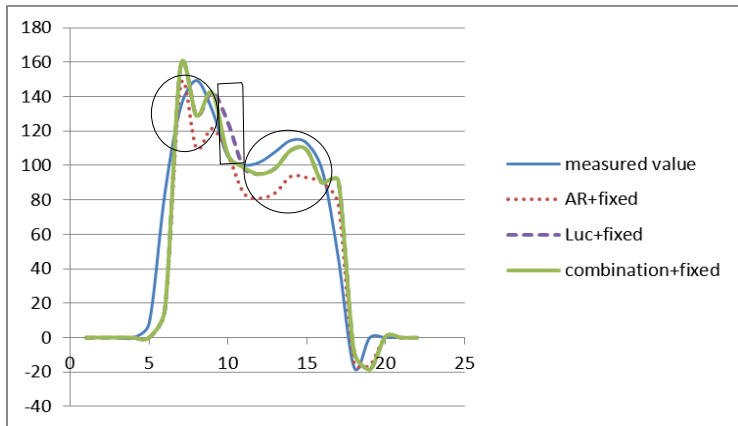




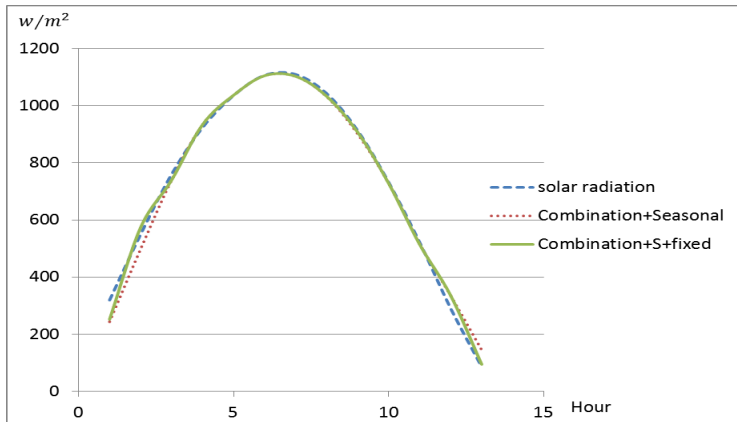
# when the fixed component replaces some of the predictions in the combination model



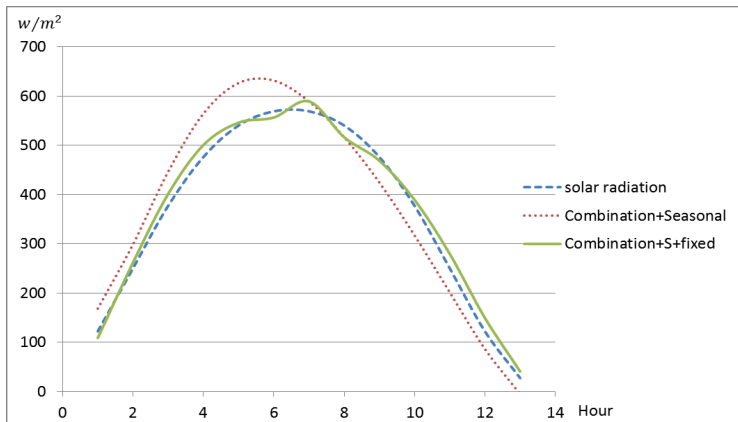
## Comparison of AR(2) model with fixed component and combination model with fixed component



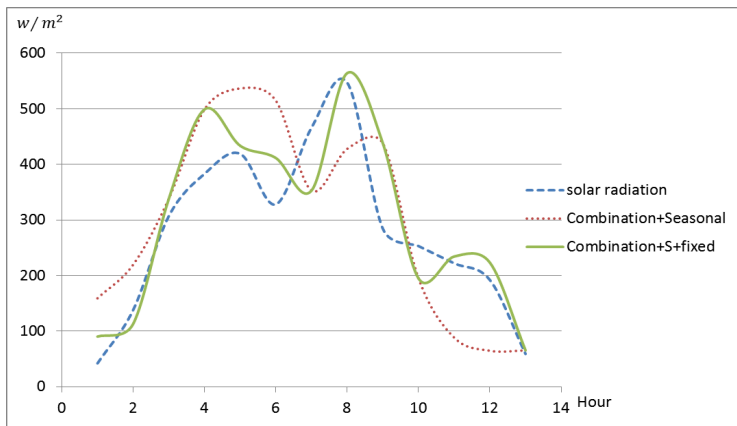
# First day, a very clear day on the 4th of January 2000, Mildura



Second day, an overcast day, but with no obvious clouds blocking the sun on the 24th of January 2000, Mildura



Third day, the following day, 25th of January 2000, which was an overcast day with clouds blocking the sun intermittently.



## Future work

- In the future, prediction accuracy of the proposed model can be further tested using global solar radiation data on different time scales and for different locations, as well as applied to other types of data, such as wind energy data.

- Thank you for your time.