Design of Relative Humidity Virtual Sensor in Northern Middle Java Province of Indonesia

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Relative humidity sensor is one of automatic weather station (AWS) component. Based on annual quality control, relative humidity sensor data have approximately 7% of unavailability because of system maintenance in 2020. This study proposes design of relative humidity virtual sensor according to competitive sensing concept. It is simulated on three AWS in northern Middle Java Province of Indonesia, namely AWS Kandeman, Pemalang and Kajen from January to March 2021. These AWS are installed adjacently around northern highway of Java in triangular constellation. Virtual sensor is arranged based on data fusions from physical sensors using MLP and LSTM algorithm. Three previous delayed temperature and relative humidity sensor data is utilized as inputs. Data are then segmented into 70% training and 30% testing data. Virtual relative humidity sensor for AWS Kajen is accurately composed by combination of delayed AWS Kandeman and Kajen data using MLP with 1.38 %RH of RMSE. Virtual relative humidity sensor for AWS Pemalang is accurately composed by combination of delayed AWS Kandeman and Pemalang data using MLP with 2.04 %RH of RMSE. Virtual relative humidity sensor for AWS Kandeman is accurately composed by combination of delayed all of those AWS data using MLP with 2.04 %RH of RMSE.

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Promotional text

We already discussed on deep research about virtual sensor in our institution, according to WIGOS program on WMO, we would like to share and improve our implementation in term of automatic weather station enhancement.

Oral preference format

in-person

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