

SURFACE TEMPERATURE ESTIMATION USING ARTIFICIAL NEURAL NETWORK

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ABSTRACT:

This research presents an alternative method to extrapolation land Surface Temperature (ST) through artificial neural network, using positional variables (UTM coordinates and altitude), temperature and air relative humidity. The study region was the Rio dos Sinos Hydrographic Basin (BHRS), in Rio Grande do Sul state, Brazil. For training the neural network was used a thermal image from NOAA satellite, with pixel size of 1X1 km, with known ST information referring to 12/06/2003. After training many network sets were done and one of them with the best performance and composed by a single intermediate layer (with 4 neurons and logistic sigmoid activation function) was selected. The training network was tested inside the BHRS where were collected 60 points of ST values supported by a portable laser sensor on date 3/18/2008. The average error provided by this model for ST measurement was 2.2°C and through executed statistical tests was possible to verify that not exist variation between average ST values accepted as true and the values provided by the neural model with a significance level of 5%.

TOPIC: Physical modeling and signatures

ALTERNATIVE TOPIC: Physical modeling and signatures