Automatic Spatial Prediction with General Regression Neural Network

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This work describes applications of General Regression Neural Network (GRNN) to spatial predictions. GRNN belongs to the class of neural networks widely used for the continuous function mapping. It is based on a non-parametric (kernel) Parzen-Rosenblatt density estimator. The kernel size is the only tuning parameter, and it allows to implement a GRNN in an automatic mode. An important advantage of the GRNN is very simple and fast training procedure. The most problem with GRNN is smoothing and dependence on the spatial density of the monitoring data set.

The direct estimation of the prediction uncertainty has some theoretical problems. Initially the method does not provide uncertainty, it is calculated under rather strong assumptions. Some ways to introduce the uncertainty are discussed in the work. One possibility is to provide a probability treatment of uncertainty.

The performance of the method is presented on both the synthetic and real data.