



T-s fuzzy systems for data interpolation on geophysical basis

A. Marullo, C. Saccà, C. Munafò, A. Teramo

Osservatorio Sismologico - Università di Messina

Most of data interpolation methods used by GIS are based on purely spatial informations. The usage of stochastic interpolators (based on Kriging methods and similar) allow the use of additional informations, but such inclusion results to be “opaque” due to the statistic nature of the methods itself. It’s hence proposed a new interpolation method for data of geophysical interest, based on the leverage of Takagi-Sugeno fuzzy systems. Such method allows the integration in the interpolation process of every additional informations concerning the interest area, thus realizing what can be defined a model based interpolation. Starting from a correlation model, binding known data, the fuzzy inferential engine interpolates measured data obtaining values based on the geophysical information about the study area. Comparative benchmarks proving the superiority of fuzzy methods against traditional methods about the interpolation of seismic data are shown. An additional advantage of such method results to be the natural integration of obtained information in decision support systems GIS extensions thanks to the usage of fuzzy integrals.