The Problems of Current Earth Coordinate System for Earthquake Forecasting Using Single Layer Hierarchical Graph Neuron

Authors : Benny Benyamin Nasution, Rahmat Widia Sembiring, Abdul Rahman Dalimunthe, Nursiah Mustari, Nisfan Bahri, Berta br Ginting, Riadil Akhir Lubis, Rita Tavip Megawati, Indri Dithisari

Abstract : The earth coordinate system is an important part of an attempt for earthquake forecasting, such as the one using Single Layer Hierarchical Graph Neuron (SLHGN). However, there are a number of problems that need to be worked out before the coordinate system can be utilized for the forecaster. One example of those is that SLHGN requires that the focused area of an earthquake must be constructed in a grid-like form. In fact, within the current earth coordinate system, the same longitude-difference would produce different distances. This can be observed at the distance on the Equator compared to distance at both poles. To deal with such a problem, a coordinate system has been developed, so that it can be used to support the ongoing earthquake forecasting using SLHGN. Two important issues have been developed in this system: 1) each location is not represented through two-value (longitude and latitude), but only a single value, 2) the conversion of the earth coordinate system to the x-y cartesian system requires no angular formulas, which is therefore fast. The accuracy and the performance have not been measured yet, since earthquake data is difficult to obtain. However, the characteristics of the SLHGN results show a very promising answer.

Keywords : hierarchical graph neuron, multidimensional hierarchical graph neuron, single layer hierarchical graph neuron, natural disaster forecasting, earthquake forecasting, earth coordinate system

Conference Title : ICGURDRR 2020 : International Conference on Geological Urban Risks and Disaster Risk Reduction

Conference Location : Amsterdam, Netherlands

Conference Dates : January 20-21, 2020