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EMV data analysis using Bayesian inference

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1 Abstract

Several Data Acquisition Systems are collecting Electromagnetic Variation (EMV) data in several geographic areas where seismic activities are frequently present. The analysis of the enormous quantity of data is a challenging task. Here is proposed a data analysis mechanism that can provide inference about seismic activity. Bayesian network (BN) is a statistical tool that can learn from previous events. Then by observing current data can give inference about related events. Given the EMVs in a geographical area, the BN can be used to compute the probability of the presence of seismic activity in this area.

Bayesian Networks are robust when there are missing input data. In this case, Bayesian networks will make the best possible inference by using whatever information is presented. This is possible because BNs encode the correlation between the input variables. The more information you supply to them, the more accurate the results will be. This is one of the main advantages over other data analysis representations like rule bases, decision trees and artificial neural networks; or over other data analysis techniques like regression, clustering, classification and density estimation.