An Algorithm of Improved Prediction from Existing Risk Predictions

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ABSTRACT

At the present stage, fundamental scientific research in hazard theory and risk is very important in order to be applied in practice to reduce real risks in industry, energy, transport, construction, agriculture. In terms of real risk reduction for earthquakes, volcanoes and tsunamis, as well as flood risk are still relevant. By the prediction task algorithm, we mean a sequence of actions directed to detect anomalous changes of the features or predictive events, and the name of one or more prediction results, the same prediction. Prediction - this is the development of a prediction, in the narrow sense, a special scientific study of the specific prospects for the further development of any process.

The first stage of the development of prediction tasks, like any research field, usually began with the accumulation of experimental data. Considering, for example, an earthquake prediction history, researchers first searched for one or more valid and reliable precursors, found causal linkages in earthquake preparation and implementation, and therefore accumulated empirical data, events that preceded a strong earthquake, and disappeared after an earthquake.

We believe that you cannot distinguish between dynamic and static predictions with the same static precursors. Let us call a static prediction process when the prediction result or results are to be identified, such as when, where and by what characteristics a predictive event will occur. Unlike the static prediction, we call dynamic prediction when prediction is necessary to predict some value at each time interval. During the static prediction, usually the data can be both static and dynamic, as well as during dynamic prediction. The static predictions can be distinguished: by time, by location, according to the characteristics.

Since the event does not happen very often, and the models often give a prediction that is not fulfilled, the value of the prediction justification is introduced. Our goal is to identify an algorithm that will allow us to increase the value of prediction justification. In this task we mean that the region is given or specified, the event location is predetermined, and we also assume that the entire budget allocated to the prediction process is predetermined.

Here we introduce the following algorithm: The event precursors for a predictive event were observed. At first, it is necessary to distinguish between these precursors the so-called "Necessary" precursors. We call the "necessary precursor" to the precursor if it predicted the event, that is, if the event occurred, then the vent was necessarily predicted by this precursor. From necessary precursors should be selected such pairs, triplets, etc. whose predictions coincidence number is minimum. As a result, the prediction is much improved, or the prediction justification value is increased.