ABSTRACT: NET-VISA is a probabilistic system developed for seismic network processing of data measured on the International Monitoring System (IMS) of the Comprehensive nuclear Test Ban Treaty Organization (CTBTO). NET-VISA is composed of a Generative Model (GM) and an Inference Algorithm (IA). The GM is an explicit mathematical description of the relationships between various factors in seismic network analysis. Some of the relationships inside the GM are deterministic and some are statistical. Statistical relationships are described by probability distributions, the exact parameters of which (such as mean and standard deviation) are found by training NET-VISA using recent data. The IA uses the GM to evaluate the probability of various events and associations, searching for the seismic bulletin which has the highest overall probability and is consistent with a given set of measured arrivals. An Interactive Model Visualization tool (IMV) has been developed which makes “peeking into” the GM simple and intuitive through a web-based interface. For example, it is now possible to access the probability distributions for attributes of events and arrivals such as the detection rate for each station for each of 14 phases. It also clarifies the assumptions and prior knowledge that are incorporated into NET-VISA’s event determination. When NET-VISA is retrained, the IMV will be a visual tool for quality control both as a means of testing that the training has been accomplished correctly and that the IMS network has not changed unexpectedly. The IMV is installed in the IDC development environment and currently available for testing.

The Event and Arrival buttons open menus which allow you to see all of the priors. Each window contains an image of the prior, a short explanation of what it means and how it is learned and a link to more documentation.

The arrival priors are grouped into three categories, associated arrivals, unassociated (or false) arrivals and coda arrivals.

The Science tab leads to detailed descriptions of the science and technology behind NET-VISA.

The Background tab teaches you how to use the website.

The References tab allows you to download NET-VISA documentation including tutorials and technical reports.

Send comments and questions to Hkuhma@chatelet-resources.com

Clicking on the Inference button gives you information about the inference algorithm.

Information about the program structure can be found in the References section.

Further documentation about every prior can be found by clicking on the More button.

Menus on the prior pages let you select and view the priors for quantities such as Event Detection and Associated Arrival Amplitude which are determined separately for every IMS station and seismic phase.

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