

# Novel Radionuclide Event Classification Method Based on CatBoost

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Four technologies are used for compliance verification of the comprehensive Nuclear-Test Ban Treaty (CTBT), hydroacoustic, infrasound, seismic and radionuclide monitoring. Forty radionuclide stations will have the radionuclide monitoring capability. For the last few years, a lot of research have been done in order to discriminate radionuclide derived from an explosion and anthropogenic sources. The explosion data are rare, for quite few nuclear test were done and little radionuclide was released from the underground. The civil facilities also emit mounts of radionuclide and the stations near those facilities will have a high radionuclide background. It is difficult to discriminate the background events and background plus explosion events. In this work, radionuclide monitoring data sets were modelled based on International Monitoring System xenon monitoring data over the past decade and the xenon ratios emitted by nuclear explosion. Dozens of features, including the four radionuclide concentrations, flags on xenon detected, xenon ratios, were analysed. We used CatBoost algorithm to establish a two classification model.

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## Promotional text

Radionuclide monitoring data sets were modelled based IMS xenon monitoring data over the past decade and the xenon ratios emitted by nuclear explosion. CatBoost algorithm is used to establish a two classification model based on dozens of features.

## Oral preference format

online live

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