



Geovariances individualizes geological and grade modeling to boost productivity and reduce ore/waste misclassification

CLIENT CASE STUDY

A top-ten iron producing company sought a solution to produce weekly resource models instead of monthly models to improve their decision process regarding the destination of the mined materials, this with minimized risk of time delay and people effort. Geovariances developed automated routines based on Isatis.neo batch and Python coding that have proven to do the job.

How to increase the frequency of model updates without spending much more time?

Resource models are highly dependent on the robustness of the geological models and grade estimates. Therefore, updating models with new data is essential to increase confidence in the outcomes. But updating models can be more time-consuming than desired, especially if it requires reparameterizing and relaunching calculations manually.

It is the kind of issue one of our clients is facing. This client updates its models every month using blast hole data and envisages doing it weekly so that the team can **make better decisions regarding the destination of the mined materials**. They asked Geovariances to investigate solutions that would allow them to send updated models to the production every week, quickly, **with minimized risk of delay and, most of all, no particular effort from the team on the mine** as they do not have much time to reanalyze and redo the whole modeling.

Geovariances proposed integrating automated routines into their process that use advanced geostatistics and machine learning techniques. These routines, combining batch scripts and Python codes, are then run from Isatis.neo, Geovariances' geostatistics software solution.

Geovariances submitted a first workflow tested and validated on one of their operations. **This workflow**

involves tools from Isatis.neo for diamond drill hole and blast hole data importing and quality control, and lithologies and grades estimation on a high-resolution block model. Python libraries and machine learning techniques are used for sample classification into given lithologies.

Based on batch and Python coding, automated routines allow producing models faster and more accurately.

The workflow was executed for a few weeks, and the new models were compared with the monthly models obtained with their current solution. Our client was satisfied to see that Geovariances' solution met their expectations. As a result, **the updated models can be delivered faster**, benefitting from the automation Isatis.neo batch procedures allow. They also found that **the models were more accurate**, which has been tested with production figures afterward.

The second demand was to make the mine team's experience as easy as possible. **Geovariances still used Python libraries to build an original and simple interface with the minimum necessary parameters to be populated.** A prototype was presented. It is part of the second phase of the project, which is now taking place. This new interface will be integrated into the built-in version of Isatis.neo, and then the user will be able to launch the whole workflow with a couple of mouse clicks.



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Batch and Python coding allow for a high degree of customization of Isatis.neo and simplified use.

"The combination between batch files and Python gives Isatis.neo tremendous capabilities and numerous advantages," says Gabriel Moreira, leader for mining projects at Geovariances Latin America.

"The routines are developed to suit the company's process and not the other way around."

It is not the company's process that should be shaped into a built-in software product, but the opposite, **which makes the workflow much more efficient.**

"There is no need for the team members at the mine to be advanced users of Isatis.neo."

They just have to open the dialog box built for them, fill in the few required parameters and click 'run.'

Lastly, the machine learning algorithms are built with the data the mine has collected for many years and then applied to the new data, reinforcing their robustness.



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