


## Exercise objective:

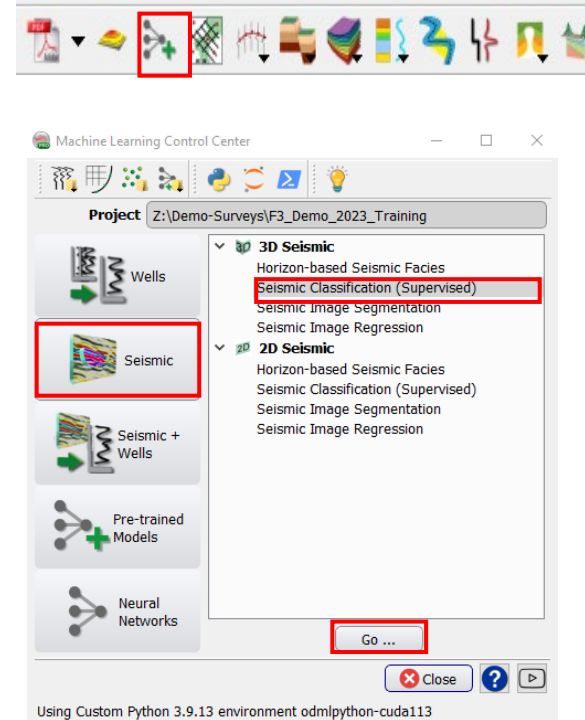
To predict seismic geo-bodies using the “*Seismic Classification (supervised 3D)*” tool which is part of the machine learning plugin. In this exercise, we want to predict Chimney location.

### Seismic data Preparation

**Seismic** need to be available in the survey. If not, **import** seismic, and interpret key seismic bodies locations (e.g. Chimney yes, Chimney no), or use existing trained model.

## Workflow:

1. **Open** the Machine Learning Control Center with the  icon.
2. **Click** on Seismic.
3. **Select** Seismic Classification (Supervised) under 3D Seismic, and **Hit** Go.



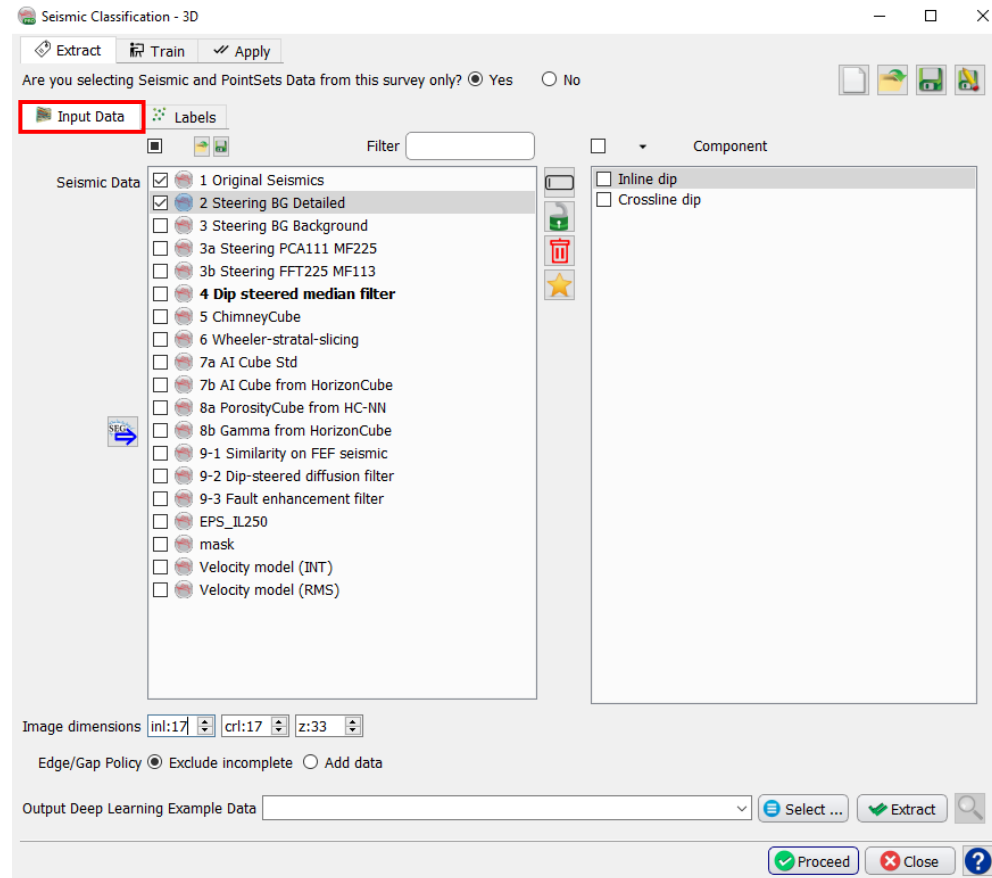
## Workflow cont'd:

4. The “*Seismic Classification*” window pops up.

5. **Select** *Input Data* in the “*Extract Data*” tab.


6. In the “*Seismic data field*,” **Select** the *Original seismic*, and “*2 Steering BG Detailed*” as an input

7. Use the default image dimensions



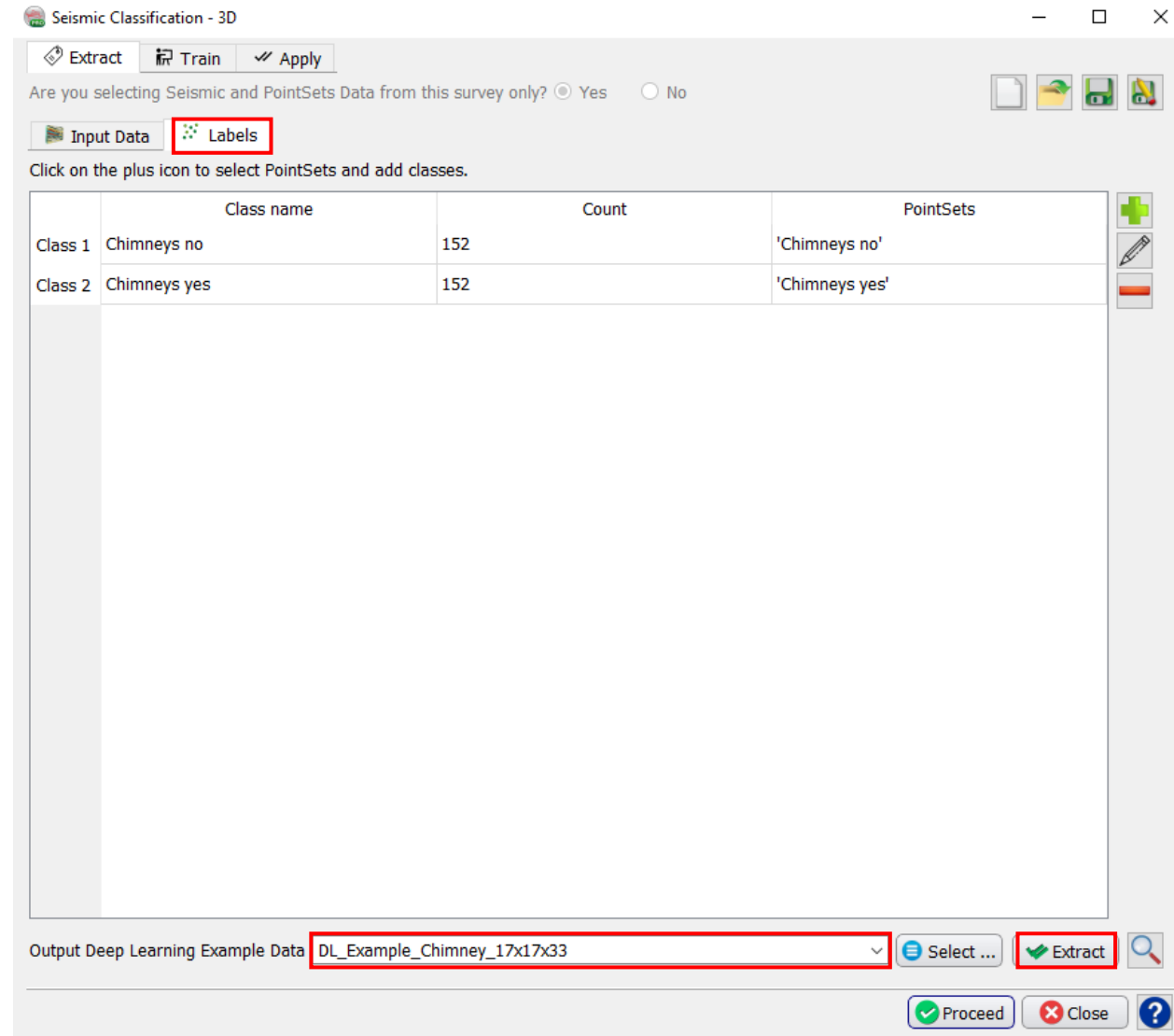
## Workflow cont'd:

8. **Click on** in Labels .

9. Click on add class  and select the first and the 2<sup>nd</sup> class example locations (e.g. Chimney yes, and chimney no).

10. Add a name for example data output and hit on

11. **Hit on** Extract






Seismic Classification - 3D

Extract Train Apply

Are you selecting Seismic and PointSets Data from this survey only?  Yes  No

Input Data **Labels**

Click on the plus icon to select PointSets and add classes.

	Class name	Count	PointSets	
Class 1	Chimneys no	152	'Chimneys no'	
Class 2	Chimneys yes	152	'Chimneys yes'	 

Output Deep Learning Example Data **DL\_Example\_Chimney\_17x17x33** Select ... **Extract**

Proceed Close ?

## Workflow cont'd:

12. Click on the Train tab

**Select** the example data.

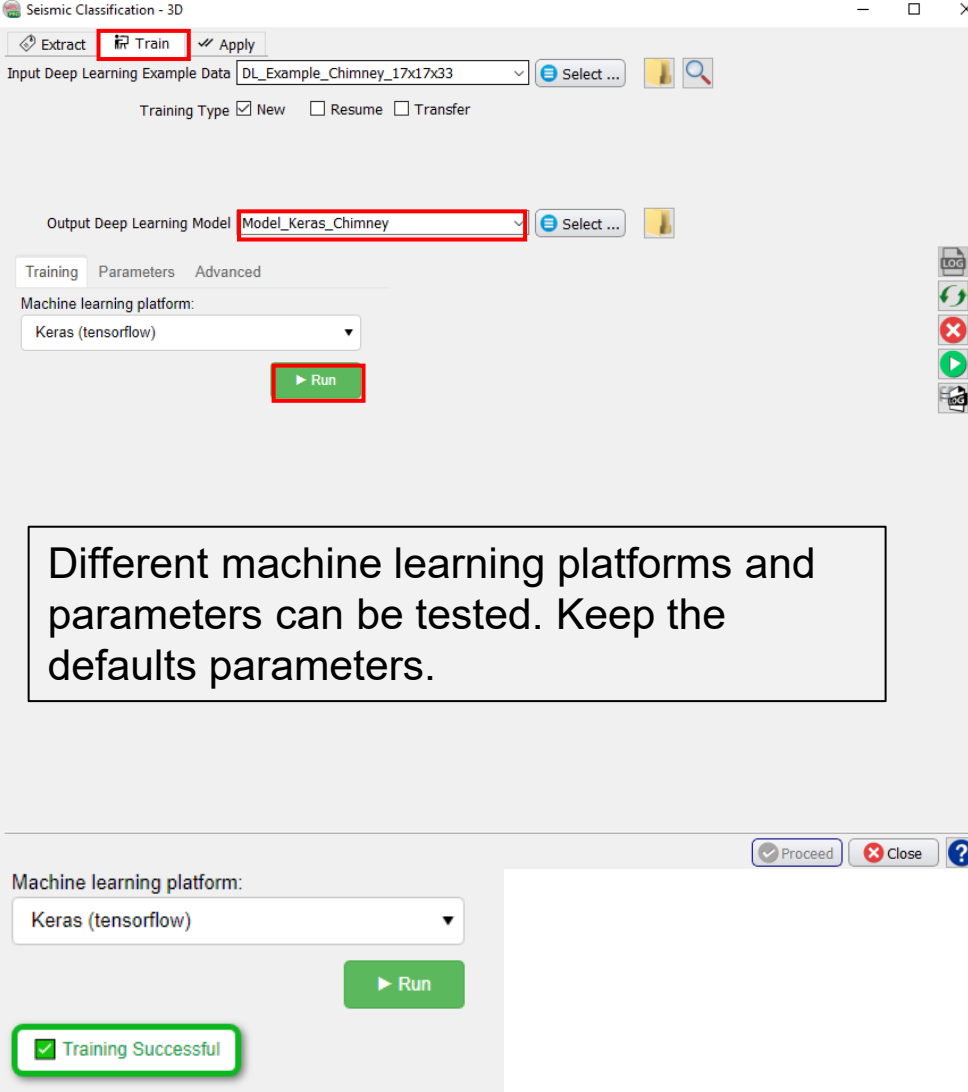
13. Toggle on New for the training type

14. Give a name to the output model

15. Select one of the learning algorithm (e.g. Keras-tensorflow) to train the extracted examples data.

16. **Press** on Run.

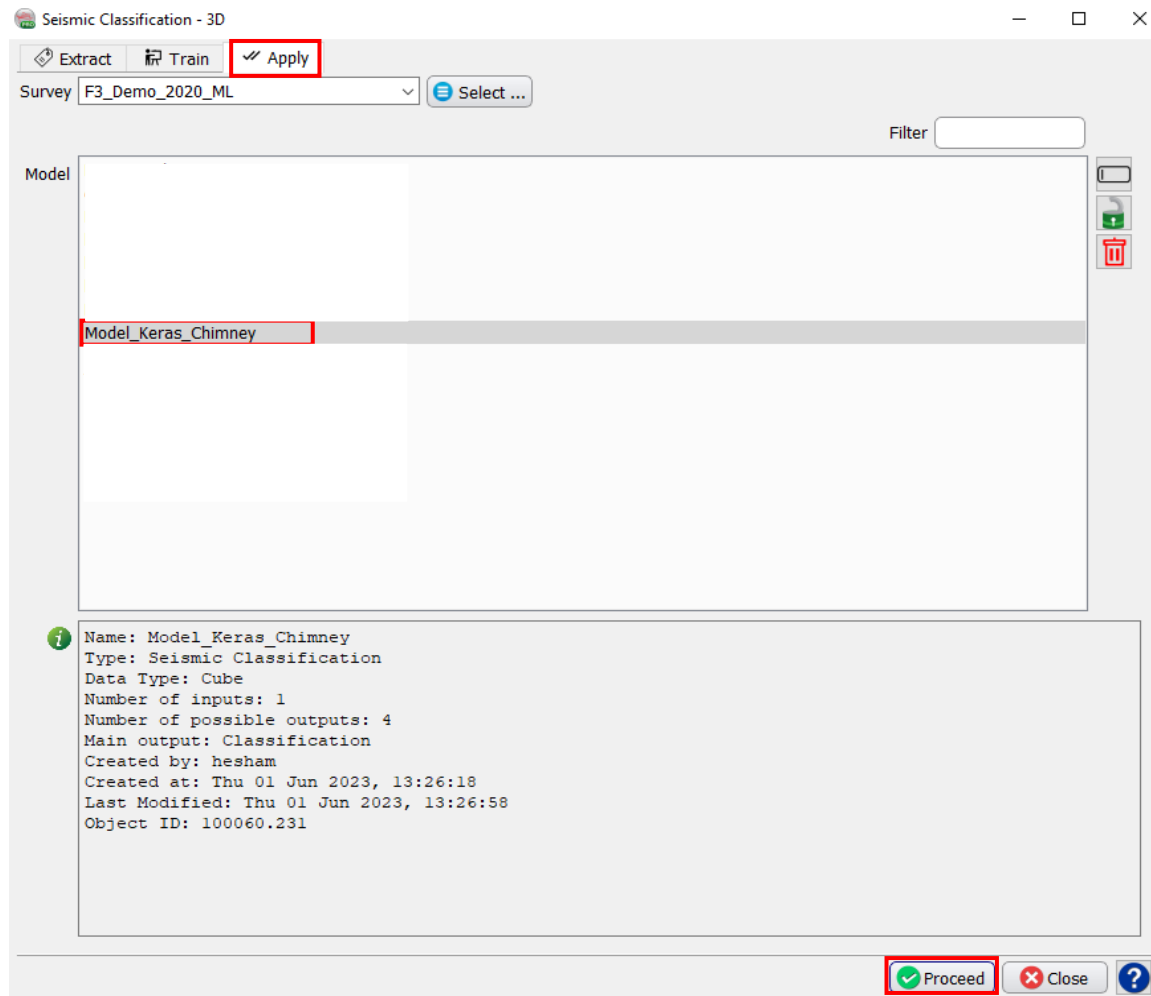
Wait till you see the training is complete and successful.



The screenshot shows the 'Seismic Classification - 3D' software interface. The 'Train' tab is selected and highlighted with a red box. The 'Input Deep Learning Example Data' dropdown is set to 'DL\_Example\_Chimney\_17x17x33'. The 'Training Type' is set to 'New'. The 'Output Deep Learning Model' dropdown is set to 'Model\_Keras\_Chimney'. The 'Machine learning platform' is set to 'Keras (tensorflow)'. A red box highlights the 'Run' button. A text box below the interface states: 'Different machine learning platforms and parameters can be tested. Keep the defaults parameters.' At the bottom, a green box indicates 'Training Successful'.

## Workflow cont'd:

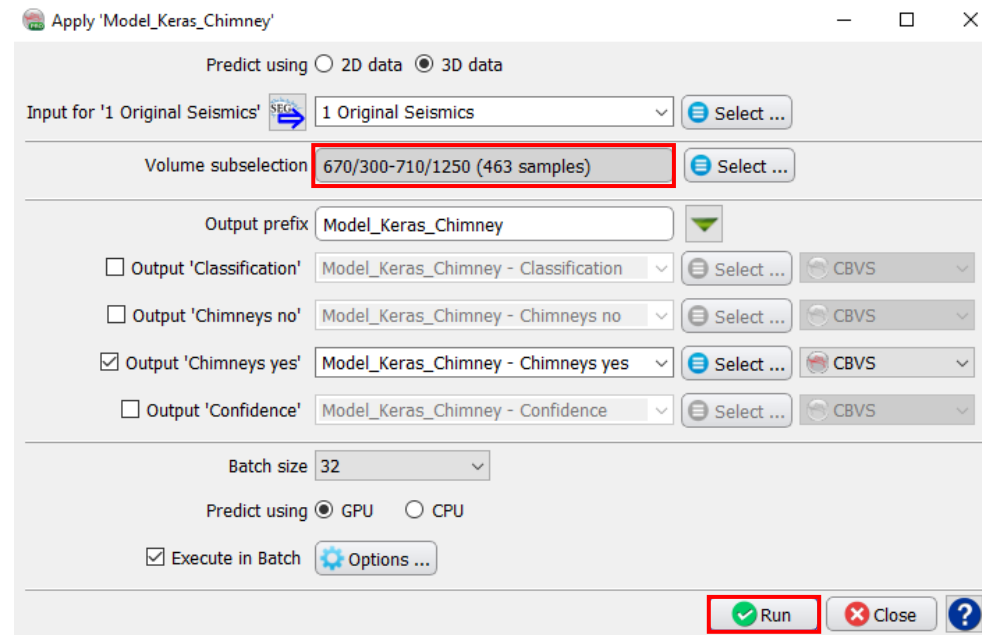
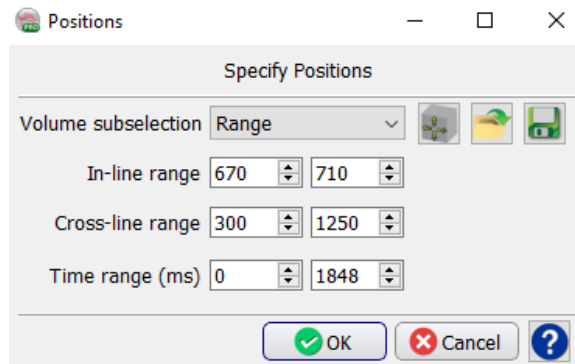
- 17. **Select** the "Apply" tab.
- 18. Select the trained model.
- 19. **Press** Proceed.



## Workflow cont'd:

20. In the “Apply created training model” window, **Verify**, all the default selected input 3D cubes are correct.
  - a. To optimize computation time, **Modify** “Volume sub-selection” and set it to an area of interest, where Chimneys have been interpreted (e.g. Inline range: 670-710, Crossline range: 300-1250).
  - b. **Specify** a new name for the 3D output cubes: Classification, Chimney yes, Chimney no, and Confidence. Toggle on Chimney yes.

21. **Press** Run to continue.

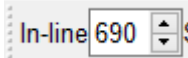


## Workflow cont'd:

QC results: display the predicted Chimney Yes probability 3D cube

22. **Right Click** on the: Scene > Inline > Add and select Data.
23. **Select** the predicted 3D Chimney location probability (e.g. Chimney\_yes), and overlay the seismic (e.g. 1 Original Seismic).

Modify the Inline number to be within the input range.

24. **Right-click** on the Inline number, and **Type** in the Inline field:  .

