SUMMARY:
1.- **Import** files (point clouds/3D models).
2.- Set the new **trackball center** for rotations, translations and room in/out.
3.- **Measure/Add points** from the point clouds or on the 3D model.
4.- **Copy** the coordinates of the added/measured points. Transfer to 3DVEM – Register.

Steps:

1. Import files (point clouds/3D models)

Click **Project/Import File** . This command allows you to import point cloud data (ASC, PTS, PTX) and also 3D models (ASC, OBJ, VRML). Fig. 1 shows an example of point clouds imported into 3DVEM – 3D Viewer, Editor & Meter.

Fig. 1. View of the imported point clouds. Worth noticing is that no points (targets/spheres) are recognized.

2. Set the new trackball center for rotations, translations and room in/out

After importing the files corresponding to the point clouds/3D models, the easiest way to navigate is setting a new **trackball center** for **rotations** (left bottom + mouse movement), **translations** (central bottom + mouse movement) and **room in/out** (turning the wheel of the mouse). It will be to act as

follows: (1) select the point cloud/3D model, (2) click on the new **trackball center** icon (when dealing with point clouds, it will be the closest point of the own point cloud (Fig. 2a); when dealing with 3D models, a new point will be interpolated on the own mesh), and (3) click with the left bottom to set the new trackball centre. Afterwards the scene will be readjusted to that new trackball centre (Fig. 2b), being very easy to navigate to new positions (Fig. 2c,d).

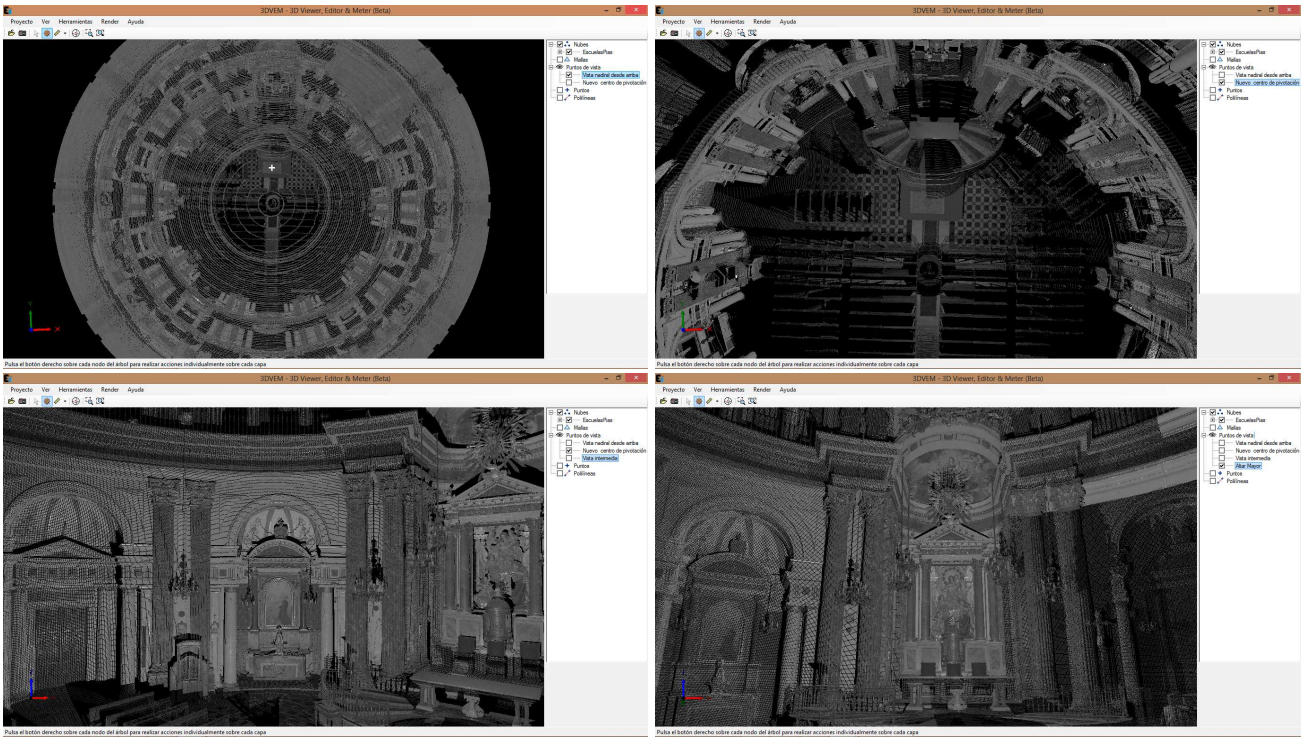

Figure 2. a) View of Fig. 1 with intensity values and placement of the trackball center; b) New position after clicking the new trackball center, and c) and d) Views from the bottom part.

3. Measure/Add points from the point clouds or on the 3D model

Click **Tools/Add /Point** to start. Points are added/measured after clicking with the left button on points or vertices of the object, or interpolating on the mesh of triangles. By clicking the right button on the desktop it is possible to open the context menu that allows users to: a) **Accept** points; b) **Cancel**; c) **Undo** the last inserted point; and d) **End** the measurements. Fig. 3 shows the result of adding/measuring 4 natural points from the point cloud. By right-clicking over a point in the Tree Structure, a new context menu is opened that allows users to **Rename**, **Copy** or **Delete** the inserted points.

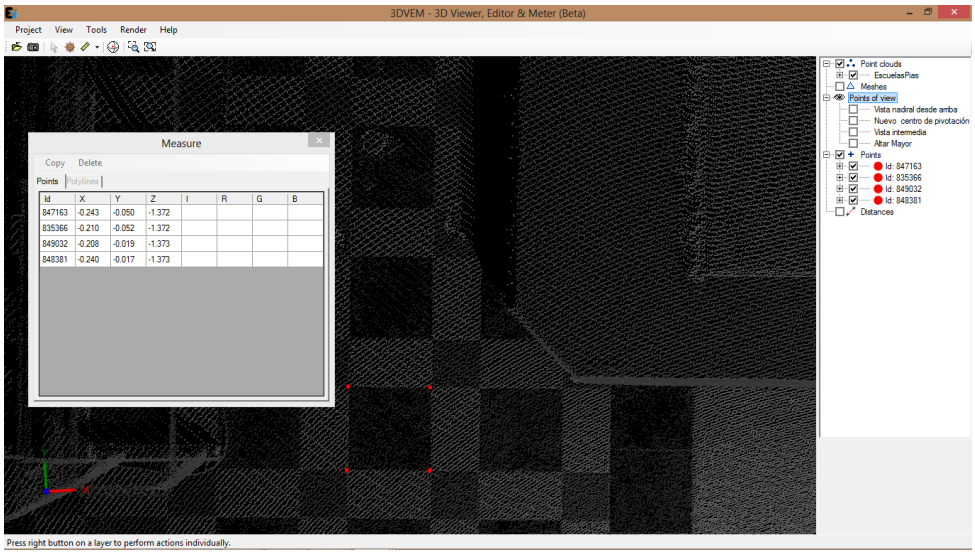

Figure 3. Result of the process of adding/measuring 4 natural points, once accepted.

4. Copy the coordinates of the added/measured points. Transfer to 3DVEM – Register

The coordinates of the added/measured points from either the point clouds or the 3D models can be listed or copied to create new files or transfer point coordinates between 3DVEM – 3D Viewer, Editor & Meter and 3DVEM – Register. From the Measure Table or from the list of Points (right panel) the points are marked (highlighted) to be copied to the clipboard. After clicking **Copy** or **Control-C** a confirmation message appears (Fig. 4). The command **Paste** can be used to copy data to a text editor for instance for saving, editing or renumbering.

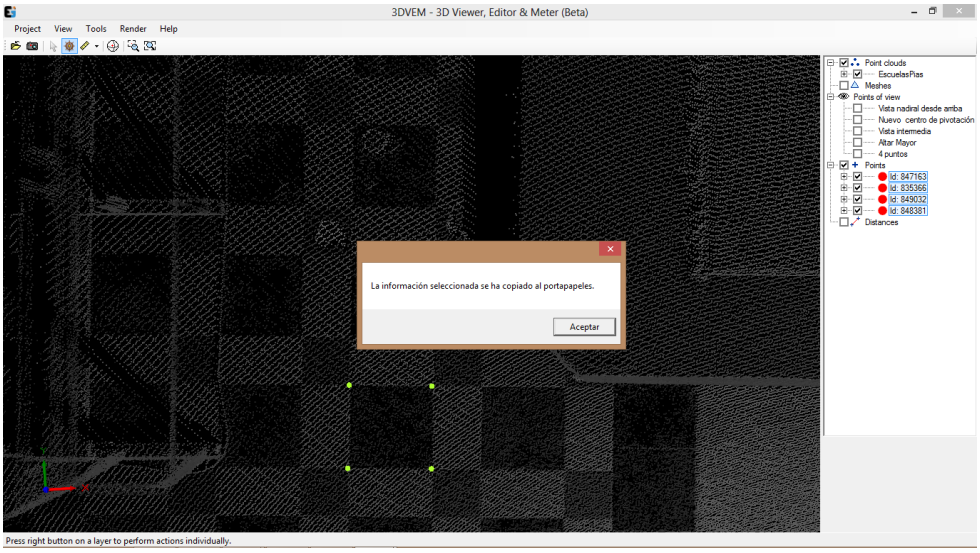

Figure 4. Confirmation of the result of copying the selected points to the clipboard.

More information can be found in the User's manual, YouTube tutorials/showrooms http://www.youtube.com/channel/UCGo2H2iRP9FDBySlh_hiv2A, http://gifle.webs.upv.es or write an email to gifle@upv.es.