

If you don't like change, you will like irrelevance even less.

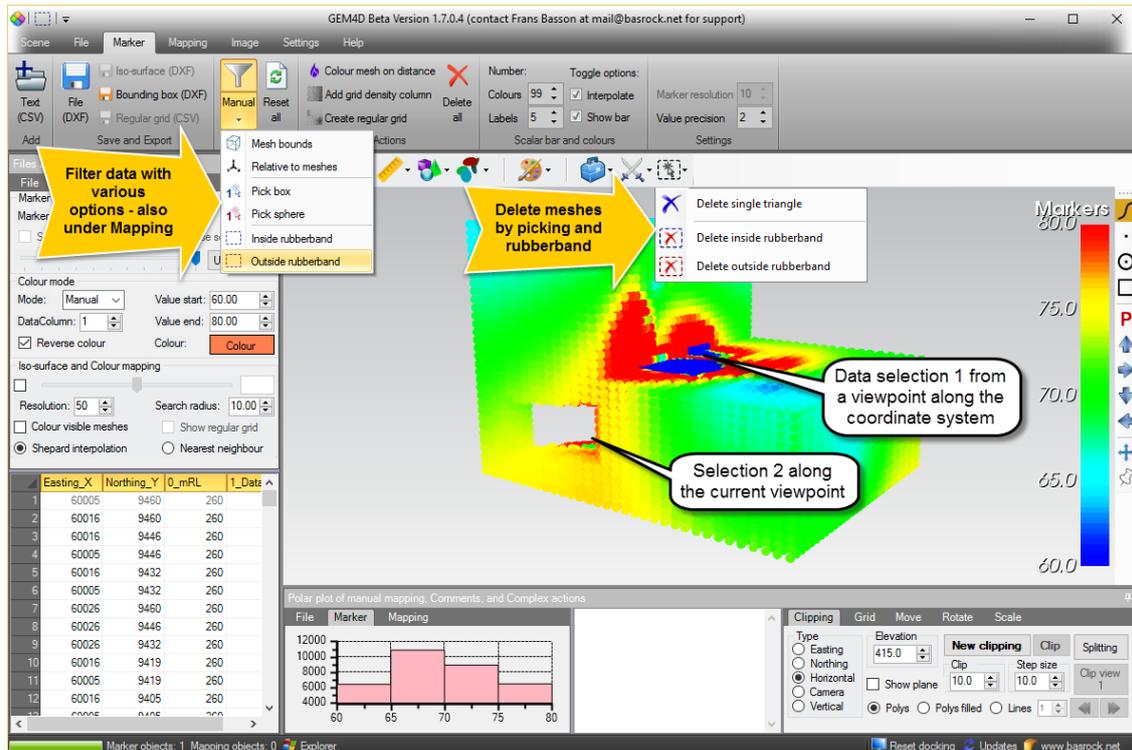
General Eric Shinseki

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# BasRock NEWSLETTER

## SOFTWARE FOR GEOTECHS 2015 Quarter 4



In-scene data filtering by selecting the view direction, then drag a rubber-band selection box across the data points. Alternatively, select your data relative to visible meshes - for example extract data between multiple fault triangulations, within slope meshes, below a pit shell etc. The filtering is cumulative and progressive filters apply to earlier selections to allow for complex combined selections.

For GEM4D and Trajec3D, navigate the scene using the mouse movements below:

- Rotate** - Left button.
- Zoom** - Right button or Wheel scroll.
- Pan** - Wheel press.

## Interfacing with reality

The interface change is now also completed for Trajec3D, and a major overhaul of PhotoCoreLog planned during 2016. The original PhotoCoreLog was completed to assist in a technical study for a site project, but I was distracted by other responsibilities before completion and decided to work on the initial vision during 2016.

### ***Rotation point -***

Double click on any object.

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Use the [Facebook](#) page to stay up-to-date with developments, and read the [Blog](#) for details.

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[GEM4D](#): A 3D geotechnical package that seamlessly combine triangulations from DXF-files with geotechnical data from comma delimited files (CSV).

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[Trajec3D](#): A 3D rigid body dynamics rock fall analysis program that accommodates 3D topographies from DXF-files and fall bodies of any shape and size.

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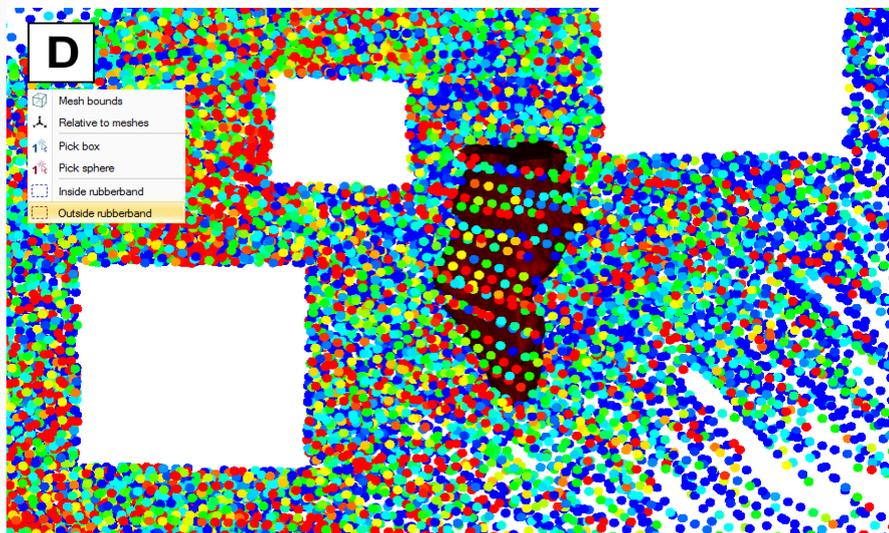
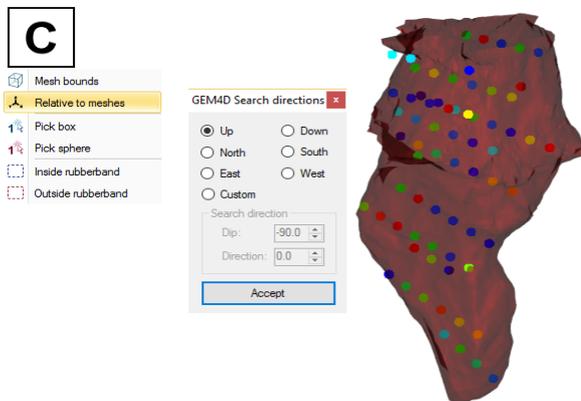
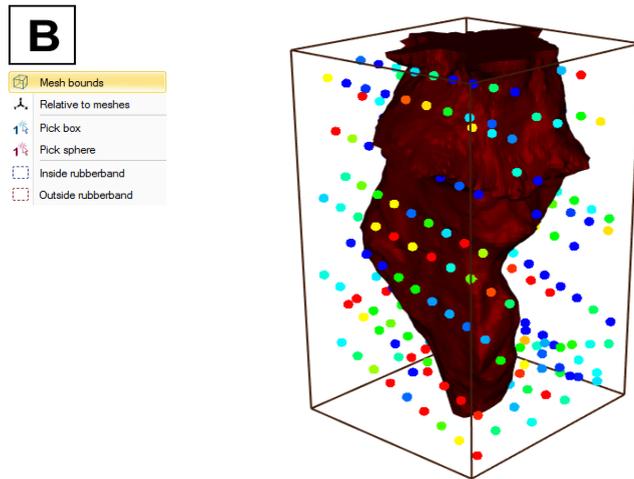
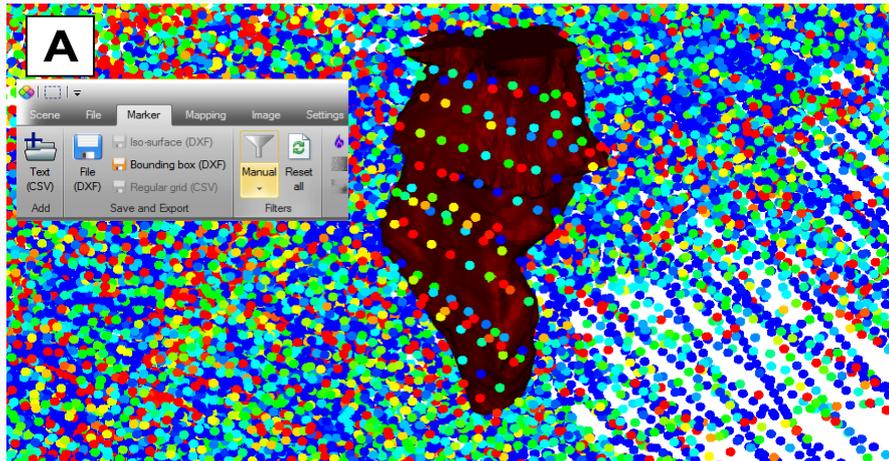
[PhotoCoreLog](#): Do your core logging from photographs, and even deskew photos taken from an angle. A major overhaul is planned.

## **All packages**

1. Development moved to Visual Studio 2015.
2. Program installation to Microsoft Windows 10 is now supported.
3. All programs now require the full Microsoft dotNET 4.0 framework.
4. Expiry dates moved to 1 July 2016.

## **Main additions to GEM4D**

1. Docking panels settings can be changed and saved under "**Ribbon => Settings => Interface settings => Save (SET)**". These settings are automatically loaded, and could be cancelled by pressing "**Reset default**".
2. Markers and Mapping scalar bar visibility can now be separately toggled .
3. When coloring polygons on "**Dip angle**" or "**Dip direction**", double clicking on the polygons now also display the angles.
4. An picking option to the center of objects was added. This can pick to centers of marker spheres, mapping discs etc. The pick mode can be changed as you pick, it is thus possible to pick to surfaces, vertices and object centers whilst creating a poly-line.
5. The iso-surface values for "**Resolution**" and "**Search radius**" can now be changed to any value (not only preselected values).
6. Addition of many data filtering options as discussed in this newsletter.
7. Delete individual polygons from meshes by mouse picking, or with a rubber-band selection box along the camera view.
8. Line intersections with polygons are now recorded when splitting meshes.
9. Load OBJ-files with their associated texture files.



Examples of different filtering options:

A - Original data set and the location of the filtering options on the ribbon.

B - Select the data within the bounding box of a visible mesh.

Data extracted in this way is ideal for creating iso-surface afterwards.

C - Select data relative to visible meshes. In in this case, I filtered on "Up" and then "Down" to extract only the data within the mesh.

D - Select data outside the rubber-band selection box along the current camera view. Multiple selections were made, and filter from different viewpoints.

*After data filtering, the points can be saved as separate files for use in other packages with "Right click in the data grid => Save data as CSV-file".*

## How do I create PDF3D-files?

PDF3D allows for the display of 3D-scenes within normal PDF-documents, and many users requested support for PDF3D-files. I contacted Adobe, as the best way would be building the support into GEM4D, but Adobe is not comfortable providing their development solution to free software. Although I could not obtain a quotation, seems the cost would be substantial.

But, it is possible to create PDF3D-files from GEM4D-files with MeshLab from <http://meshlab.sourceforge.net/> and MiKTeX from <http://miktex.org/download>, both freeware packages (MiKTeX is not required if you have [Adobe Acrobat DC](#), which can directly embed U3D-files from MeshLab into PDF-documents). Download and install both packages and follow the procedure that is explain in more detail [here](#):

1. Export the scene from GEM4D as an OBJ-file with "**Ribbon => File => Export => Other formats => VRML (WRL)**"
2. Start MeshLab and import the mesh using "**File => Import Mesh**", making sure to select "**VRML 2.0 File Format (\*.wrl)**" from the format drop-down list. The GEM4D colours for meshes will transfer correctly.
3. Export the mesh with "**File => Export Mesh As**" and select the output format "**U3D File format (.U3D)**". **IMPORTANT - no spaces are allowed in the selected file name.**
4. Check the "**Face => Color**" option in the "**Choose Saving Option**" dialog.
5. Set the "**U3D quality**" value as required, the default value of 500 works well, but select 1000 for best quality result.
6. MeshLab automatically creates both a U3D and TEX file. The TEX-file is required to create the PDF3D-file from the U3D-file format.
7. MikTex does not create desktop icons, but available from the Windows start menu. Many executable files are installed, make sure you start "**TeXworks**", and select "**File => Open**" and select the MEX-file created by MeshLab (remember no spaces in the file name).

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- Pick "**pdfLaTeX**" in the top left selection drop-down box, and click the green arrow to convert the file to PDF3D.
  - When an additional TeXworks window comes up with the selected file name on a blank screen, the process is completed and the created PDF-file can be opened with Acrobat Reader. In the PDF3D-file, only one side of the polygons are visible, so rotate the scene to find the best view.

Download example PDF3D-files that I have created:

- Using TeXworks [here](#).
- Using Adobe Acrobat DC [here](#) - free Acrobat DC trial available from [here](#).
- Using PDF3D ReportGen [here](#) - most expensive option but creates the best results (you have to request a trial from [here](#)).

I prefer to use [Sketchfab](#) when sharing 3D-scenes over the web - have a look at the same file in Sketchfab by clicking [here](#).



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