

Depth map manual for "DUMMIES"

(...or for those of us with limited computer knowledge...)

Version 12

Akkelies van Nes, a.vannes@tudelft.nl and Chunyan Song

Important preparations for axial analyses:

Downloading Depthmap software:

Go to the site:

<https://github.com/SpaceGroupUCL/Depthmap>

Click on the download button, or go to:

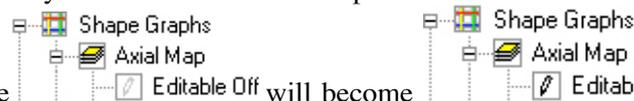
<https://github.com/SpaceGroupUCL/Depthmap/downloads>

and download the DepthmapSetop1014.exe file

Draw an axial map on a separate layer in Autocad, Vector works or adobe illustrator. It is IMPORTANT that you use a "single line" instead of a "multiple line". And make sure that all lines are well connected!!! Export only the axial lines layer as a **dxf file**.

Making axial analyses:

1. File + new
2. Map + import (choose one of your dxf files with axial lines)
3. Map + convert drawings layer. Under "new map type", choose "axial map". Tools + Axial/convex/Pesh + run graph analyses. Set radius n or 3 or 5 etc. Then just wait. The larger file, the longer time to wait. The local integration values like 3, 5, 7, 10 etc takes short time. On the left side, all the processed maps are presented. Radius "n" means global integration or "integration [HH]" as shown on the left side, radius 3 means local integration with radius 3 or "integration [HH]R3" etc.
4. In order to identify unlinks, click on "node count" on the left side. If there are any unlinks, most of the axial lines are red and the unlinked ones are blue. Correct the unlinked lines in your dxf file from autocad, adobe illustrator, vector works...etc. If all lines are linked, then all the lines are coloured in green.
5. Draw extra lines or remove lines. Click on the + at the axial map folder. Then click on "editable" on the folders on the left side (where you see the processed data). This step is important, otherwise you can't edit the axial map.



Which are show like  will become , then you can edit the axial map.

Click on the axial line you want to remove or make longer. For deleting lines: Edit + clear. Click on the line if you want to draw an extra line. After finishing this, run all the axial analyses again(important).

6. File + save as (give the city name or the area name, for example "delft.graph")



7. Unlink lines: Click on the "unlink" button.
Then click the first line, and then click the second line.



8. Re-link lines: Click on the "link" button.
Then click the first line and then the second line.
OBS! You can only re-link or unlink 2 lines at the time.
9. Making bridges or tunnels: click on the link button, then click on the first line and then on the second line.
10. Remove bridges and tunnels: click on the unlink button, then click on the first line and then on the second line.

Use the folders on the left for looking at various integration values:

Global integration: “integration [HH]”

Local integration with radius 3: “integration [HH]R3”

Local integration with radius 7: “integration [HH]R7”

The red lines shows the streets with the highest integration values, while the blue ones shows the most segregated ones. Put the cursor on the axial lines in order to get the various integration values (in numbers).

Recentre the image

11. Click on the recentre button  in order to fit the map to the screen.

Making Axial step depth analyses:

12. Select a line or several lines (then you must use the "shift" key). Then click on the "step depth" button .

Making angular analyses: Before doing the angular analyses you must run the axial analyses!!!!

13. Map + convert active map. Under “new map type”, choose “segment map”.

14. Tools + segment + run Angular segment analyses. Set the radius (n=global integration, 3=local integration with radius 3 etc....). There are different options you can test out.

15. Use the folder on the left and click on the Total Depth folder or Total depth R3 or R5 etc. There you will see the results of your analyses.

Segment Step Depth Analyses (+Angular Step/ +Topological step/ +Metric step)

16. You choose one line (a street segment) or several lines (streets), then go to --> Tools + segment + Step depth + **Angular step**. On the left side, the arrow is on the Angular step depth column  Angular Step Depth. The result shows the values of Angular changes of streets net from the Chosen street.

17. You choose one line or several lines, then go to --> Tools + segment + Step depth + **Topological step**. On the left side, the arrow is on the Angular step depth column  Angular Step Depth. The result shows the value of the directions changes of streets net from the Chosen street, which is Axial map based result.

18. You choose one line or several lines, then go to --> Tools + segment + Step depth + **Metric step**. On the left side, the arrow is on the Angular step depth column  Angular Step Depth. The result shows the pure metrical value of streets net from the Chosen street.

Adding metrical radiuses and metrical properties to the axial analyses

19. Tools + segment + Run Topological or metrical analyses.

20. Click on topological. You need to type value in Radius (metric units). The value you type in Radius(metric units) is dependent on the middle coordinates which displayed at the lower right corner of the software display window.

5539	208.139 x 252.236	226.018, 152.733
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For example, if it shows 208.139 x 252.236, you have to take the first number. Here in this case is 208.139, and before the point is 208. In this case you can take 208 for high value, and 10% of high value 200, which is 20, for low value.). In this example, you can type radius 200 and 20 in Radius(metric units). Put only one radius at a time. Then click “ok”.

21. In the folders on the left side, you find the various measurements with your metrical radiuses. Click on the “topological choice” with the various radiuses, you will find the results from your analyses where angular choice, topological distance combined with metrical radiuses are shown. When you click on the “metric choice”, the metrical shortest routes combined with angular choices are shown.

Adjusting colours for highlighting the analyses or for making grey scales images

22. Click on window + colour range. There you can choose between black and white, or adjust the colours in order to highlight the integrated structure in your analyses.

Use Invert color range bottom  can simply reverse red to blue color.

Exporting data:

23. Edit + export screen (an eps file will be made). The file can be imported into various photoshops programs or powerpoint. Edit + copy screen is useful for pasting images directly into powerpoint files. Under “layer + export” you can export map info (mif) files or txt files useful for GIS, autocad, adobe illustrator or vector works.

Making scattergram:

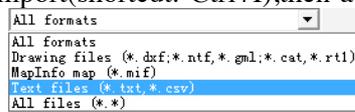
24. Click on window + scatterplot. Then a window will be opened with various options. The most usual is to show the correlation between local with $R=3$ and global integration $R=n$.
25. By clicking on the R^2 button , the correlation coefficient is shown between local and global integration.
26. Another option is to look at “Mean Depth R 3 metric” on the vertical axe, and “Mean Depth R n metric” on the horizontal axe. Or look at the correlation between the analyses with a low and a high metrical radii.
27. The scattergram are also useful for identifying unlinked lines that are hard to see on the axial map (because they are very small). Use node count on both axes and mark the blue one. Then the unlinked line (or lines) are marked and you can choose to delete them or correct them (see point 5.)

View the table:

28. Click on window + table. There you will see all the processed values. If you want the variables of a particular line, click on the line before you open the table. Then the relevant line will be on the top in the table.

Import/Export data from GIS:

29. Map+ Import(shortcut: Ctrl+I),then a window will pop up, you can choose the typology



of data, text files (*.txt;*.csv) *.txt or *.mif, which you exported from GIS. For example,you can import the unlinks file as a txt file to Depthmap from GIS.

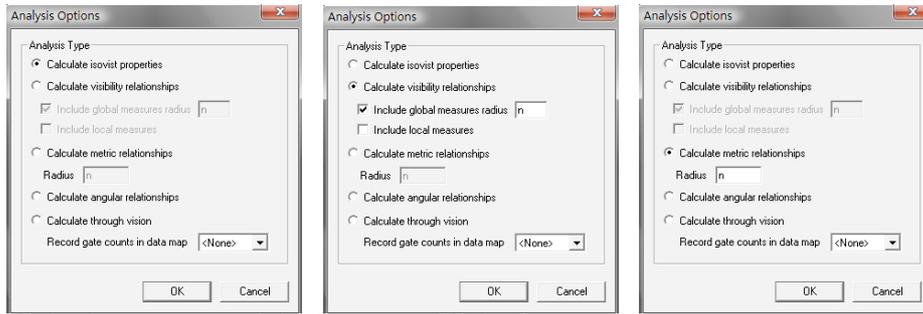
30. Map+ Export(shortcut: Ctrl+E),then a window will pop up, you can choose the typology of data to export to GIS or other programs.

Important preparations for all lines, isovist and point depth analyses

Draw a map with all obstacles (building, trees, water etc) with CLOSED polygons of a local area on a separate layer in Autocad, Vector works or adobe illustrator. It is IMPORTANT that you use multiple lines. Do NOT use the circle when you place the trees. Export only the closed polygon layer as a **dxg file**.

Making visibility graph analyses:

31. File + new
32. Map + import
33. Tools + visibility + set grid (various options). Or you can press the set grid bottom  .
34. Click on the fill button  and then your mouse sign will show as  ,click on the "public spaces" on the drawing
35. Tools + visibility + make visibility graph.
36. Tools + visibility + run Visibility Graph Analysis. Then a window appears (window 1).



Window 1

window 2

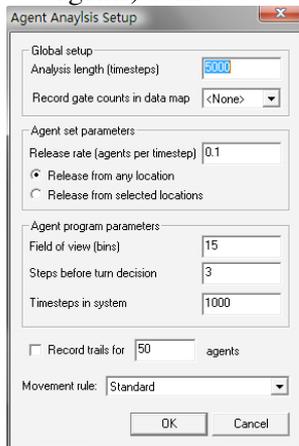
Window 3

37. You can choose between metrical relationships (window 2), visibility relationships (window 3) with a radius like "n" or 3, 5, etc, or isovist relationships. Then click ok. It will take a long time – depending on how fine-grained the grid is.

38. View + show grid (in order to remove the grid)

Making agent based modelling analyses:

39. Tools + agent tools + run agent analyses + set a number of agents (use for example 5000 agents) + ok



Field of view =15 , Steps before turn decision =3

40. Click outside the drawing (then you see their traces). Use “view + show grid” in order to remove the grid.

41. In order to put in individual “moving agents”, use “window + 3D view”. Click on the . Then you can click on the public spaces in your drawing in order to place a set of agents.

Their movement traces can be seen if you press the agent trace bottom .

More detail explanation about the bottoms show in the software:

You can use the bottoms to start , pause  or stop  the movement of the agents. You can rotate  the analysis, move the analysis by Pan tool bottom , Zoom the analysis by zoom bottom  and Camera the view from distance by click bottom .

You can also change the analysis background into color based by click on bottom . If you finished your agent analysis, you go to “window + 3D view”, then you'll be back to former 2D analysis again.

Making all lines analyses:

42. File + new

43. Map + import

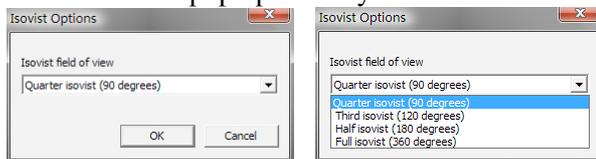
44. Click on the all lines button  and then your mouse sign will show as , click on the "public spaces" on the drawing.

Making axial and segment map from all lines analyses:

45. Tools + axial/convex/push + reduce to fewest line map.
46. Click on the fewest line map (minimal) folder on the left side  Fewest-Line Map (Minimal)
47. Tools + axial/convex/push + run graph analyses + set radius (n=global integration or integration HH, 3=local integration with radius 3 or integration (HH)R3 etc....).
48. Click on "node count" on the left in order to look for unlinks. If there are no unlinks, the lines inside the map is green, otherwise they are red. Then you click on bottom "+",  Fewest-Line Map (Minimal) which shows in the first place in the Fewest-Line Map(Minimal) folder on left side. Then it will become "-", which will show "Editable"  Fewest-Line Map (Minimal)  Editable On  Everything on below Fewest Line Map(Minimal) folder column (Important! When it is "Editable off", you cannot edit the map!) Now you can start to delete these unlink lines. You mark the line, then use "edit + clear". Then the line will disappear.
49. For making **angular analyses**: Map + convert Active layer. Under "new layer type", choose "segment map". Then use tools + segment + run Angular segment analyses. (use the steps described in the angular analyses, point 13-15)

Making isovist analyses:

50. File + new
51. Map + import
52. Click on the isovist button  and then your mouse sign will show as , click on the "public spaces" on the drawing where you want the root of the isovist. There will be a window will pop up where you can choose different degrees.



then click OK.

You can choose between 90 degrees, 120 degrees, 180 degrees or 360 degrees from the window.