In-Class Work: Scientific Talks & xfig & DLA (continued)

Scientific Talks: Take a few minutes to think about very good scientific talks. Which? What made the talks so good?

Xfig Intro

I will guide you through the following main commands of `xfig`, which is drawing tool:

- To get started: Type on the command line: `xfig &`
  This will open a new window.
- drawing tools: background grid, circle, line, text, picture, grouping, scaling, copying, editing.
- To save an xfig session use `File` → `SaveAs` and give your xfig-file a name ending with `.fig`. You can get back to this session any time on the command line with `xfig filename.fig &` or within xfig with `File` → `Open`.
- To make an eps-file out of your figure use `File` → `Export`, make sure to choose "EPS (Encapsulated Postscript)" and choose the same filename but with the ending `.eps`. This eps-file can then be included in your latex file for the paper. (Later into the course I will also show you a variation of latex, latex beamer, which we will use to make talk-slides. You will be able to use the same eps-files for the paper and for the talk and therefore your work on the eps-files for your paper will be very handy for your talk preparation.)

Optional: Comment for Advanced xfig Users who like Latex:

In case you would like to use latex commands within xfig use the following steps: First copy
`~kvollmay/share.dir/inclass2023.dir/xfig2eps`
and
`~kvollmay/share.dir/inclass2023.dir/xfig2pdf`
then make both executable (these are perl-scripts)
`chmod u+x xfig2*`. These `xfig2*` files will be needed for step (3) below.

Instead of `xfig` use instead
(1) `xfig -specialtext -latexfonts -startlatexFont default`
(2) first save then export to "Combined PS/LaTeX (both parts)."
This creates two files: `filename.pstex` and `filename.pstex_t` . To then make an eps-file (which you can include in your paper) (3a) `xfig2eps filename`
or to make a pdf-file use
(3b)`xfig2pdf filename`

Figure(s) for Model Section To practice a bit, start working on a figure for your talk, which is helpful to explain your model.

You find the solutions to last's class in-class work in
`~kvollmay/share.dir/inclass2023.dir/classfractal*.py`
I will walk us through `~kvollmay/share.dir/inclass2023.dir/classfractal5b.py`

6. Stick to Cluster

Next we will work on rule V, the sticking of a random walker particle to the cluster, if the random walker is next to a cluster cell. We use "von Neumann neighbors", which means a neighbor cell up,down,left or right.

6a. Next add to your program of 5b. that whenever the random walker is next (left, right, top, bottom) to a particle of the cluster then the random walk stops (`walkstop` update). Use the flow chart to decide where to add the necessary lines. If you have kept the `print(x,y,LATMID,r)` from 5a (and the same seed) then you can check that your program is working right.

6b. Now add to your program of 6a that you also have an integer variable `npart` which is initialized to be `npart=1` and gets increased by one whenever a particle sticks to the cluster. Also update `lattice` whenever a particle sticks. Whenever a particle sticks to the cluster, you also need to check if `RMAX` has grown and if so, then you need to update `RMAX`. Add this to your program.

7. Finish Program: Loop Over Particles

Now you are ready to finish your DLA program! Add to your program a while loop over particles. Condition for this while loop are both that the wanted number of cluster particles `NPARTMAX` has not yet been reached and that the radius for the stopping of a too far out random walker fits into the lattice. Use the flow chart of class to decide where to add this `while`-loop. Use the constants `LATSIZE=100, NPARTMAX=50`. Comment out the printing of `(x,y,LATMID,r)`, but print the resulting lattice at the end (so after the particle-loop). In case you would like not to print the complete lattice, you may use the following commands

```
plt.imshow(lattice[int(LATMID-RMAX-2):int(LATMID+RMAX+2),\
  int(LATMID-RMAX-2):int(LATMID+RMAX+2)],interpolation='nearest')
plt.savefig('frame7.pdf')
```