

Redes Complexas

Part 1

The challenge for this assignment is to explore the characterization of complex networks in line with what was discussed and seen in both theoretical and lab lessons. You can follow different approaches:

1. You may choose a real-world dataset and analyze it. There are several datasets accessible at our labs section. For instance, [here](#), you can find several examples of technological, biological and social networks, and associated papers which can be helpful at the time of writing your discussion and guide your analysis.
2. You may choose to focus on computational challenges concerning the characterization of large networks. For instance, you can explore Webgraph and other associated tools, which provide some examples of application (see the examples shown on our labs). This line can also be extended to the 2nd project.
3. You may also take this opportunity to develop your own simple network code in your favorite language, implementing some of the metrics discussed in the course (as you will see, this is pretty straightforward and may be useful for the second project).
4. Finally, you may also take some time to learn how to use one of the network libraries available (in C/C++, Python, Mathematica, Matlab, etc), writing down a short tutorial on how to use it, perhaps with a few examples.

In any case, your discussion should take into the usefulness of metrics considered, what can we learn from them, potential applications, the comparison of several datasets and/or models, or computational issues. Above all, in this 1st project, we shall evaluate your eagerness to explore topics and tools that likely are new to you. Please let us know if you are lost among these options.

Format and delivery

The maximum number of pages for the report is 4. It should contain a short introduction, a summary of gathered results (if any), a brief discussion and supporting references. The report must be uploaded in pdf format using the Fenix system. If applicable, we ask you to include any code you find relevant with the submission (you may submit a single zip file) or to include a link to your code in the report, assuming that you make it available in a public repository.

Part 2

You will be free to choose a theme on network science or modeling and simulation which is close to your background and interests. All groups will address a different topic, such that, at the end of the semester, we may organize a small workshop in which we all discuss each other projects. Each group will be able to select a topic / challenge, which typically includes the discussion and (hopefully) the replication of some published results.

The deliverables are:

- (i) a short (10 minute) in-class presentation of the project results, and
- (ii) a short write-up (max 8 pages) and related code (if applicable or central to the project).

Format and delivery

The maximum number of pages for the report is 8. It should contain a small introduction, a summary of gathered results, a brief discussion and supporting references. Please include any code you find relevant with your submission (you may submit a single zip file). Given the multitude of packages and third-party libraries you may use, it would be very helpful if you add a [readme](#) file with an overview of the code, dependencies, configuration/installation instructions, etc. Otherwise, it will be hard for us to evaluate your effort... Many thanks in advance!

About the presentation

Please note that we are not expecting that you submit any presentation together with your report (see above). You can think on your presentation after submitting your 2nd project. If you need a hand on how you should present your work, please let us know. Important: The goal is to be entertaining.