Instruction Sheet for the Practical Sessions

All the material for the practical sessions will be available in Git, including this instruction sheet, that can be directly downloaded from the link provided below. For the practical sessions, we will be using R as the programming language. In the Git link, there will be two types of files for each day as follows:

- Jupyter notebook files, with extension '.ipynb',
- R-codes, with extension '.R',

Git link: **https://github.com/moguzalper/Graph_Sampling_ISI2021.git**

N.B. The current versions of the R-codes and the Jupyter files do not include the codes that will be run during the practical sessions. These files will be updated with inclusion of the exercise codes just after the course. Therefore, you should check the Git link to download the last versions of the files.

Files can be directly viewed in Git by clicking on the file name. They can also be downloaded from Git as follows.

- Copy the Git link in to your Browser (Chrome, Internet Explorer, Fire Fox, etc.).
- Click on 

- Click on 'Download ZIP'

R-codes can be compiled with any of these tools: R, RStudio, Jupyter Notebook or JupyterLab. Below we describe from where these tools can be downloaded.

R: The program R can be downloaded here: **https://www.r-project.org/**

We recommend a desktop version (windows or mac is fine). Click on the link called CRAN on the left hand side of the website and choose the nearest location for you. Choose download for Windows or Mac OS X depending on your computer and install the program. Most of what we will be working on during the practical sessions is not greatly version reliant.

RStudio: Rstudio is an integrated development environment (IDE) for R. It is very useful when programming and we recommend using it for the course. A free opens-source version can be downloaded from here:

https://rstudio.com/products/rstudio/

Download the Open source Edition for Desktop. With the standard installation setup RStudio should find the downloaded and installed R.

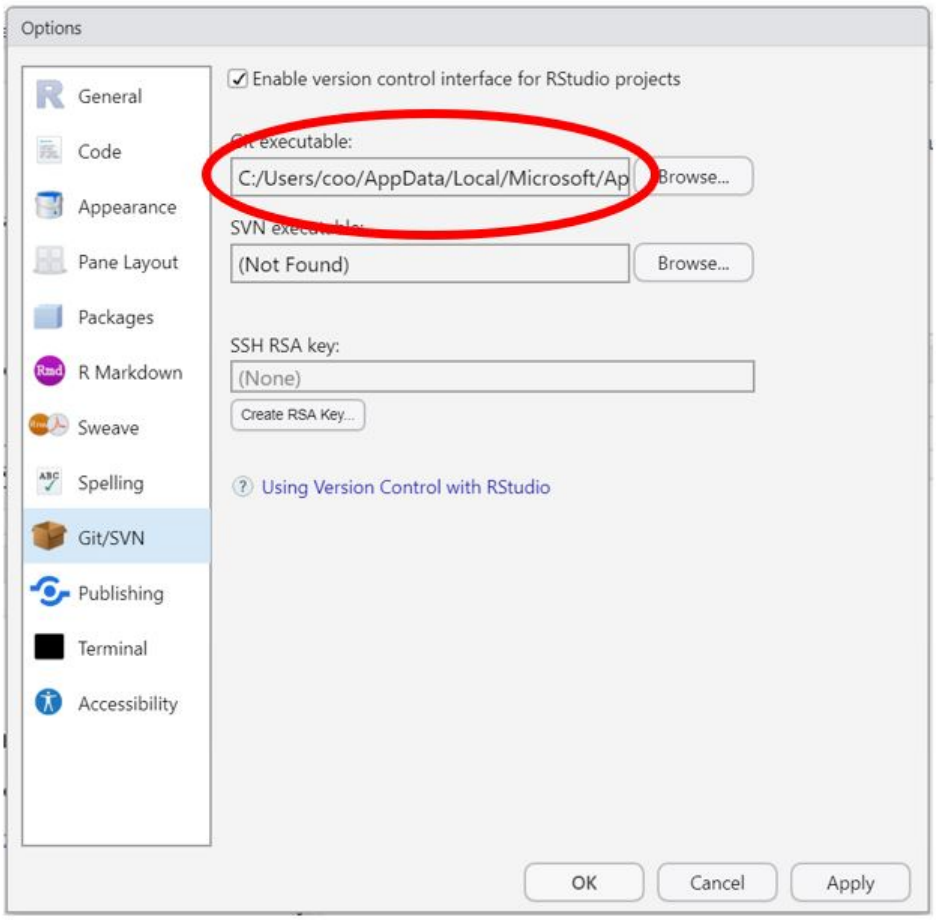
Using Git with RStudio Git is a tool to assist in keeping track of changes in code. It is also a collaboration tool for sharing code with other people. It is free and open source and can be downloaded from here:

https://git-scm.com/downloads

After downloading, install the application. You may need to remember where you have installed this in the next step.

To use Git with RStudio, we need to tell RStudio where the application is located. This may not happen automatically. To do this:

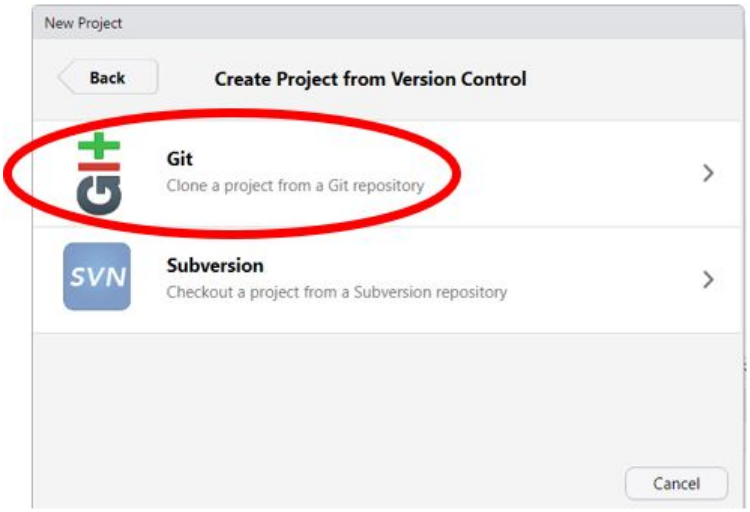
- Open RStudio
- Choose Tools from the main menu
- Choose Global options
- Choose Git/SVN



You should see a link to the git application (git.exe) in the path under git executable. If you do not see this, click the Browse... button and navigate and select the git.exe file. This should be in the folder of the installed git application. Sometimes these files can be hidden. If you are having trouble finding it, try starting a file explorer, and searching for "git.exe". You may need to cross "show hidden elements" under the view option.

To check if it is working:

- Choose File from the main RStudio menu
- Choose New Project
- Choose Version Control



If it is joined correctly, you should see a Git option.

Clone a repository Now, go to the Git link **https://github.com/moguzalper/Graph_Sampling_ISI2021.git**

- Click on 
- Copy HTTPS adress (URL)
- In **RStudio**:
  - File New project Version control Git
  - Paste in address under "Repository URL"
  - Browse a directory which you want to create the project as a subdirectory of
  - Click "Create Project"
  - **Save files** you change with a new name

Jupyter Notebook and Jupyterlab The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. It supports several languages including Python and R, and is largely used for data analysis, data visualization and further interactive, exploratory computing.

JupyterLab is a web-based interactive development environment for Jupyter notebooks, code, and data. It has a modular structure, where you can open

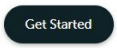
several notebooks or files (e.g. HTML, Text, Markdowns etc.) as tabs in the same window.

Installation details can be found from here:

https://jupyterlab.readthedocs.io/en/stable/getting_started/installation.html

To install Jupyter Notebook or JupyterLab with 'conda', install 'Anaconda' first. The Anaconda installers can be found from here:

https://www.anaconda.com/

Click on 

on the right top corner of the website, and then, click on 

Once Anaconda installed, you can use 'Anaconda Prompt' window to install Jupyter notebook or JupyterLab by following the instructions provided in the link above. The Jupyter notebook or JupyterLab can be launched by writing 'jupyter notebook' or 'jupyter lab', respectively, in the Anaconda prompt window.

N.B. Jupyter notebook can be opened from JupyterLab by selecting "Launch Classic Notebook" from the JupyterLab "Help" menu

N.B. Unlike Python, R may not automatically appear as a kernel in the Jupyter Notebook. To add R kernel to Jupyter Notebook/Lab, follow the instructions provided here:

https://datatofish.com/r-jupyter-notebook/

To open an .ipynb file in Jupyter Notebook :

- Click the "Upload" button to open the file chooser window.
- Choose the file you wish to upload
- Click "Upload" for each file that you wish to upload

To open an .ipynb file in JupyterLab : Navigate the folders on the left panel in JupyterLab to open the file from the directory it is located in