* https://github.com/aimvo/PD\_Assortativity.git
* MATLAB codes
  + aimvo\_joint\_distribution.m
  + aimvo\_graph\_plot.m
* A dataset to demo the codes
  + demo\_AdM.mat
  + Node\_ID\_PDRP\_PDCP.xlsx
* A README file that includes:

1. System requirements

* All software dependencies and operating systems (including version numbers)
* Linux 64bit
* MATLAB software (Version R2019a or R2020a, The MathWorks) is required to be installed on your computer in order to run the codes.
* Toolboxes are required:
  + Mathematics/Graph and Network Algorithms, MATLAB R2019a or R2020a
  + Brain Connectivity Toolbox (https://sites.google.com/site/bctnet/)
* Codes (Version1) have been tested in MATLAB R2019a and R2020a
* No non-standard hardware is required

2. Installation guide

Instructions:

* Download codes (<https://github.com/aimvo/PD_Assortativity.git>)

Typical install time on a "normal" desktop computer is less than: 1 minute

3. Demo

***Joint probability distribution***

Required toolbox:

Statistics and Machine Learning Toolbox, MATLAB R2019a or R2020a

Required files:

aimvo\_joint\_distribution.m

demo\_aimvo\_joint\_distribution.m

*Expected output*: demo\_aimvo\_joint\_distribution.png

*Expected run time for demo on a "normal" desktop computer*: 7 seconds

***Graphical configuration***

Required toolbox:

*Graph* function in Mathematics/Graph and Network Algorithms, MATLAB R2020a

Brain Connectivity Toolbox (<https://sites.google.com/site/bctnet/>)

Required files:

demo\_AdM.mat

Node\_ID\_PDRP\_PDCP.xlsx

aimvo\_graph\_plot.m

demo\_aimvo\_graph\_plot.m

*Expected output*: demo\_aimvo\_graph\_plot.png

*Expected run time for demo on a "normal" desktop computer*: 1 seconds

4. Instructions for use

***Joint probability distribution***

Simulation steps for 2D displays of the joint probability distribution are performed using Statistics and Machine Learning Toolbox, MATLAB R2020a. Two input parameters (rho, lambda) are estimated from the empiric data from each group and network. Lambda is the average degree of a network, and rho is the degree correlation or assortativity coefficient of a network or a subnetwork.

Run:

* demo\_aimvo\_joint\_distribution.m

*Expected output*: demo\_aimvo\_joint\_distribution.png

***Graphical configuration***

Graphical configuration is constructed using *graph* function in Mathematics/Graph and Network Algorithms, MATLAB R2020a.

Run:

* demo\_aimvo\_graph\_plot.m

*Expected output*: demo\_aimvo\_graph\_plot.png