User Manual

1. Method Description

MCGLLDA is a novel method based on multiview consensus graph learning to predict the lncRNA-disease associations. It overcome some of the limitations of the existing methods such as averaging the input similarity information and took fully advantage of the existing information to obtain a superior prediction. First, it constructed a set of similarity matrices for lncRNAs and diseases in terms of the known lncRNA-disease associations. Then it learned a consensus graph for lncRNAs and disease from the multiple similarity matrices and obtained the association probability between lncRNAs and disease. The experimental results show that the proposed method can obtain the best performance effect compared with state-of-the-art methods.

2. Requirements

MCGLLDA was developed in MATLAB 2014b environment, but it should be working in all MATLAB versions.

3. Usage

We provided a functions, case study for users. To run the case study, please load the script 'main.m' into your MATLAB programming environment and click 'run'.
All the datasets used in the code are all provided in the corresponding 'datasets/*.mat'.

4. Parameters

There are two parameters alpha and beta in MCGLLDA. The default value of alpha is 0.001 and beta is 0.0001. Users can change their value in "MultiViewPrediction.m" file.

5. Output

The default output directory of MCGLLDA is under the same directory where the scripts locate and it can be changed in the 'caseStudy.m' file accordingly. All the results are stored in 'mat' file for convenience.

6. Function of all files

GaussianKernel.m

Through cos function to calculate a new disease similarity matrix and a new lncRNA similarity matrix

consine.m

Through cos function to calculate a new disease similarity matrix and a new lncRNA similarity matrix

GetCaseStudy.m

Calculate the final prediction matrix

L2_distance_1.m

compute squared Euclidean distance

caseStudy.m

Run the algorithm through this script

MultiViewPrediction.m

Calculate the results from the multi-view prediction

alternativeUpdate.m

Complete the main iteration function with various parameters

UpdateS.m

Update SD SL matrix

EProjSimplex_new.m

minimize 1/2 || x - v||^2

UpdateW.m

Update weight matrix

Datasets\Datasets1\disease_Name

Disease names in this database

Datasets\Datasets1\lncRNA_Name

LncRNA names in this database

Datasets\Datasets1\disSim_Jaccard.mat

Disease similarity matrix in this database

Datasets\Datasets1\lncSim.mat

LncRNA similarity matrix in this database

Datasets\Datasets1\interMatrix.mat

LncRNA-Disease incident matrix in this database

Datasets\Datasets2\disease_Name

Disease names in this database

Datasets\Datasets2\lncRNA_Name

LncRNA names in this database

Datasets\Datasets2\disSim_Jaccard.mat

Disease similarity matrix in this database

Datasets\Datasets2\lncSim.mat

LncRNA similarity matrix in this database

Datasets\Datasets2\interMatrix.mat

LncRNA-Disease incident matrix in this database

Datasets\Datasets3\disease_Name

Disease names in this database

Datasets\Datasets3\lncRNA_Name

LncRNA names in this database

Datasets\Datasets3\disSim_Jaccard.mat

Disease similarity matrix in this database

Datasets\Datasets3\lncSim.mat

LncRNA similarity matrix in this database

Datasets\Datasets3\interMatrix.mat

LncRNA-Disease incident matrix in this database

Datasets\Dataset_2017\disease_similarity_score_2017.txt

Disease similarity matrix in this database

Datasets\Dataset_2017\diseaseNames.txt

Disease names in this database

Datasets\Dataset_2017\lncR_disease_association.txt

LncRNA-Disease incident matrix in this database

Datasets\Dataset_2017\lncR_similarity_score_2017.txt

LncRNA similarity matrix in this database

Datasets\Dataset_2017\lncRNANames_2017.txt

LncRNA names in this database

Datasets\Dataset_2017\disease_sim_2017.txt

Disease similarity matrix in this database

Datasets\Dataset_2017\lncR_disease_2017.txt

lncRNA-Disease incidence matrix in this database

Datasets\Dataset_2017\lncR_sim_2017.txt

lncRNA similarity matrix in this database

7. Contact

For any questions regarding our work, please feel free to contact us: alcs417@sdnu.edu.cn.