Code explanation

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| **Input data** | **Code** | **Function** | **Output data** |
|  | main\_svm.m | main script |  |
| GSE26712.xlsx | preprocess.m | preprocess noise | geneMat.mat、genename.mat |
| geneMat.mat、Catag.xlsx | BalanceData.m | data augment | NewGeneMat.mat、NewCatag.mat |
| NewGeneMat.mat、NewCatag.mat | DiviSVM.m | divide dataset | TrTe.mat (TrainMat.mat、TrainCata.mat、TestMat.mat、TestCata.mat) |
| TrainMat.mat、TrainCata.mat | yalmip\_SVM\_norm.m | train SVM | Aopt.mat、bopt.mat |
| Aopt.mat、bopt.mat、TrainMat.mat、TestMat.mat、TestCata.mat | findBeta.m | calculate contribution factor | beta.mat |
| NewGeneMat.mat、Surtime.xlsx、beta.mat | GetCoxData.m | Get training set and test set for Net-Cox | trainCoxMat.mat、trainCoxTime.mat、testCoxMat.mat、testCoxTime.mat |
| trainCoxMat.mat | Netconstruct.m | Get weighted adjacency matrix | S.mat |
|  | NetRank,m | sub-function for Netconstruct.m |  |
| trainCoxMat.mat、  train\_SurTime.mat | crossV.m | calculate hyperparameters for Net-Cox | slambda.mat、salpha.mat |
|  | CalPL.m | sub-function for crossV |  |
| trainCoxMat.mat、slambda.mat、  salpha.mat、S.mat、  train\_SurTime.mat | NetCox.m | calculate PCR for Net-Cox | bta.mat |
| bta.mat | selectBta.m | select gene signature and corresponding PCR | sele\_bta.mat、geneSig.mat |
| test\_SurTime.mat、sele\_bta.mat、testCoxMat.mat | DiviGroup.m | divided HR and LR in test set | Group1.mat,Group2.mat,min\_p.mat |
|  | logrank.m | sub-function for DiviGroup.m to calculate p-value |  |
|  | kmplot.m | sub-function for DiviGroup.m to get K-M curve |  |
| sele\_bta.mat、testCoxMat.mat、test\_SurTime.mat | CalAuc.m | calculate AUC、Se、Sp and ROC | AUC\_SE\_SP.mat |
| SigExp.xlsx | OvUnGene\_RD.m | calculate RD for gene signatures | RD.mat |

Data explanation

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| **数据名称** | **数据内容** |
| GSE26712.xlsx（GSE26712\_I.xlsx + GSE26712\_II） | original data |
| geneMat.mat、genename.mat | Gene expression、Gene name |
| Catag.xlsx | information for groups |
| NewGeneMat.mat、NewCatag.mat | expression and groups of samples after augment |
| TrTe.mat | data in training set and test set for SVM |
| Aopt.mat、bopt.mat | parameters of SVM |
| beta.mat | contribution factor of gene features |
| Surtime.xlsx | survival time |
| CoxTrTe.mat (trainCoxMat.mat、trainCoxTime.mat、  testCoxMat.mat、testCoxTime.mat) | gene expression and survival time of training set and test set for Net-Cox |
| S.mat | weighted adjacency matrix |
| slambda.mat、salpha.mat | hyper parameter of Net-Cox |
| bta.mat | PCR of Net-Cox |
| sele\_bta.mat | PCR of gene signatures |
| geneSig.mat | gene signatures |
| Group1.mat,Group2.mat,min\_p.mat | survival time and p-value for HR and LR sample |
| AUC\_SE\_SP.mat | AUC、SE、SP |
| SigExp.xlsx | expression of gene signature |
| RD.mat | RD of gene signatures |