11.1_STRINGweighted_CTS_cardiac_network.R

Inputs:
- BioTIP.res.RData (data)
- sce_E.825_uncorrected.RData (data)
- 10090.protein.aliases.v12.0.txt.gz (data/PPIN)
- 10090.protein.info.v12.0.txt.gz (data/PPIN)
- 10090.protein.links.v12.0.txt.gz (data/PPIN)

Outputs:
- DEG_perState_min.prop0.25_lfc0.6_FDFR0.05.rds (data)
- markers.up_all_ttest.rds (data)
- markers.up_ttest_min.prop0.25.rds (data)
- GSE87038_STRING_graph_perState_notsimplified.rds (results)

11.1.1_check_vertex_duplication.R

Inputs:
- GSE87038_STRING_graph_perState_notsimplified.rds (results)
- DEG_perState_min.prop0.25_lfc0.6_FDFR0.05.rds (data)
- 10090.protein.aliases.v12.0.txt.gz (data/PPIN)
- 10090.protein.info.v12.0.txt.gz (data/PPIN)
- 10090.protein.links.v12.0.txt.gz (data/PPIN)

Outputs:
- correct_n_edges_HiG_STRING2.14.0.rds (results)

11.2.1_CTS_cardiac_network_degreeDistribution.R

Inputs:
- GSE87038_STRING_graph_perState_notsimplified.rds (results)
- correct_n_edges_HiG_STRING2.14.0.rds (results)

Outputs:
- degree_distribution_w_vsize.pdf (results)
- normalized_degree_distribution.pdf (results)
- degree_GSE87038.pdf (results)
- boxplot_normalized_degree_GSE87038.pdf (results)
- V_deg_dis.rds (results)

11.2.0_update_network_weights_clean_max.R

Inputs:
- sce_E.825_uncorrected.RData (data)
- GSE87038_STRING_graph_perState_notsimplified.rds (results)
- correct_n_edges_HiG_STRING2.14.0.rds (results)

Dependencies:
- celltype_specific_weight_v9.R (code)
- BioTIP_update_06162025.R (code)

Outputs:
- network_specificity_list.rds (results/PPI_<max>weight)
- GSE87038_STRING_graph_perState_simplified_combinedweighted.rds (results/PPI_<max>weight)
- GSE87038_STRING_graph_perState_simplified_ratioweighted.rds (results/PPI_<max>weight)
- GSE87038_STRING_graph_perState_simplified_zscoreweighted.rds (results/PPI_<max>weight)
- GSE87038_STRING_graph_perState_simplified_diffweighted.rds (results/PPI_<max>weight)
- compare_specificity_method_vs_PPIscores.pdf (results/PPI_<max>weight)
- compare_specificity_method_HiGCTS_8_vs_PPIscores.pdf (results/PPI_<max>weight)

11.2.1_CTS_cardiac_network_strengthDistribution.R

Inputs:
- sce_E.825_uncorrected.RData (data)
- GSE87038_STRING_graph_perState_notsimplified.rds (results)
- correct_n_edges_HiG_STRING2.14.0.rds (results)

Dependencies:
- celltype_specific_weight_v9.R (code)

Outputs:
- strength_distribution_w_vsize.pdf (results)
- normalized_strength_distribution.pdf (results)
- strength_GSE87038.pdf (results)
- boxplot_normalized_strength_GSE87038.pdf (results)

11.2.1_weighted_network_robustness.simulation.R (requires High Performance Computing)

Inputs:

- GSE87038_STRING_graph_perState_simplified_combinedweighted.rds (results/PPI_<max>weight)

Dependencies:

- celltype_specific_weight_v9.R (code)

Outputs:

- failure.edge_100_simplified_combinedweighted.rds (results/PPI_<max>weight)
- failure.vertex_100_simplified_combinedweighted.rds (results/PPI_<max>weight)
- AUC_compt.pct_attac_V_random_1000runs_combinedweighted.rds (results/PPI_<max>weight)
- AUC_compt.pct_attac_E_random_1000runs_combinedweighted.rds (results/PPI_<max>weight)

11.2_CTS_cardiac_network_robustness.R (requires High Performance Computing)

Inputs:

- GSE87038_STRING_graph_perState_simplified_combinedweighted.rds (results/PPI_<max>weight)
- failure.vertex_100_simplified_combinedweighted.rds (results/PPI_<max>weight)
- failure.edge_100_simplified_combinedweighted.rds (results/PPI_<max>weight)
- AUC_compt.pct_attac_V_random_1000runs_combinedweighted.rds (results/PPI_<max>weight)
- AUC_compt.pct_attac_E_random_1000runs_combinedweighted.rds (results/PPI_<max>weight)

Dependencies:

- celltype_specific_weight_v9.R (code)

Outputs:

- vertex_attack_GSE87038.pdf (results/PPI_<max>weight)
- attack.vertex.btwn.rds (results/PPI_<max>weight)
- attack.edge.btwn.rds (results/PPI_<max>weight)
- attack_GSE87038.pdf (results/PPI_<max>weight)
- box_wilcox-test_attack_GSE87038.pdf (results/PPI_<max>weight)
- line.adjp_wilcox_attack_GSE87038.pdf (results/PPI_<max>weight)
- box_wilcox-test_attack_AUC_GSE87038.pdf (results/PPI_<max>weight)
- Vertex_All_AUC_density_plots.pdf (results/PPI_<max>weight)

- Edge_All_AUC_density_plots.pdf (results/PPI_<max>weight)

11.3_CTS_cardiac_network_ANND_pagerank.R

Inputs:
- GSE87038_STRING_graph_perState_simplified_combinedweighted.rds (results/PPI_<max>weight)
- CHD_Cilia_Genelist.rds (data)

Outputs:
- GSE87038_PageRank_Pvalue_by_rewiring.rds (results/PPI_<max>weight)
- GSE87038_annd_Pvalue_by_rewiring.rds (results/PPI_<max>weight)
- df_PAGERANK_strength_ANND.rewring.P.rds (results/PPI_<max>weight)
- df_PAGERANK_strength_ANND.rewring.P.tsv (results/PPI_<max>weight)
- df_betweeness.tsv (results/PPI_<max>weight)
- table_top5_Betweenness_perPPI.tsv (results/PPI_<max>weight)
- BetweennessCentrality_GSE87038_v2.pdf (results/PPI_<max>weight)
- table_top5_PageRank_perPPI.tsv (results/PPI_<max>weight)
- PageRank_GSE87038_v2.pdf (results/PPI_<max>weight)
- annd_GSE87038_v2.pdf (results/PPI_<max>weight)
- normalized.node.strength_GSE87038_v2.pdf (results/PPI_<max>weight)
- gene_ranked_by_importance_dotBoxPlot_6panel.pdf (results/PPI_<max>weight)

11.5_visualization.R

Inputs:
- GSE87038_STRING_graph_perState_simplified_combinedweighted.rds (results/PPI_<max>weight)
- GSE87038_STRING_graph_perState_notsimplified.rds (results)
- CHD_Cilia_Genelist.rds (data)

Outputs:
- network_view_PPI_GSE87038.pdf (results/PPI_<max>weight)
- network_HiG_view_weight_shrink_GSE87038.pdf (results/PPI_<max>weight)