

String_vs_sgd_vs_tflink

```
michaelvolk@M1-MV torchcell % /Users/michaelvolk/opt/miniconda3/envs/torchcell/bin/python /Users/michaelvolk/opt/miniconda3/envs/torchcell/bin/python -dmi-tmi/scripts/string_vs_sgd_vs_reg.py
/Users/michaelvolk/opt/miniconda3/envs/torchcell/lib/python3.11/site-packages/torch_geometric/typing.py:68:
  Referenced from: <B4DF21CE-3AD4-3ED1-8E22-0F66900D55D2> /Users/michaelvolk/opt/miniconda3/envs/torchcell/bin/python
  Reason: tried: '/Library/Frameworks/Python.framework/Versions/3.11/Python' (no such file), '/System/Volumes/ResourceStor
warnings.warn(f"An issue occurred while importing 'pyg-lib'. "
/Users/michaelvolk/opt/miniconda3/envs/torchcell/lib/python3.11/site-packages/torch_geometric/typing.py:12:
  Referenced from: <B4DF21CE-3AD4-3ED1-8E22-0F66900D55D2> /Users/michaelvolk/opt/miniconda3/envs/torchcell/bin/python
  Reason: tried: '/Library/Frameworks/Python.framework/Versions/3.11/Python' (no such file), '/System/Volumes/ResourceStor
warnings.warn(f"An issue occurred while importing 'torch-sparse'. "
Asset images will be saved to: /Users/michaelvolk/Documents/projects/torchcell/notes/assets/images
/Users/michaelvolk/Documents/projects/torchcell/data/go/go.obo: fmt(1.2) rel(2024-11-03) 43,983 Terms
```

==== Network Statistics ====

```
Regulatory: 3632 nodes, 9753 edges
Physical: 5721 nodes, 139463 edges
TFLink: 5092 nodes, 201898 edges
STRING12_Neighborhood: 2204 nodes, 147874 edges
STRING12_Fusion: 3095 nodes, 11810 edges
STRING12_Cooccurrence: 2615 nodes, 11115 edges
STRING12_Coexpression: 6503 nodes, 1002538 edges
STRING12_Experimental: 6036 nodes, 825101 edges
STRING12_Database: 4044 nodes, 73818 edges
```

==== Pairwise Comparison Results ====

Physical vs STRING12_Coexpression:

```
Network 1 edges: 139463
Network 2 edges: 1002538
Shared edges: 69946
Jaccard similarity: 0.0652
```

Physical vs STRING12_Cooccurrence:

```
Network 1 edges: 139463
Network 2 edges: 11115
Shared edges: 1005
Jaccard similarity: 0.0067
```

Physical vs STRING12_Database:

```
Network 1 edges: 139463
Network 2 edges: 73818
Shared edges: 11230
Jaccard similarity: 0.0556
```

Physical vs STRING12_Experimental:

```
Network 1 edges: 139463
Network 2 edges: 825101
Shared edges: 105034
Jaccard similarity: 0.1222
```

Physical vs STRING12_Fusion:

```
Network 1 edges: 139463
Network 2 edges: 11810
Shared edges: 788
Jaccard similarity: 0.0052
```

Physical vs STRING12_Neighborhood:

Network 1 edges: 139463
Network 2 edges: 147874
Shared edges: 4578
Jaccard similarity: 0.0162

Physical vs TFLink:

Network 1 edges: 139463
Network 2 edges: 200803
Shared edges: 2013
Jaccard similarity: 0.0060

Regulatory vs Physical:

Network 1 edges: 9745
Network 2 edges: 139463
Shared edges: 403
Jaccard similarity: 0.0027

Regulatory vs STRING12_Coexpression:

Network 1 edges: 9745
Network 2 edges: 1002538
Shared edges: 1050
Jaccard similarity: 0.0010

Regulatory vs STRING12_Cooccurrence:

Network 1 edges: 9745
Network 2 edges: 11115
Shared edges: 37
Jaccard similarity: 0.0018

Regulatory vs STRING12_Database:

Network 1 edges: 9745
Network 2 edges: 73818
Shared edges: 65
Jaccard similarity: 0.0008

Regulatory vs STRING12_Experimental:

Network 1 edges: 9745
Network 2 edges: 825101
Shared edges: 1244
Jaccard similarity: 0.0015

Regulatory vs STRING12_Fusion:

Network 1 edges: 9745
Network 2 edges: 11810
Shared edges: 11
Jaccard similarity: 0.0005

Regulatory vs STRING12_Neighborhood:

Network 1 edges: 9745
Network 2 edges: 147874
Shared edges: 27
Jaccard similarity: 0.0002

Regulatory vs TFLink:

Network 1 edges: 9745
Network 2 edges: 200803

Shared edges: 3577
Jaccard similarity: 0.0173

STRING12_Coexpression vs STRING12_Database:

Network 1 edges: 1002538
Network 2 edges: 73818
Shared edges: 57388
Jaccard similarity: 0.0563

STRING12_Coexpression vs STRING12_Experimental:

Network 1 edges: 1002538
Network 2 edges: 825101
Shared edges: 557632
Jaccard similarity: 0.4391

STRING12_Cooccurrence vs STRING12_Coexpression:

Network 1 edges: 11115
Network 2 edges: 1002538
Shared edges: 7119
Jaccard similarity: 0.0071

STRING12_Cooccurrence vs STRING12_Database:

Network 1 edges: 11115
Network 2 edges: 73818
Shared edges: 1184
Jaccard similarity: 0.0141

STRING12_Cooccurrence vs STRING12_Experimental:

Network 1 edges: 11115
Network 2 edges: 825101
Shared edges: 5660
Jaccard similarity: 0.0068

STRING12_Experimental vs STRING12_Database:

Network 1 edges: 825101
Network 2 edges: 73818
Shared edges: 40076
Jaccard similarity: 0.0467

STRING12_Fusion vs STRING12_Coexpression:

Network 1 edges: 11810
Network 2 edges: 1002538
Shared edges: 8601
Jaccard similarity: 0.0086

STRING12_Fusion vs STRING12_Cooccurrence:

Network 1 edges: 11810
Network 2 edges: 11115
Shared edges: 318
Jaccard similarity: 0.0141

STRING12_Fusion vs STRING12_Database:

Network 1 edges: 11810
Network 2 edges: 73818
Shared edges: 876
Jaccard similarity: 0.0103

STRING12_Fusion vs STRING12_Experimental:

Network 1 edges: 11810
Network 2 edges: 825101
Shared edges: 5960
Jaccard similarity: 0.0072

STRING12_Neighborhood vs STRING12_Coexpression:

Network 1 edges: 147874
Network 2 edges: 1002538
Shared edges: 120681
Jaccard similarity: 0.1172

STRING12_Neighborhood vs STRING12_Cooccurrence:

Network 1 edges: 147874
Network 2 edges: 11115
Shared edges: 287
Jaccard similarity: 0.0018

STRING12_Neighborhood vs STRING12_Database:

Network 1 edges: 147874
Network 2 edges: 73818
Shared edges: 22212
Jaccard similarity: 0.1113

STRING12_Neighborhood vs STRING12_Experimental:

Network 1 edges: 147874
Network 2 edges: 825101
Shared edges: 61904
Jaccard similarity: 0.0679

STRING12_Neighborhood vs STRING12_Fusion:

Network 1 edges: 147874
Network 2 edges: 11810
Shared edges: 1678
Jaccard similarity: 0.0106

TFLink vs STRING12_Coexpression:

Network 1 edges: 200803
Network 2 edges: 1002538
Shared edges: 16708
Jaccard similarity: 0.0141

TFLink vs STRING12_Cooccurrence:

Network 1 edges: 200803
Network 2 edges: 11115
Shared edges: 120
Jaccard similarity: 0.0006

TFLink vs STRING12_Database:

Network 1 edges: 200803
Network 2 edges: 73818
Shared edges: 576
Jaccard similarity: 0.0021

TFLink vs STRING12_Experimental:

Network 1 edges: 200803
Network 2 edges: 825101
Shared edges: 20035
Jaccard similarity: 0.0199

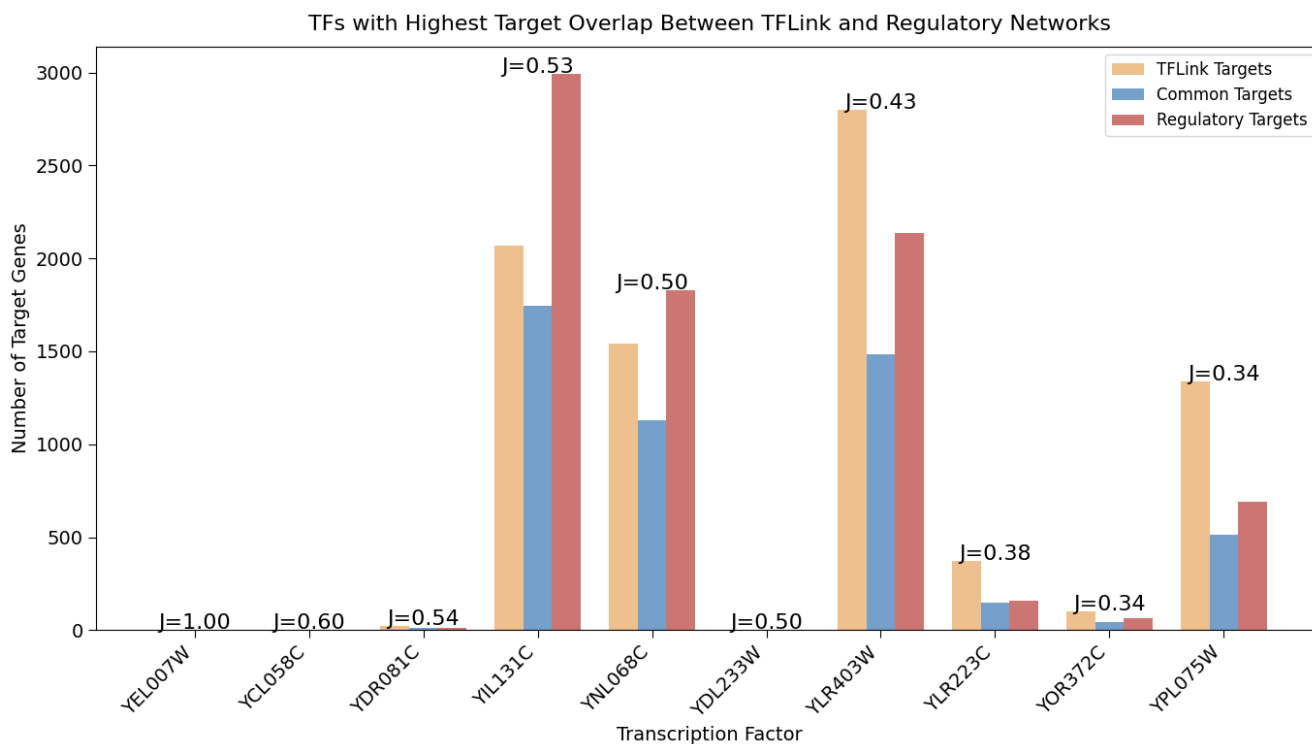
TFLink vs STRING12_Fusion:
 Network 1 edges: 200803
 Network 2 edges: 11810
 Shared edges: 60
 Jaccard similarity: 0.0003

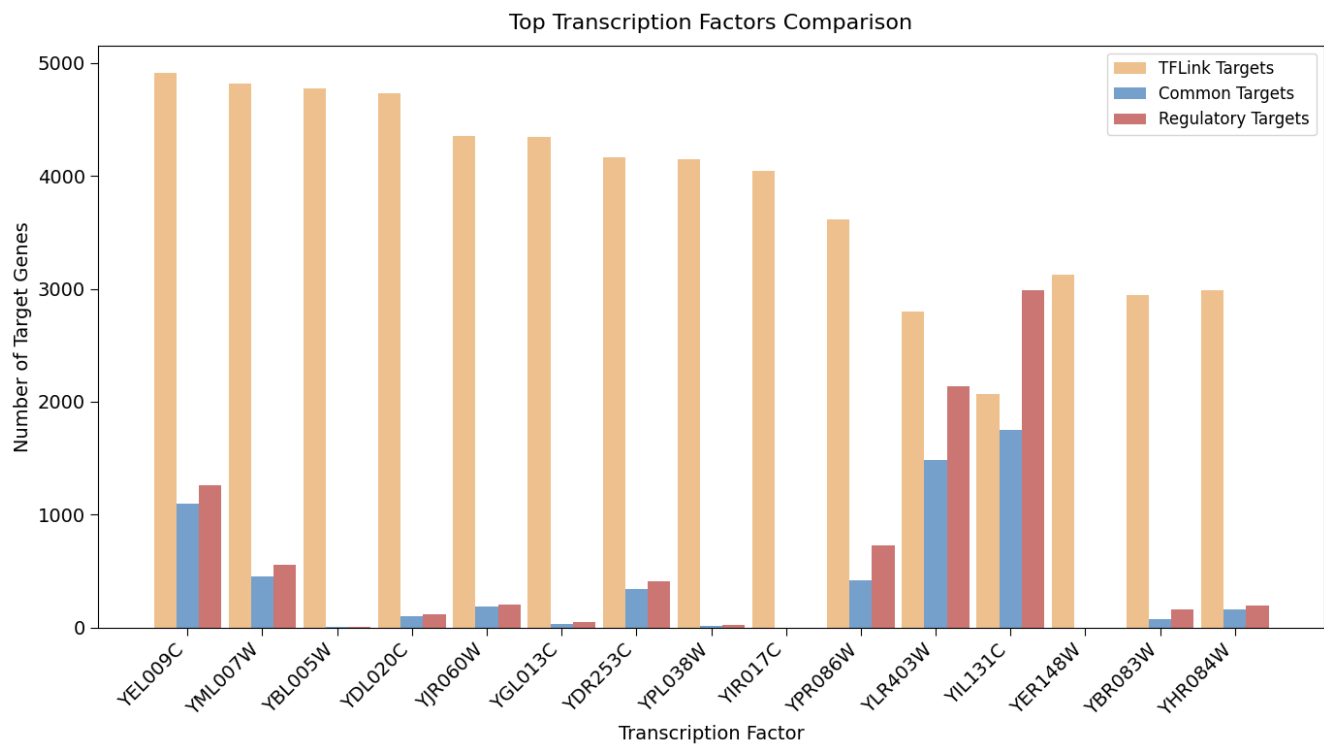
TFLink vs STRING12_Neighborhood:
 Network 1 edges: 200803
 Network 2 edges: 147874
 Shared edges: 414
 Jaccard similarity: 0.0012

==== Generating Visualizations ====

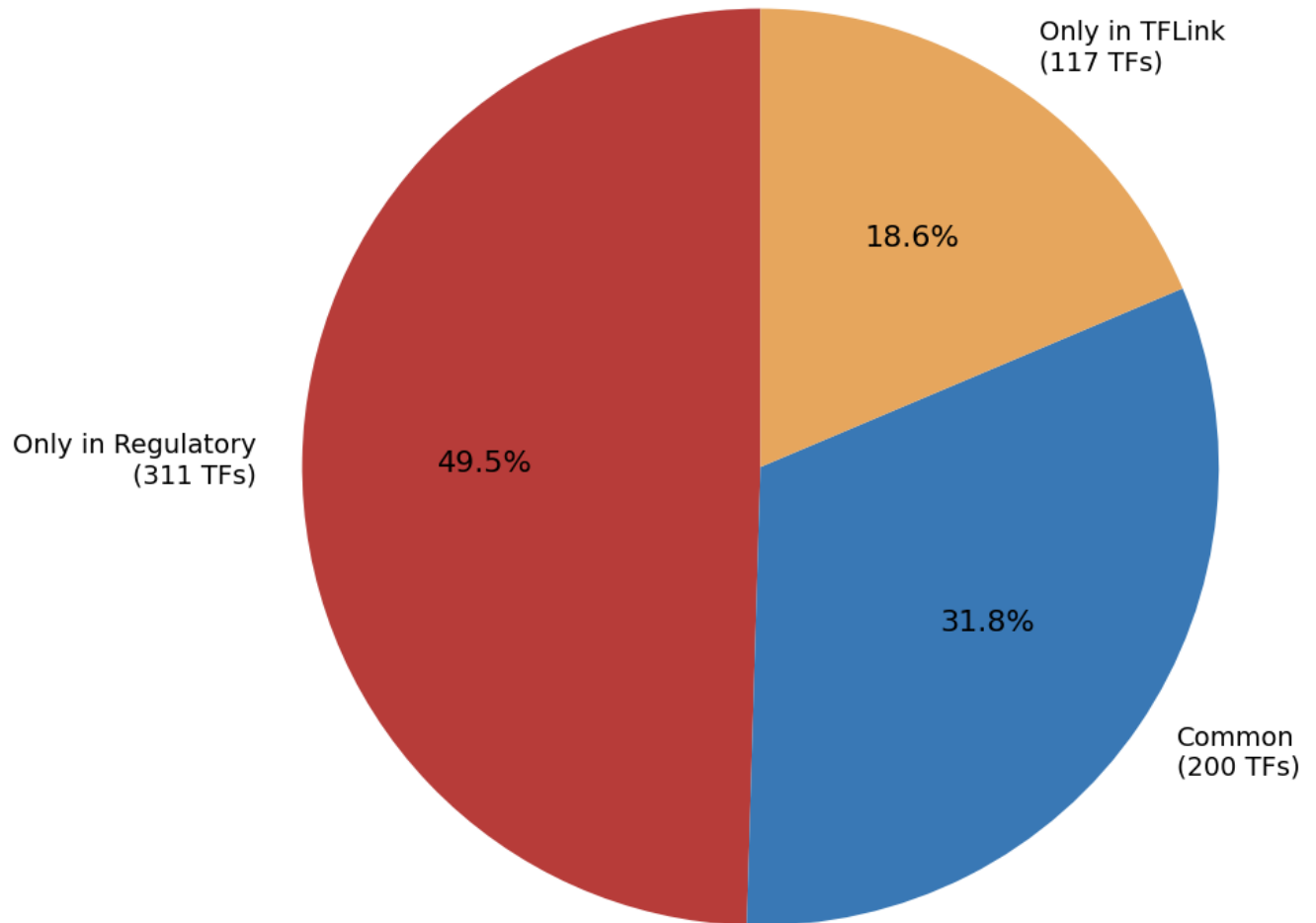
- Network sizes chart created
- Jaccard similarity heatmap created
- Edge overlap matrices created
- Network overlap charts created
- TF regulatory comparison visualizations created

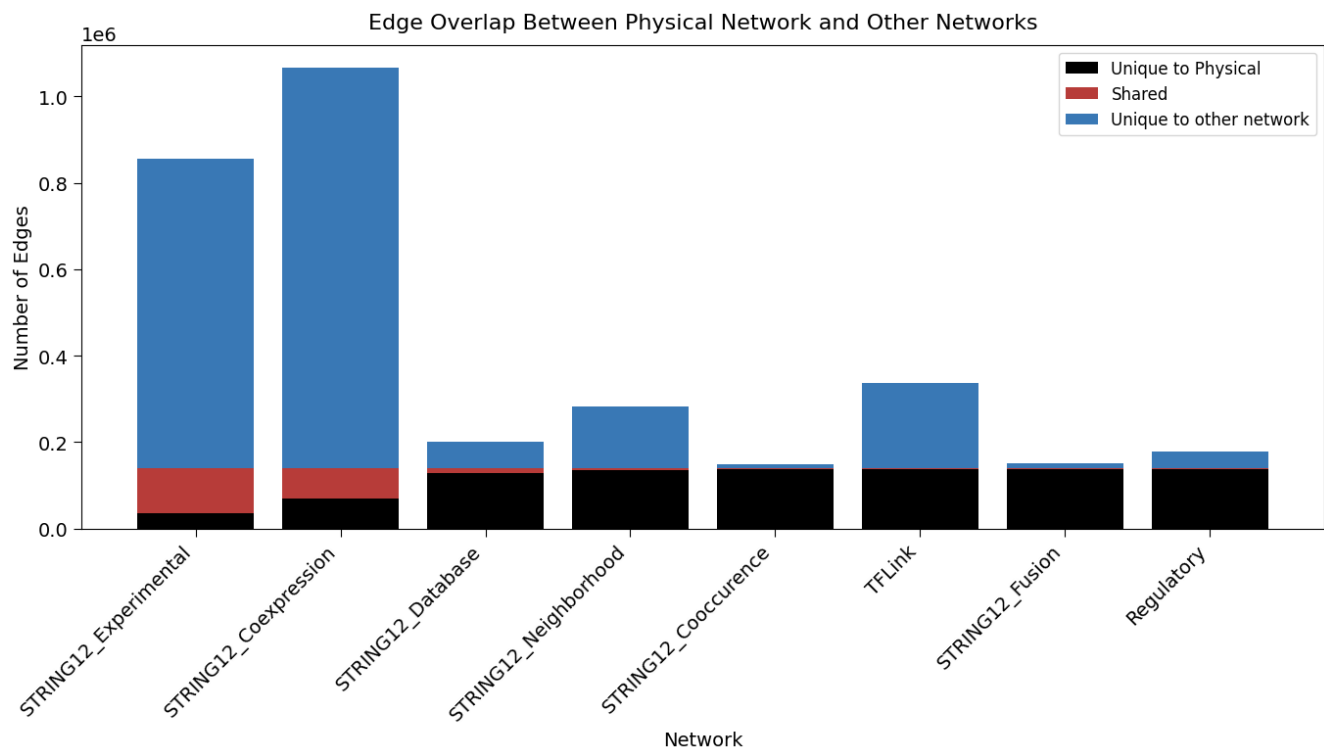
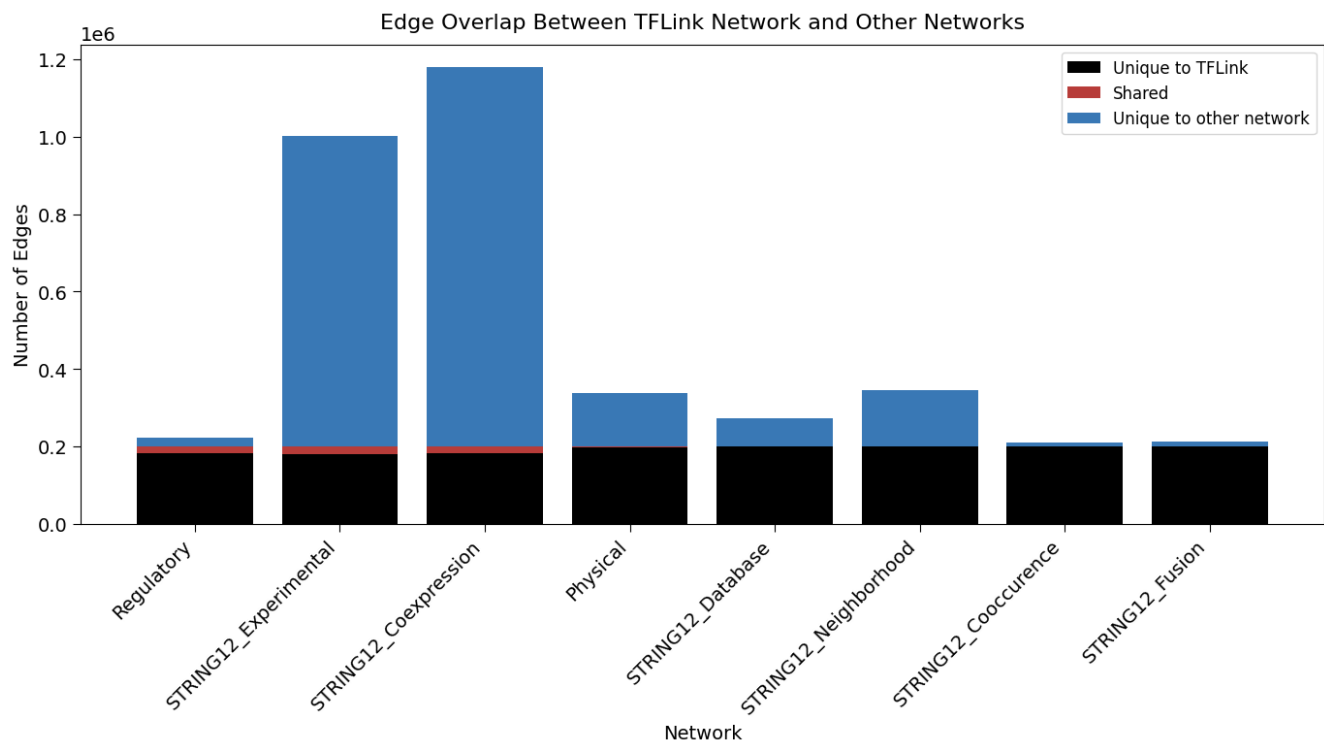
All visualizations saved to /Users/michaelvolk/Documents/projects/torchcell/notes/assets/images

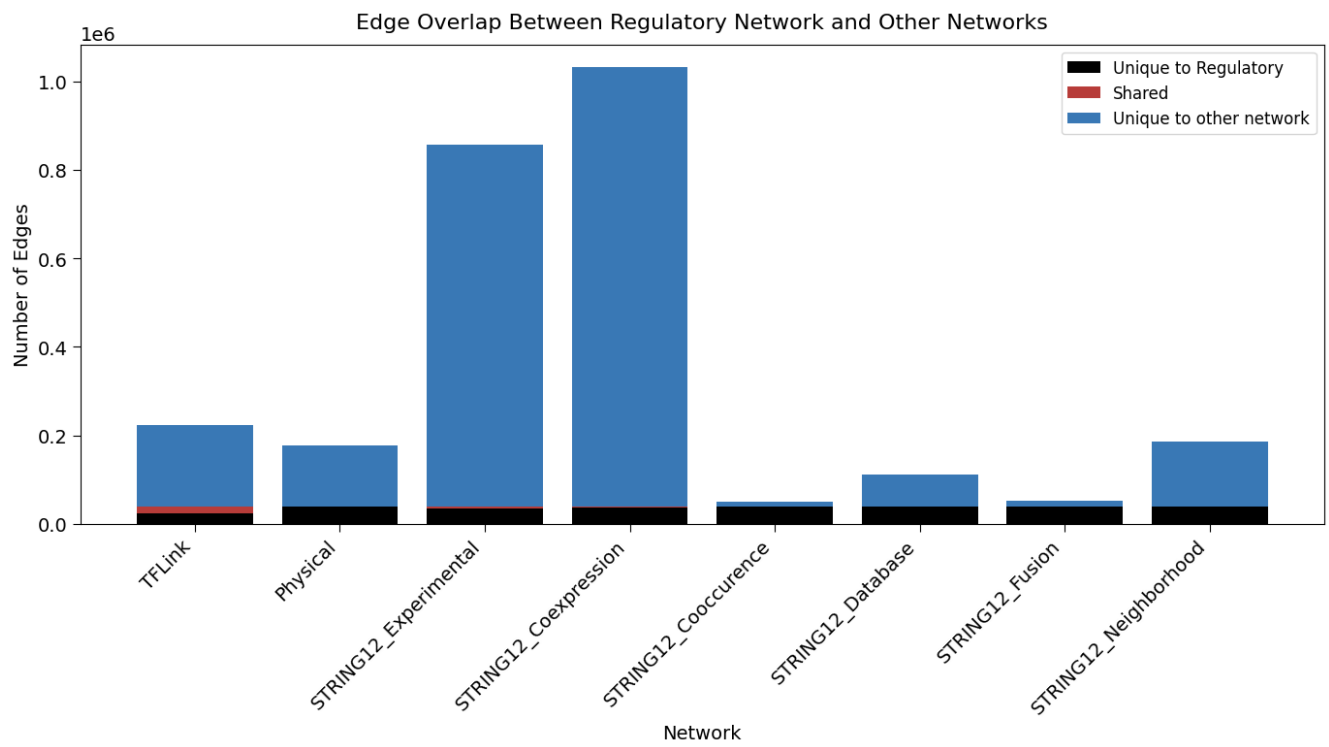


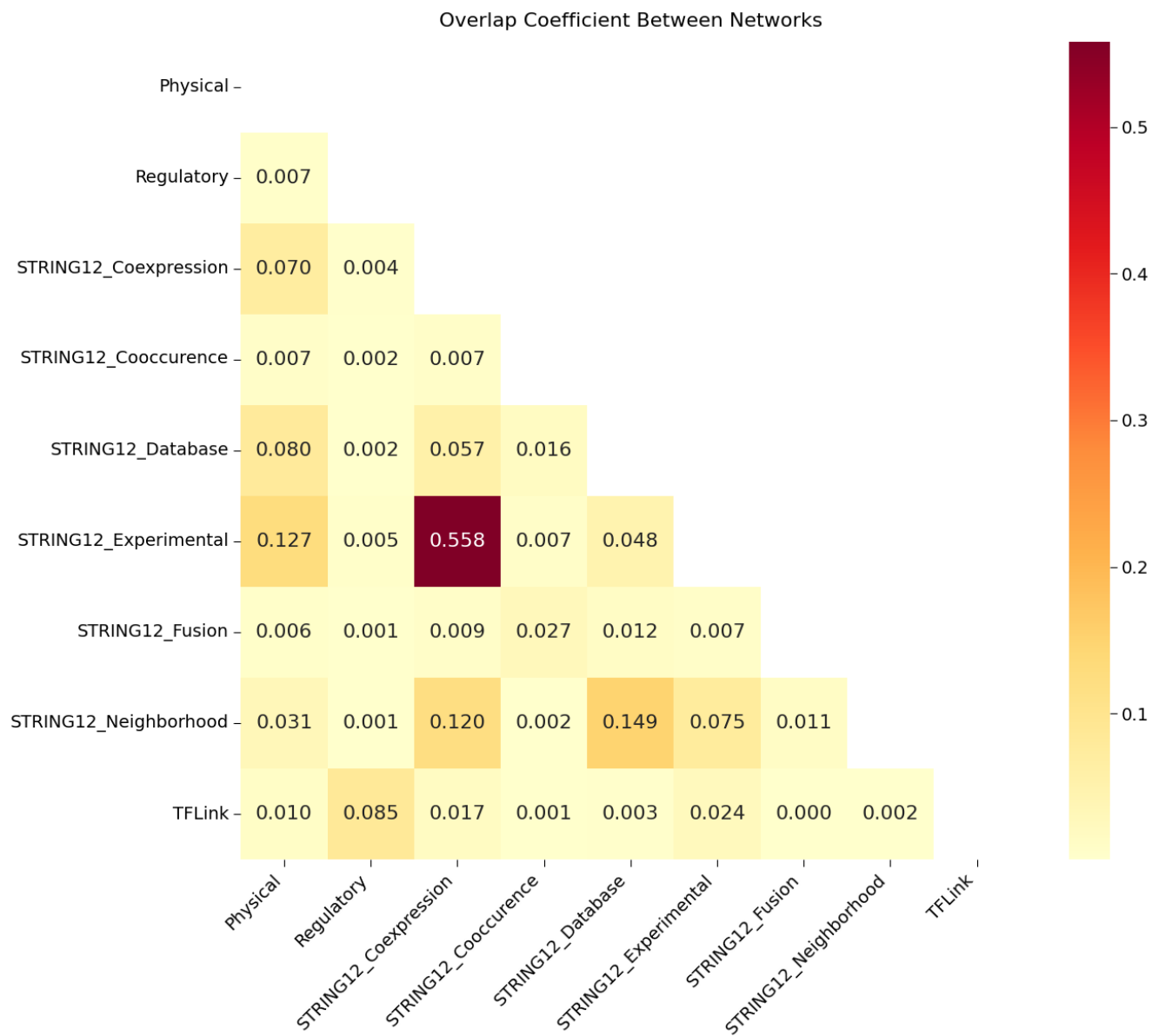


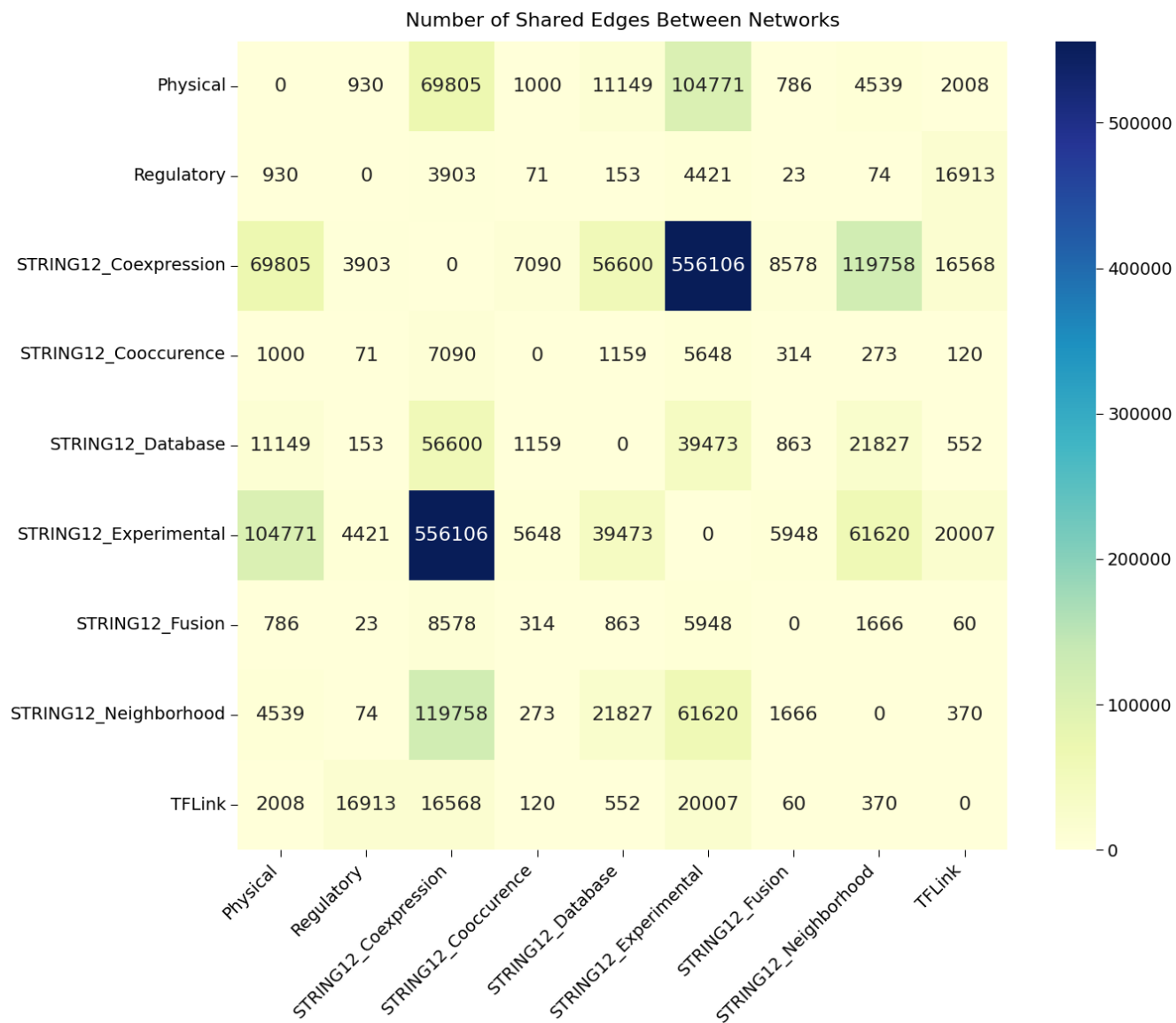
Transcription Factors Distribution Between Networks

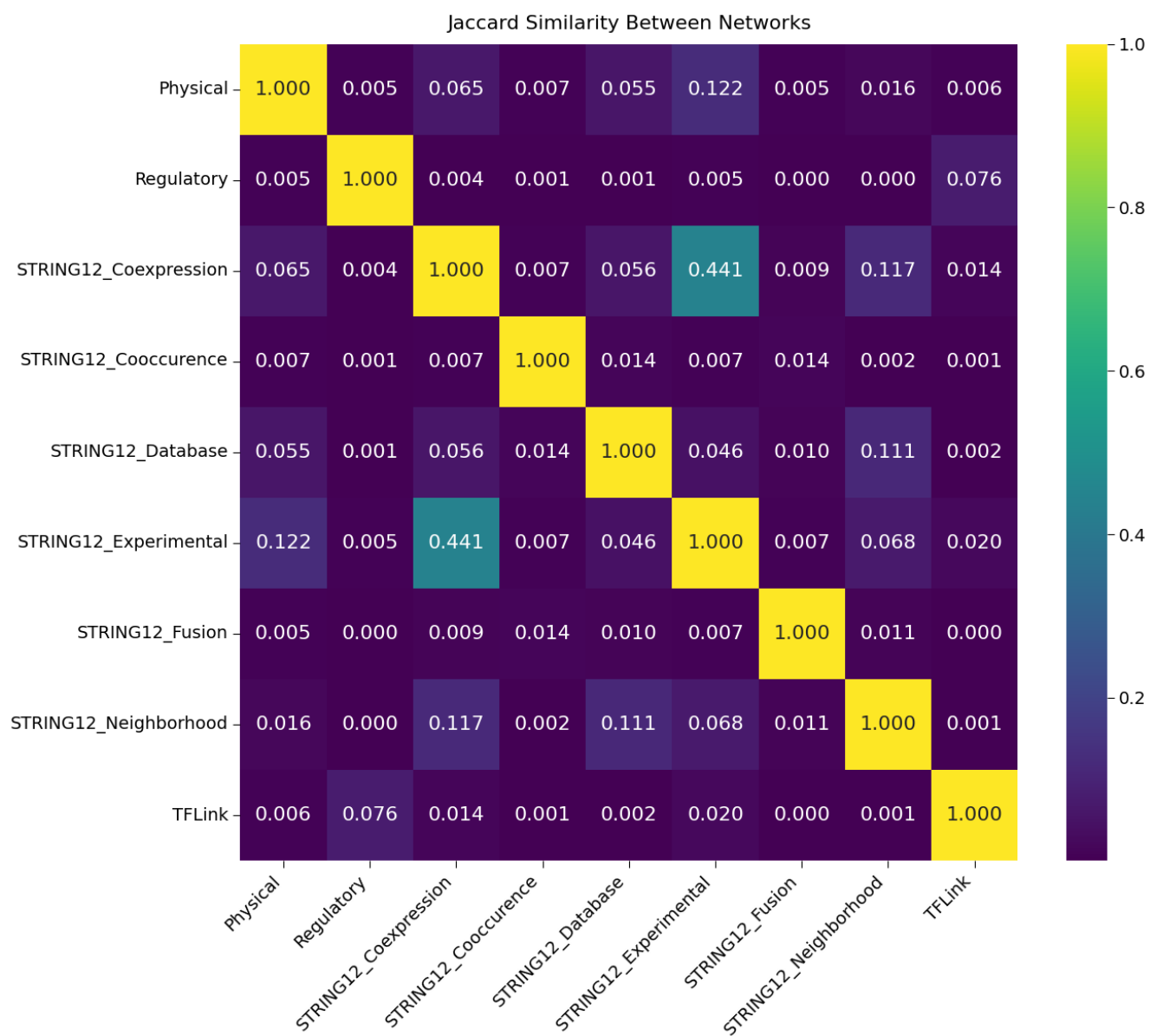


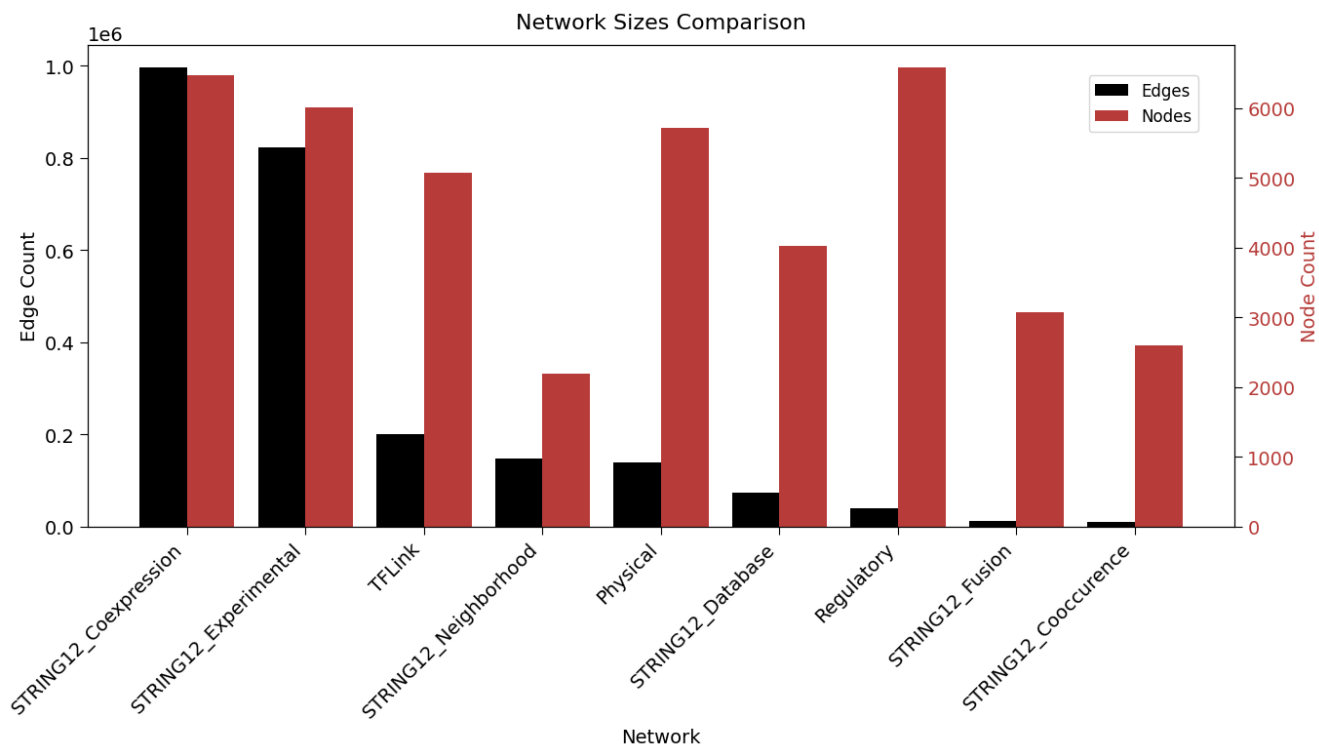












Network	Nodes	Edges
Regulatory	3,632	9,753
Physical	5,721	139,463
TFLink	5,092	201,898
STRING12_Neighborhood	2,204	147,874
STRING12_Fusion	3,095	11,810
STRING12_Cooccurrence	2,615	11,115
STRING12_Coexpression	6,503	1,002,538
STRING12_Experimental	6,036	825,101
STRING12_Database	4,044	73,818
Sum	38,942	2,423,370