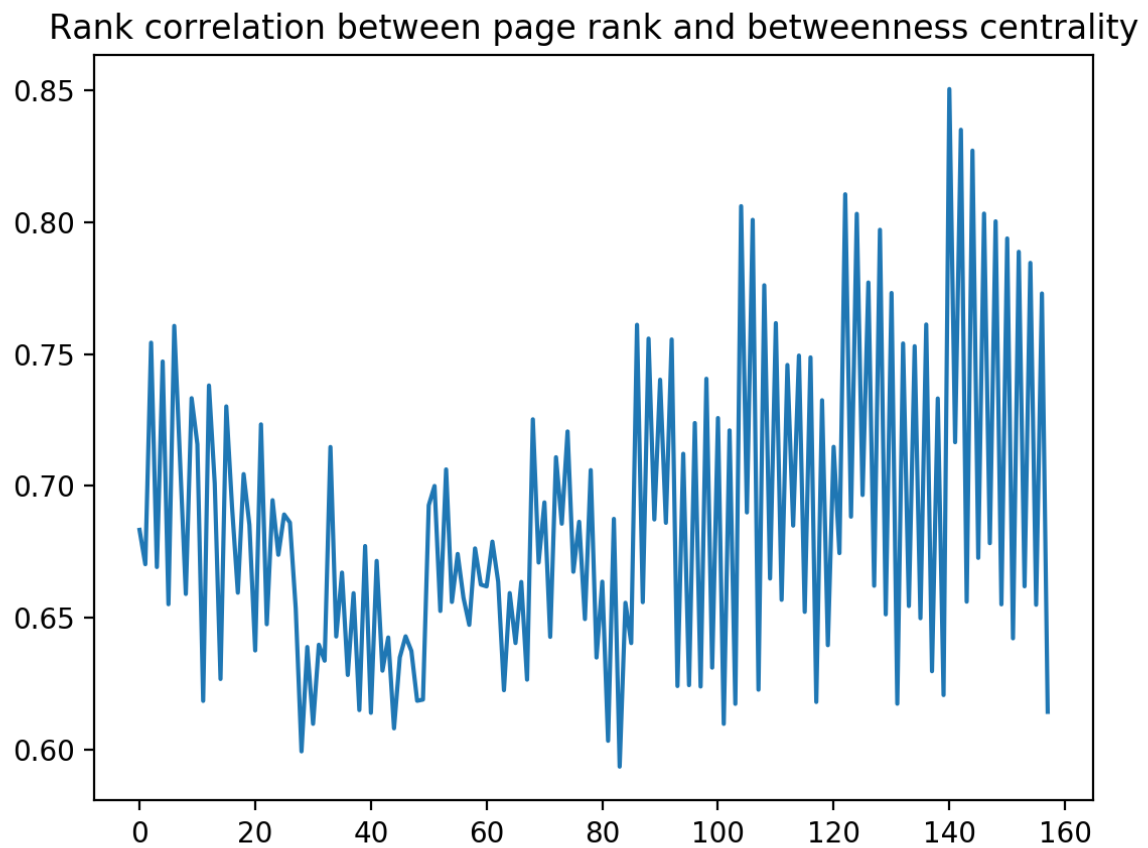


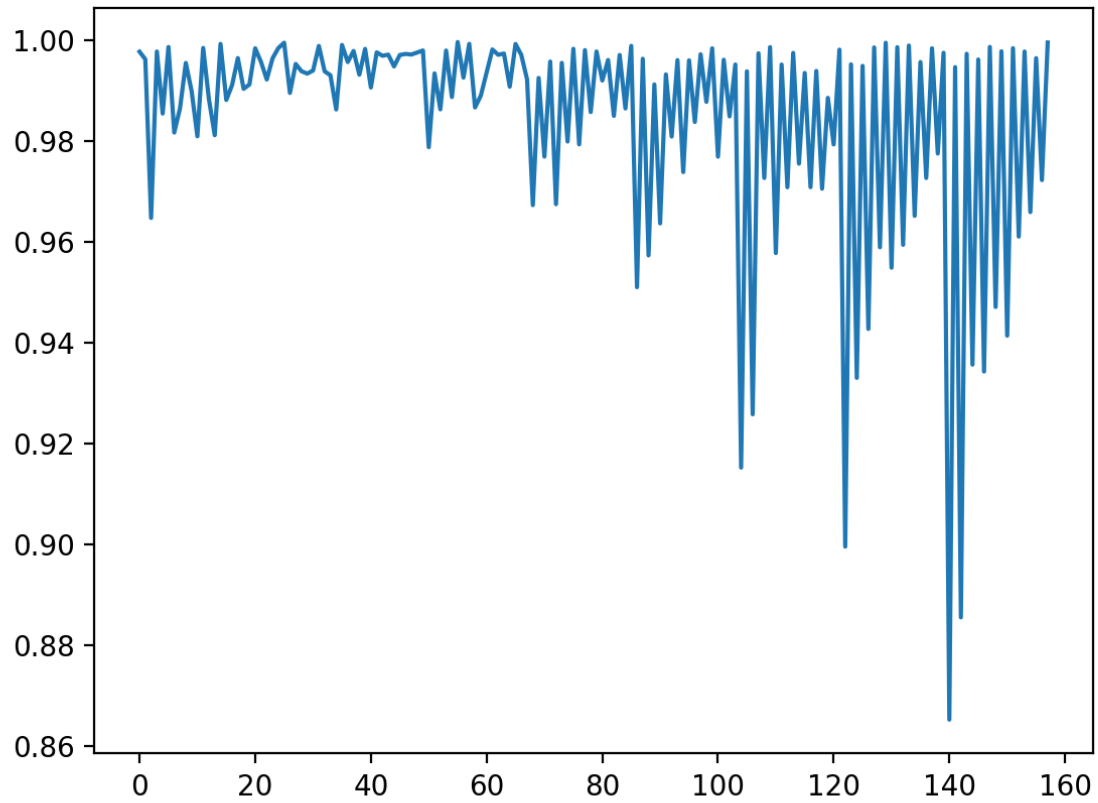
ReportIII

Luhuan Wu, Xiaohui Li

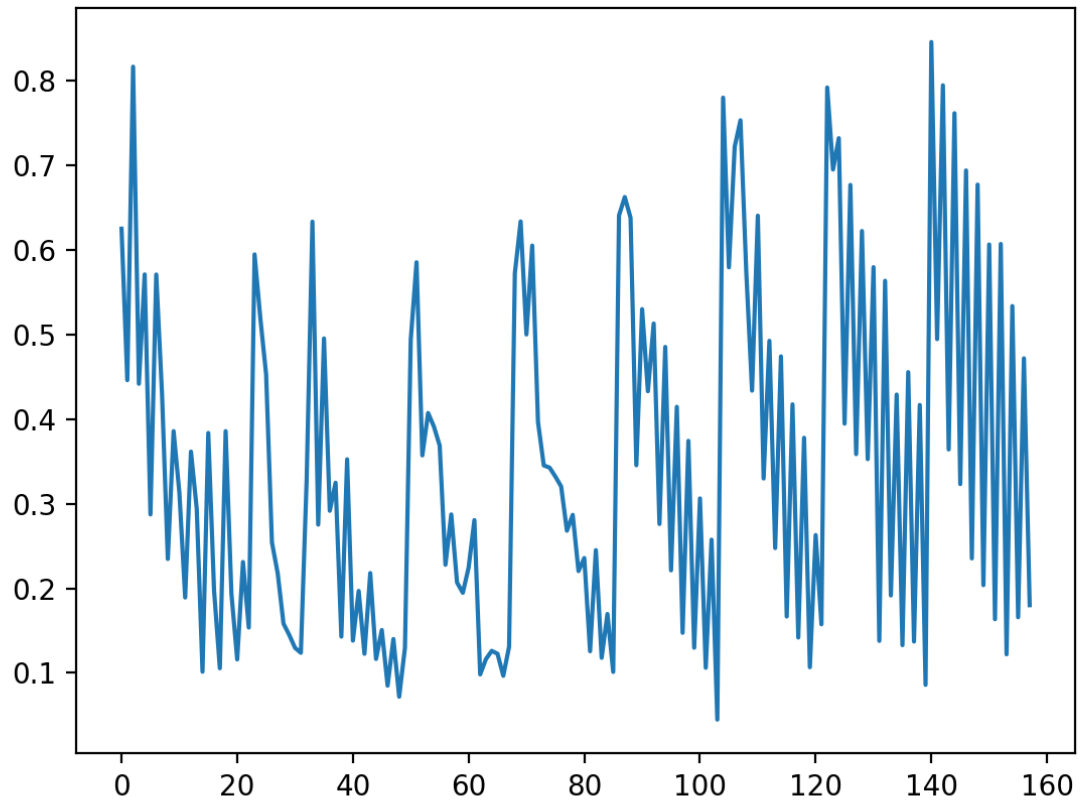
June 12, 2017



Correlation of in-degree sequence and out-degree sequence distribution



Correlation of in-degree sequence and out-degree sequence

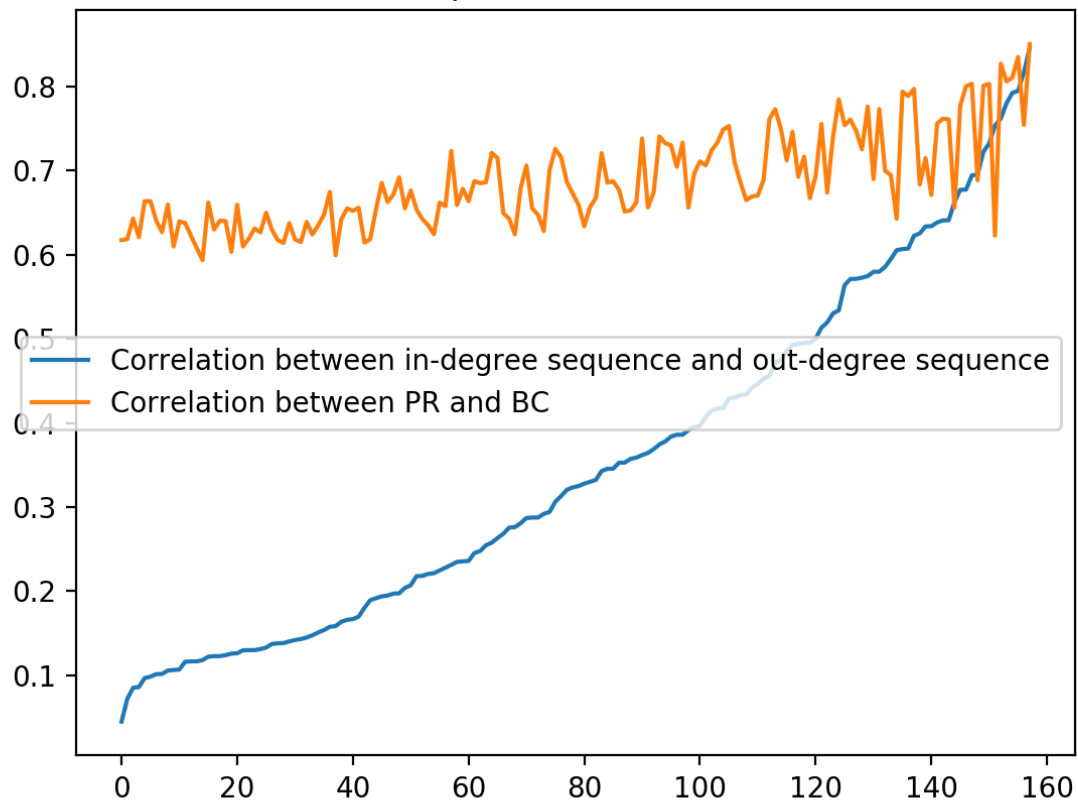


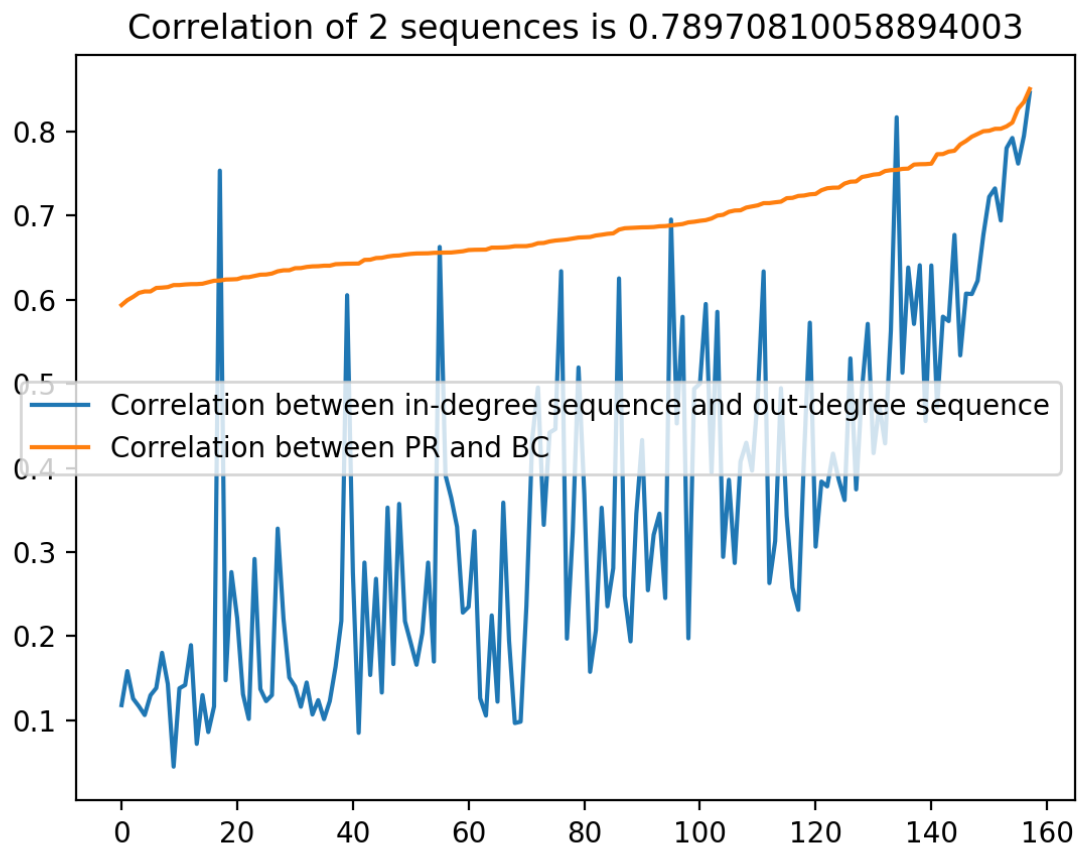
Rank_corr and degree_corr

Correlation between rank_corr and degree_corr is:

(0.78970810058894003, 6.3495361369322152e-35)

Correlation of 2 sequences is 0.78970810058894003





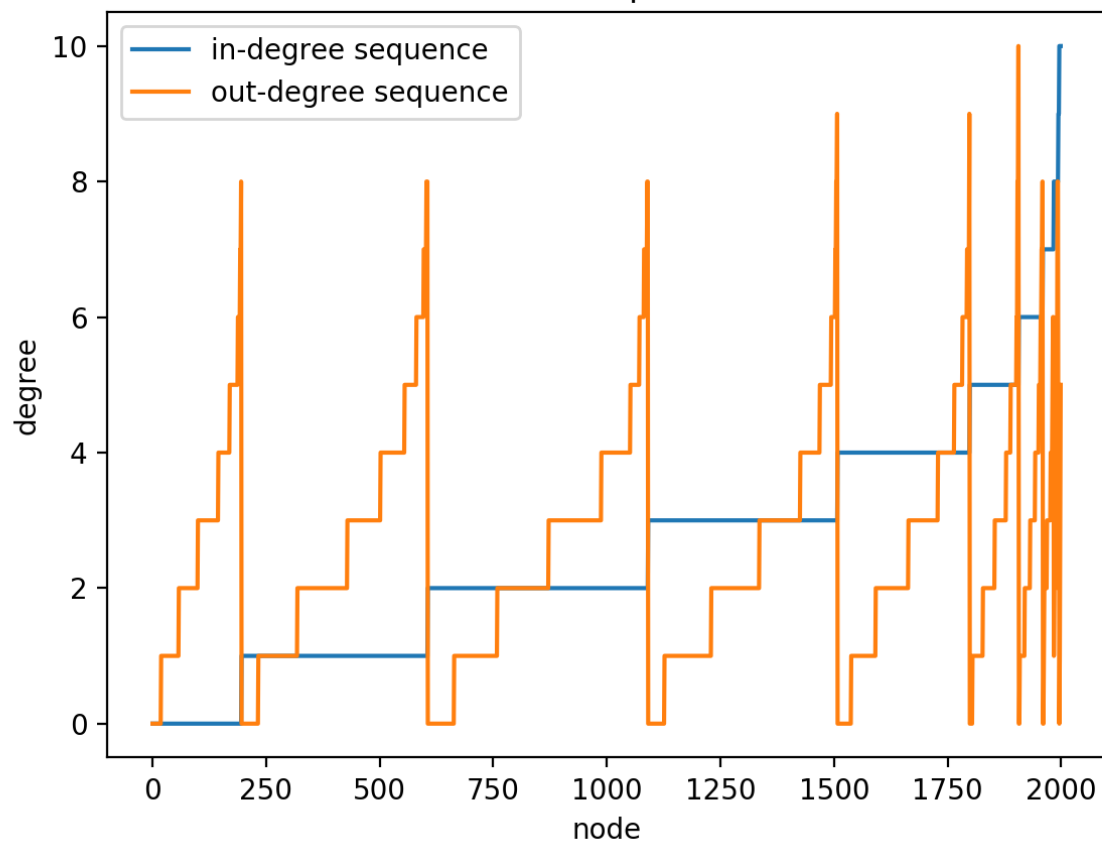
Model 103

The Least Correlation between in-degree sequence and out-degree sequence :

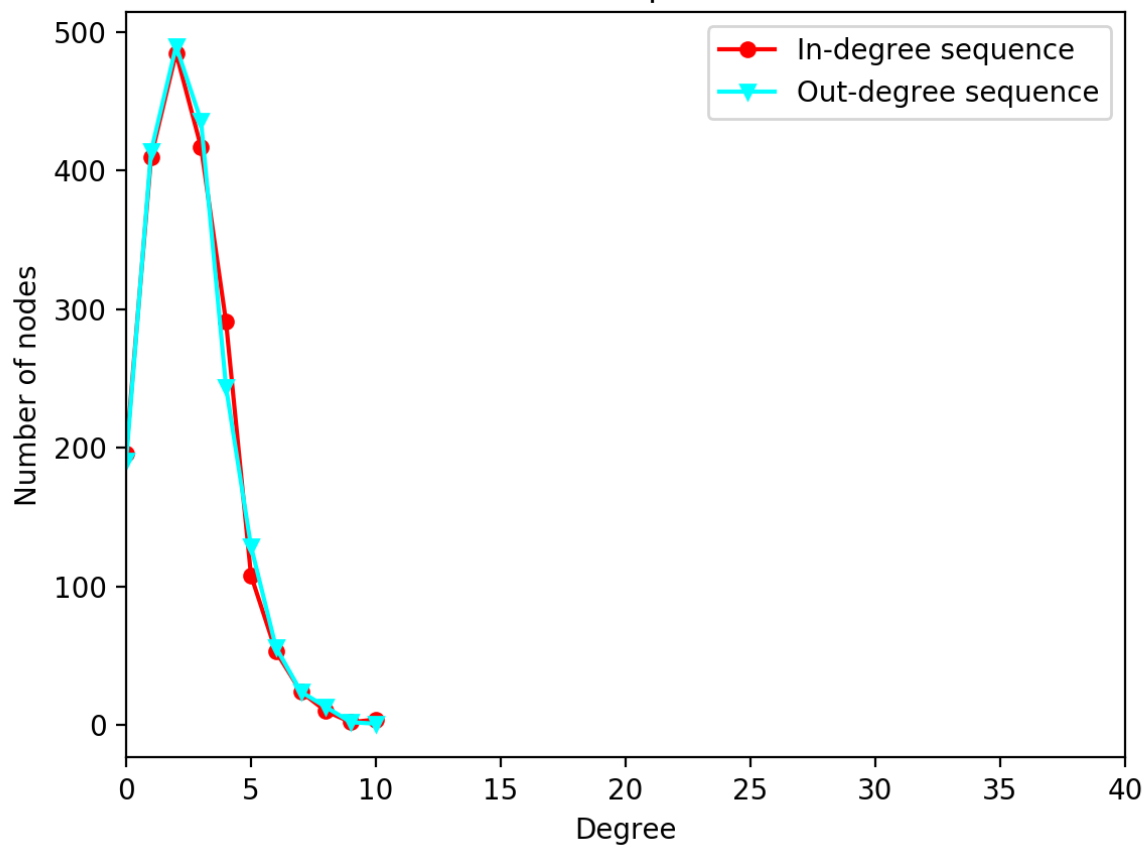
0.04471810534893543

Correlation: 0.04471810534893543 p-value: 0.045542989668963217

$a = 1.00$ $d = 1.00$ $\beta = 5.80$ $\alpha = 5.80$ $b = 2.00$ $c = 2.00$

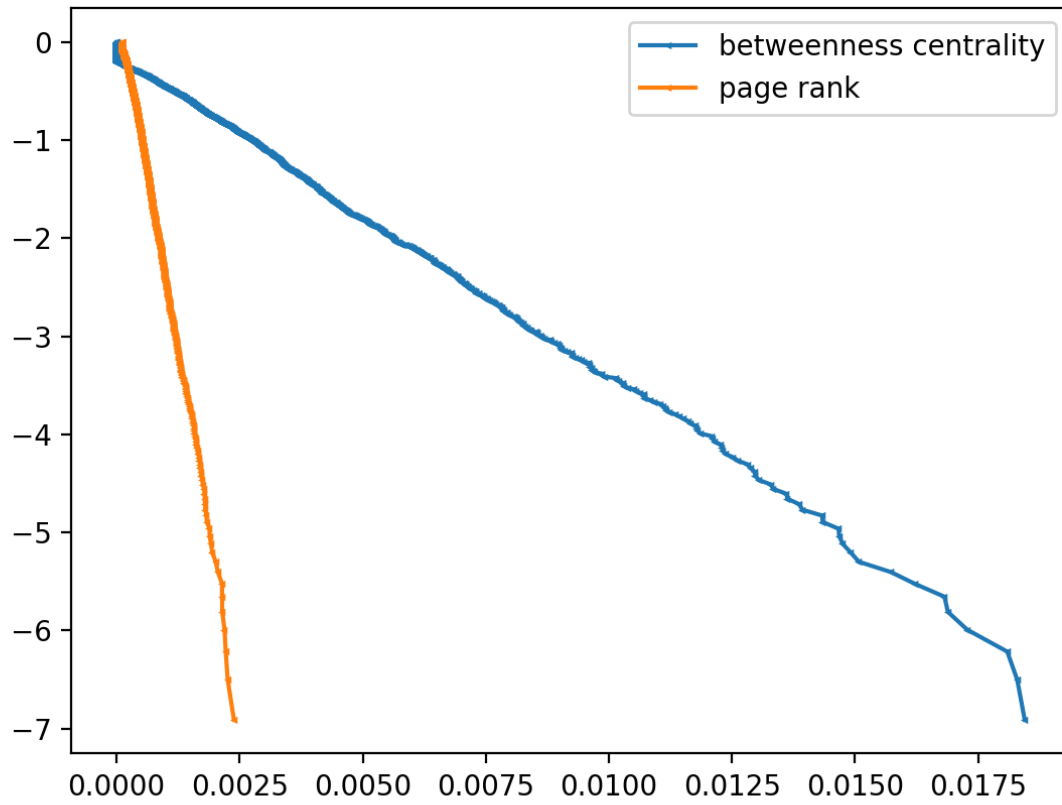


Correlation: 0.99521686806398157 p-value: 2.1044721308977512e-10
a = 1.00 d = 1.00 beta = 5.80 alpha = 5.80 b = 2.00 c = 2.00

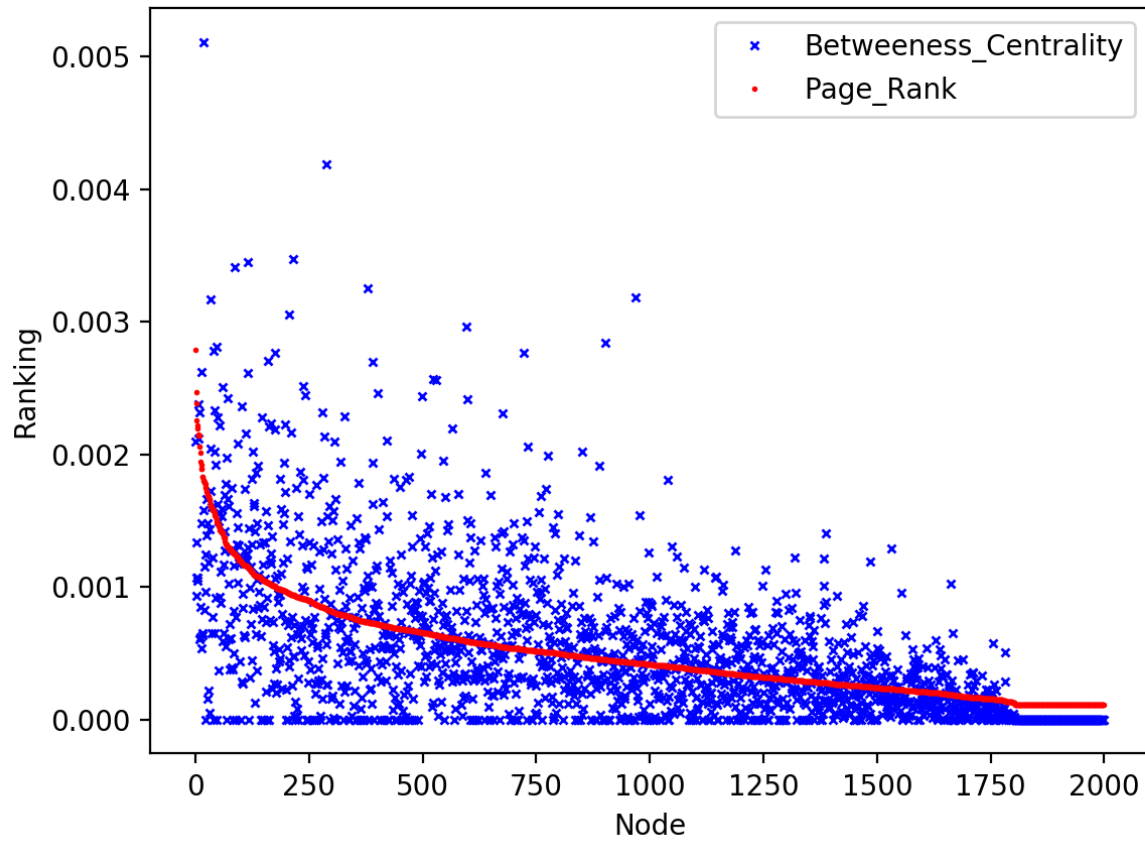


Log Tail distribution

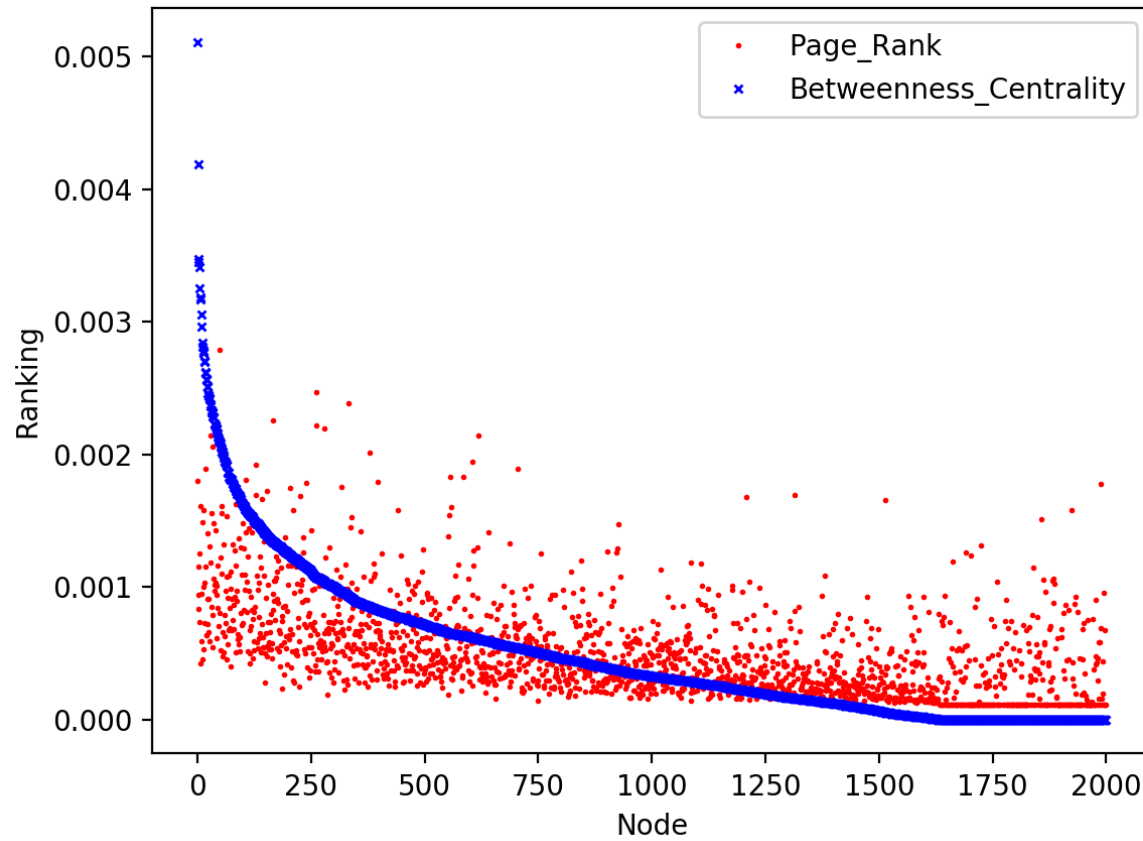
$a = 1.00$ $d = 1.00$ $\beta = 5.80$ $\alpha = 5.80$ $b = 2.00$ $c = 2.00$



First 2000 nodes in decreasing order of Page Rank
 $a = 1.00$ $d = 1.00$ $\beta = 5.80$ $\alpha = 5.80$ $b = 2.00$ $c = 2.00$



First 2000 nodes in decreasing order of Betweenness centrality
 $a = 1.00$ $d = 1.00$ $\beta = 5.80$ $\alpha = 5.80$ $b = 2.00$ $c = 2.00$



Spearsman's rank correlation test:

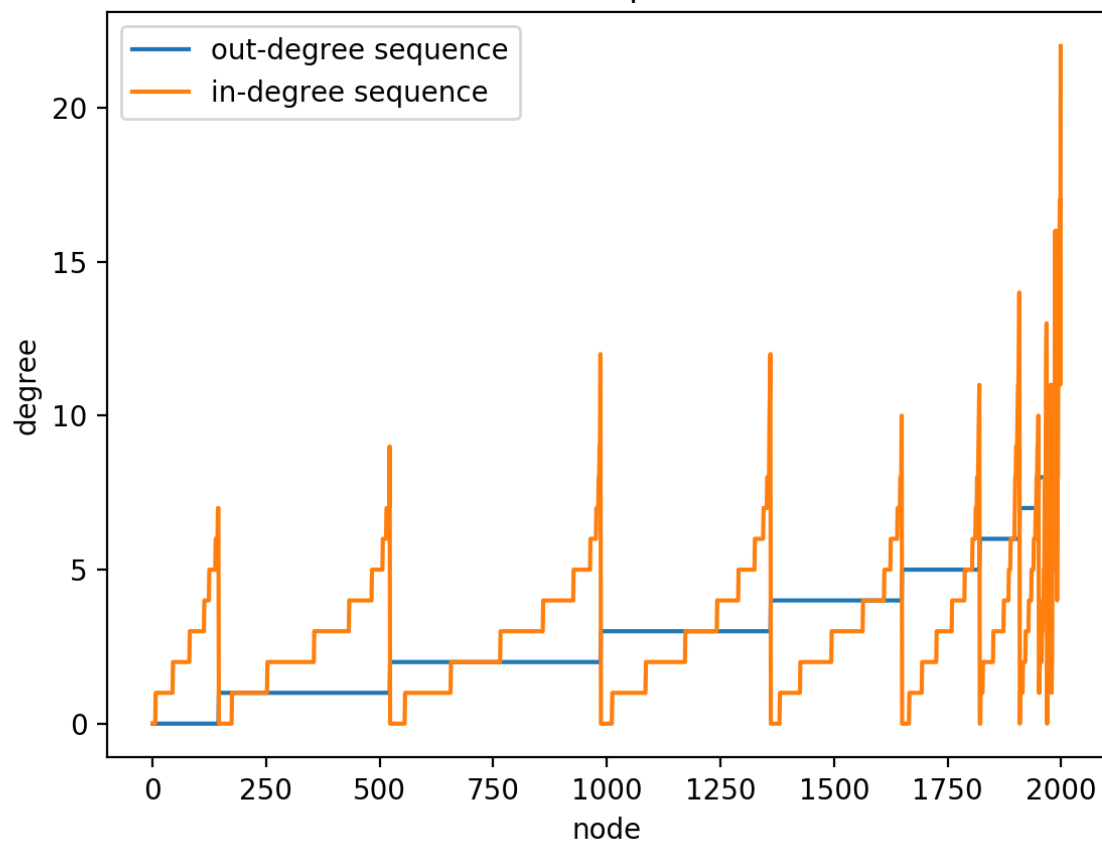
correlation = 0.61738611373679264, pvalue = 1.752035270814187e-210

Model 37

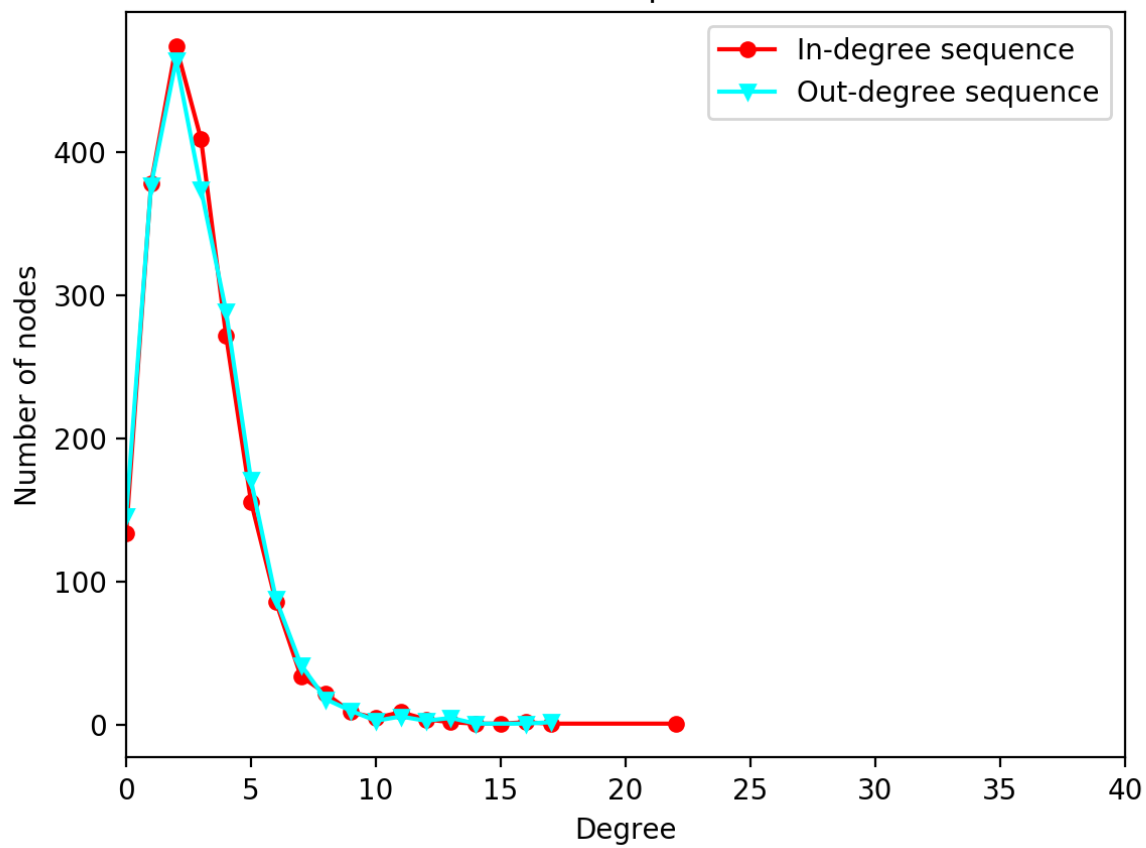
The median correlation between in-degree sequence and out-degree sequence:

0.32488658335085691

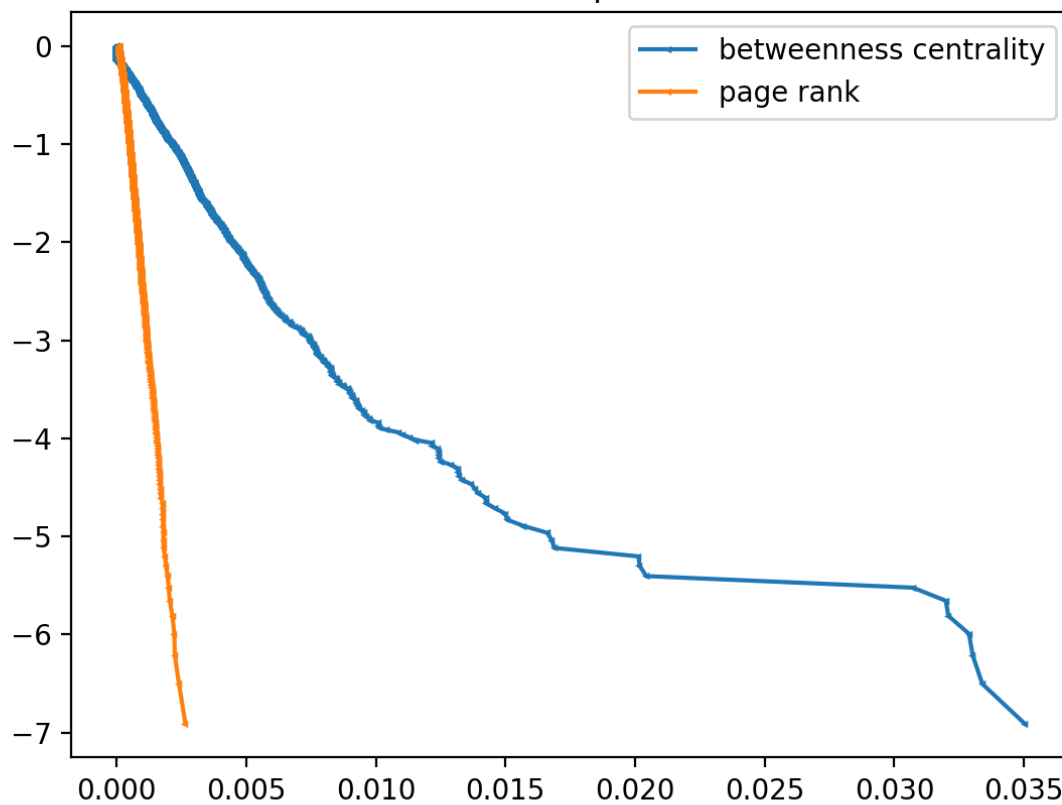
Correlation: 0.32488658335085691 p-value: 2.1974589592224318e-50
a = 1.00 d = 1.00 beta = 3.40 alpha = 3.40 b = 2.00 c = 2.00



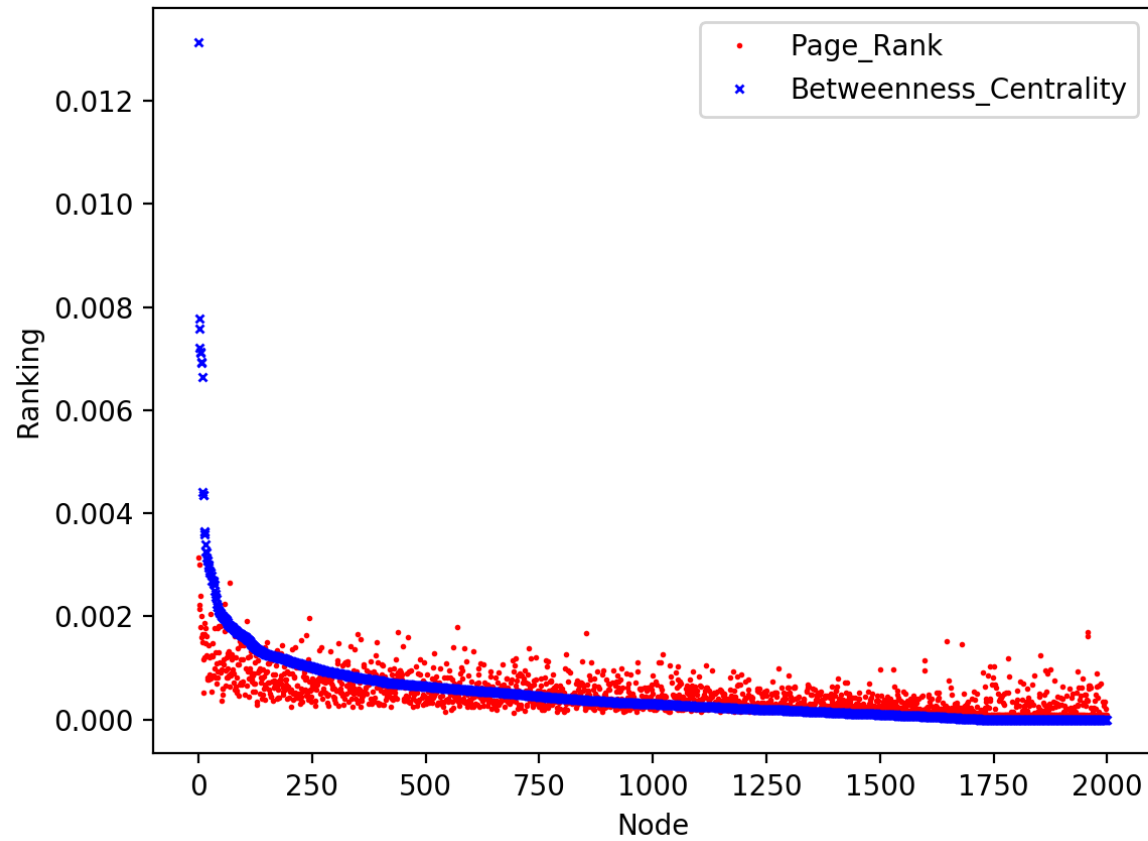
Correlation: 0.99790203298044999 p-value: 1.8681412694632511e-26
a = 1.00 d = 1.00 beta = 3.40 alpha = 3.40 b = 2.00 c = 2.00



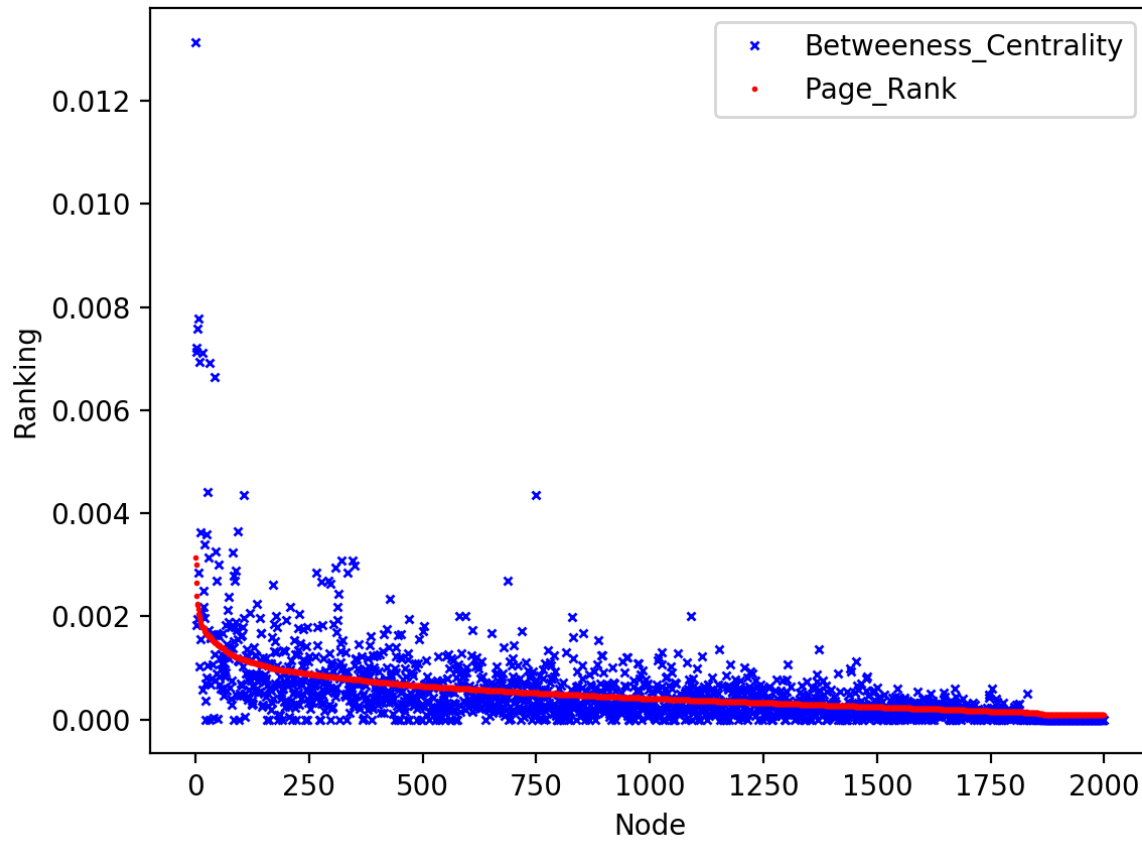
Log Tail distribution
 $a = 1.00$ $d = 1.00$ $\beta = 3.40$ $\alpha = 3.40$ $b = 2.00$ $c = 2.00$



First 2000 nodes in decreasing order of Betweenness centrality
 $a = 1.00$ $d = 1.00$ $\beta = 3.40$ $\alpha = 3.40$ $b = 2.00$ $c = 2.00$



First 2000 nodes in decreasing order of Page Rank
a = 1.00 d = 1.00 beta = 3.40 alpha = 3.40 b = 2.00 c = 2.00



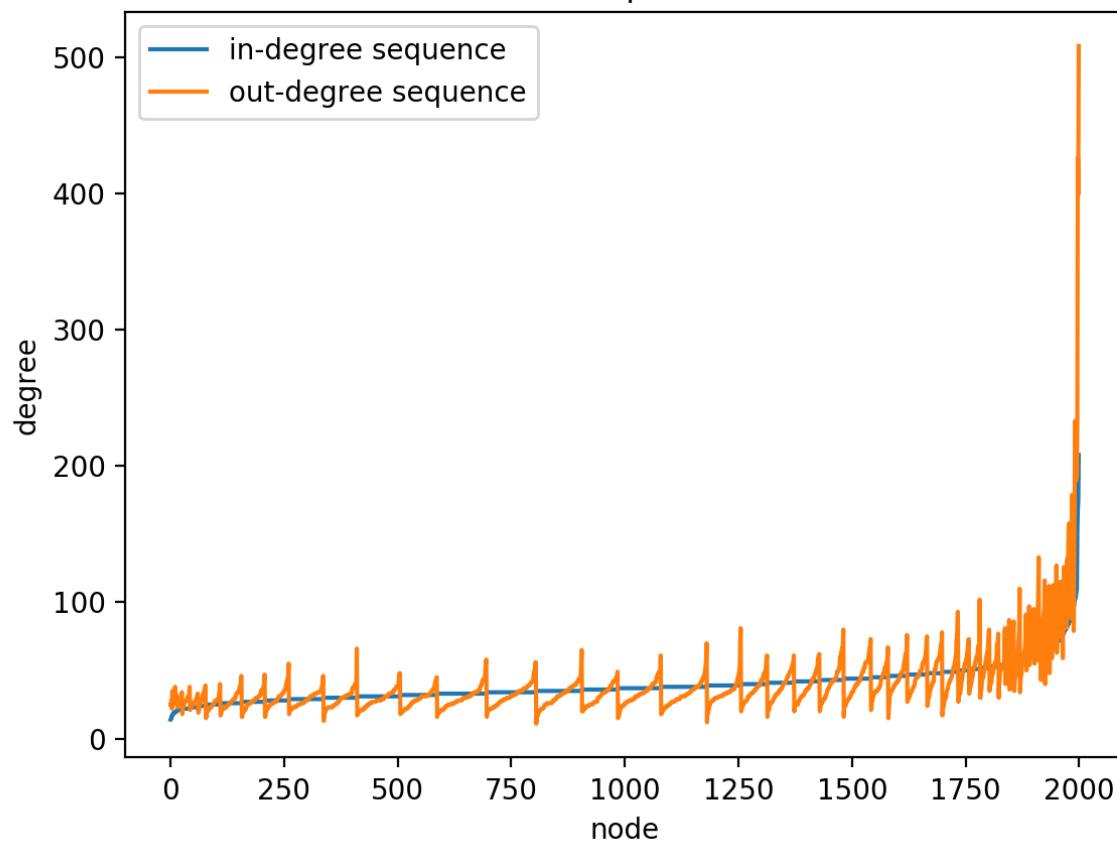
```
pearsman's rank correlation test:  
correlation = 0.659347253368334, pvalue = 8.4941213542280846e-250
```

model140

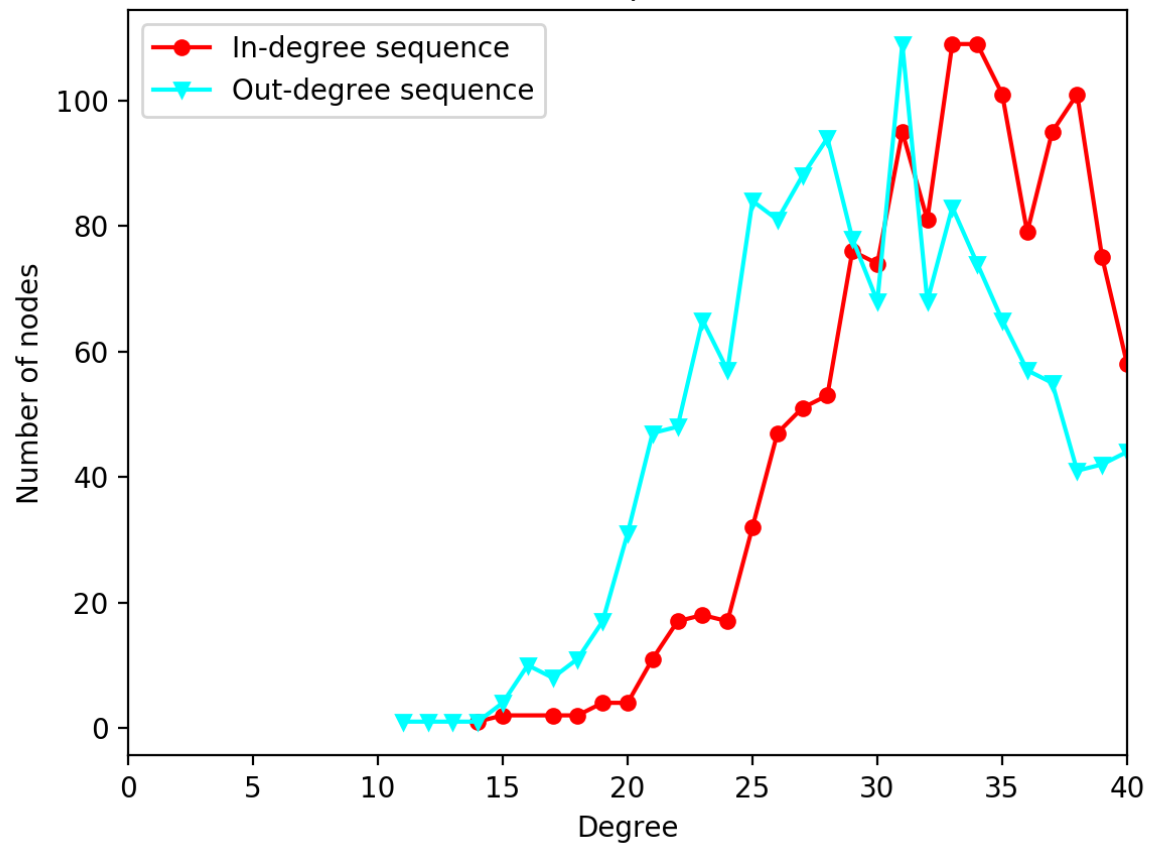
The Highest Correlation between in-degree sequence and out-degree sequence :

0.84605658710738418

Correlation: 0.84605658710738418 p-value: 0.0
a = 4.50 d = 0.60 beta = 2.60 alpha = 4.33 b = 30.74 c = 24.59

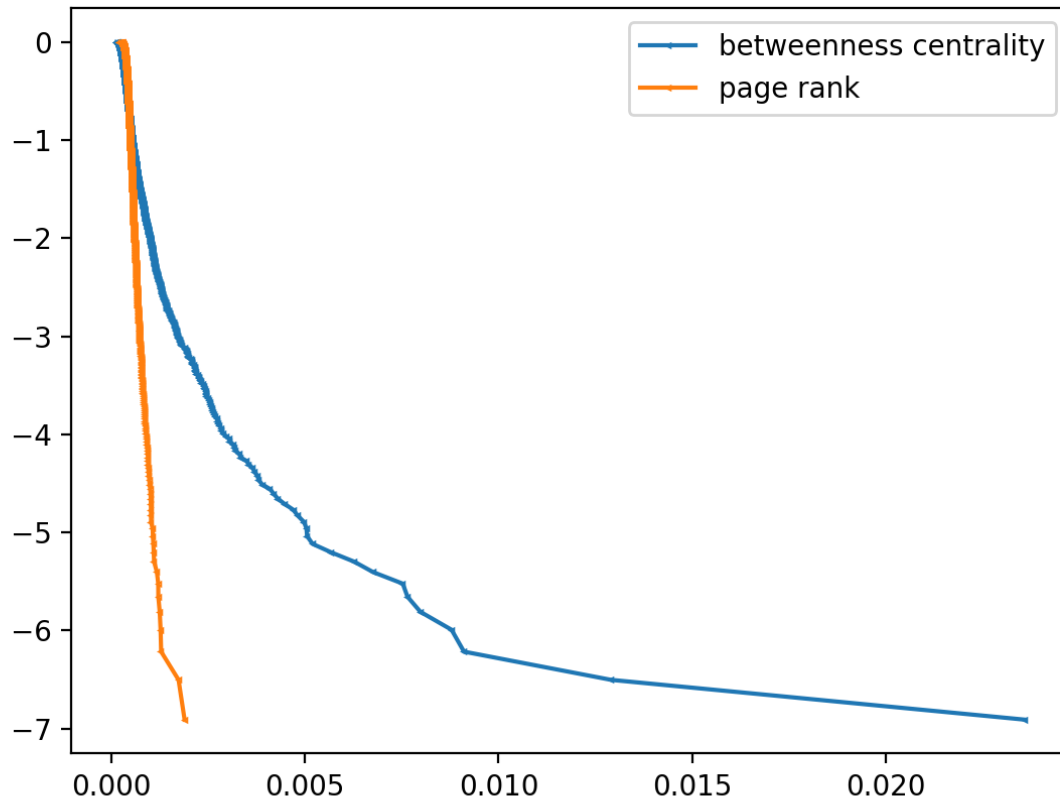


Correlation: 0.86526730290117526 p-value: 5.5452997555993722e-177
a = 4.50 d = 0.60 beta = 2.60 alpha = 4.33 b = 30.74 c = 24.59

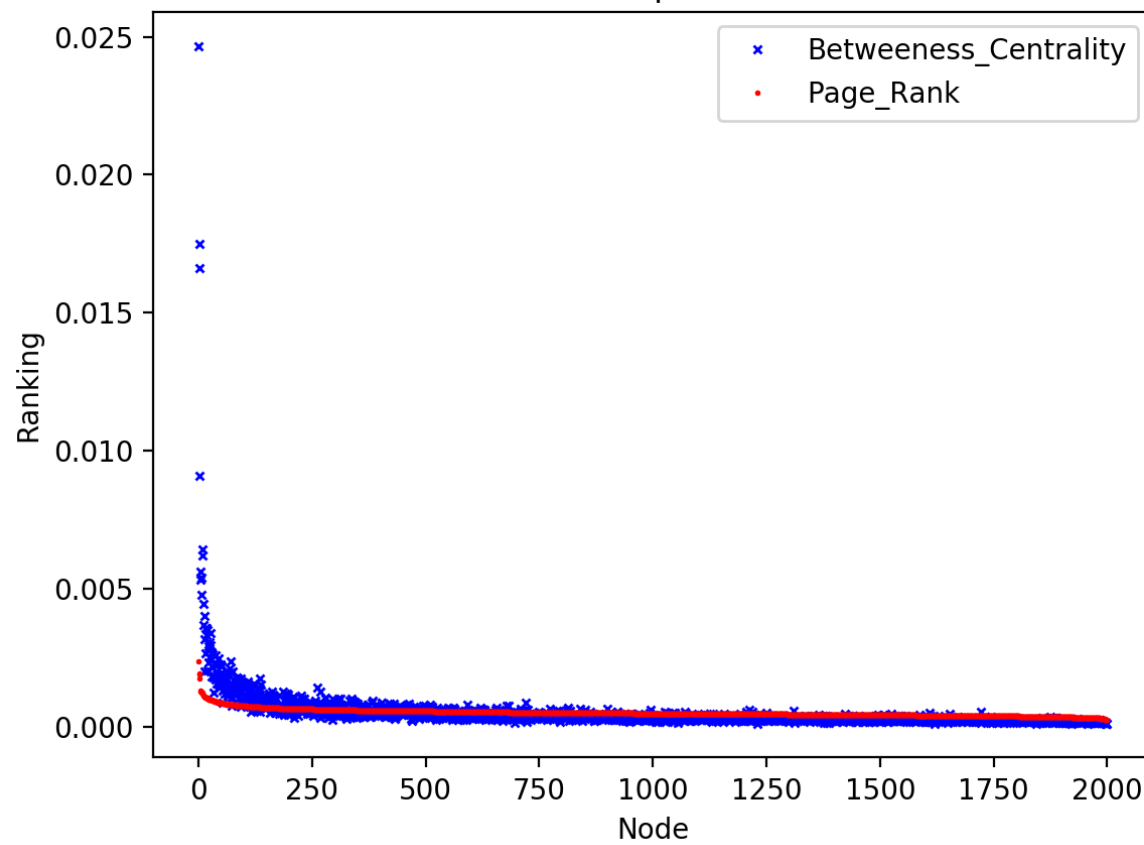


Log Tail distribution

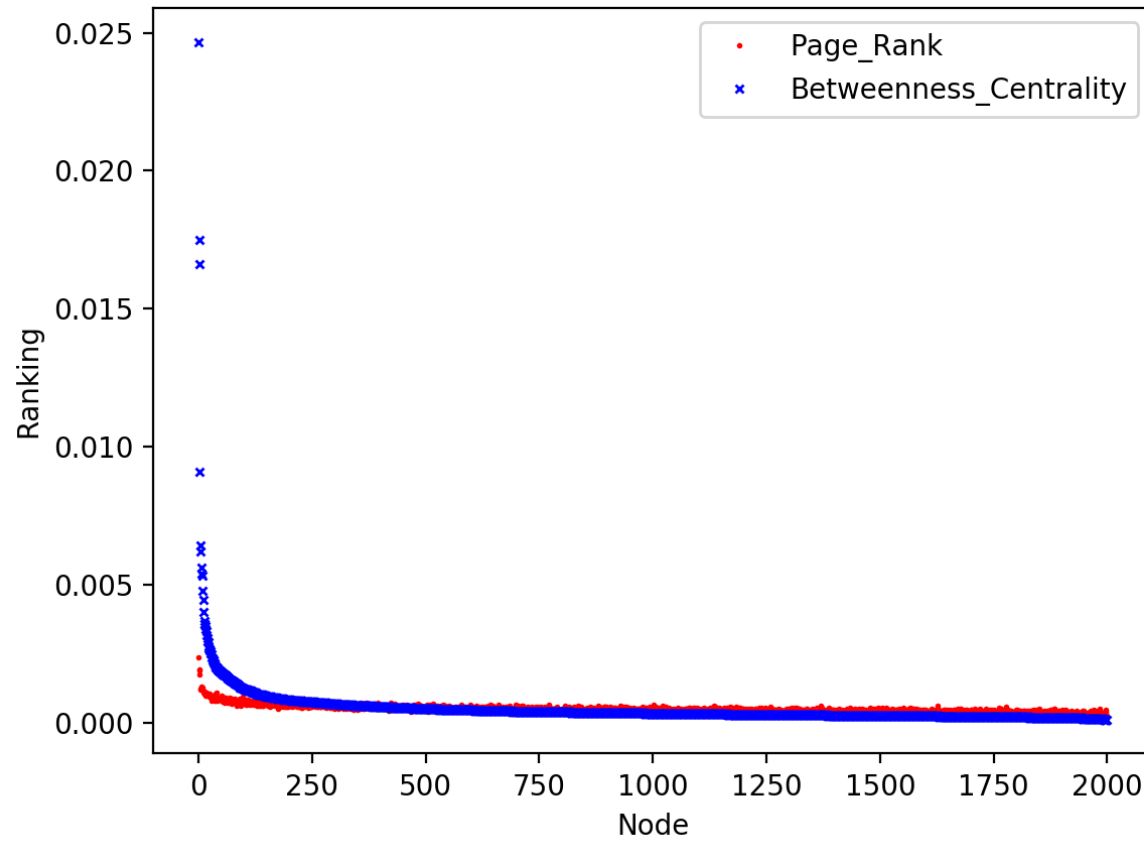
$a = 4.50$ $d = 0.60$ $\beta = 2.60$ $\alpha = 4.33$ $b = 30.74$ $c = 24.59$



First 2000 nodes in decreasing order of Page Rank
a = 4.50 d = 0.60 beta = 2.60 alpha = 4.33 b = 30.74 c = 24.59

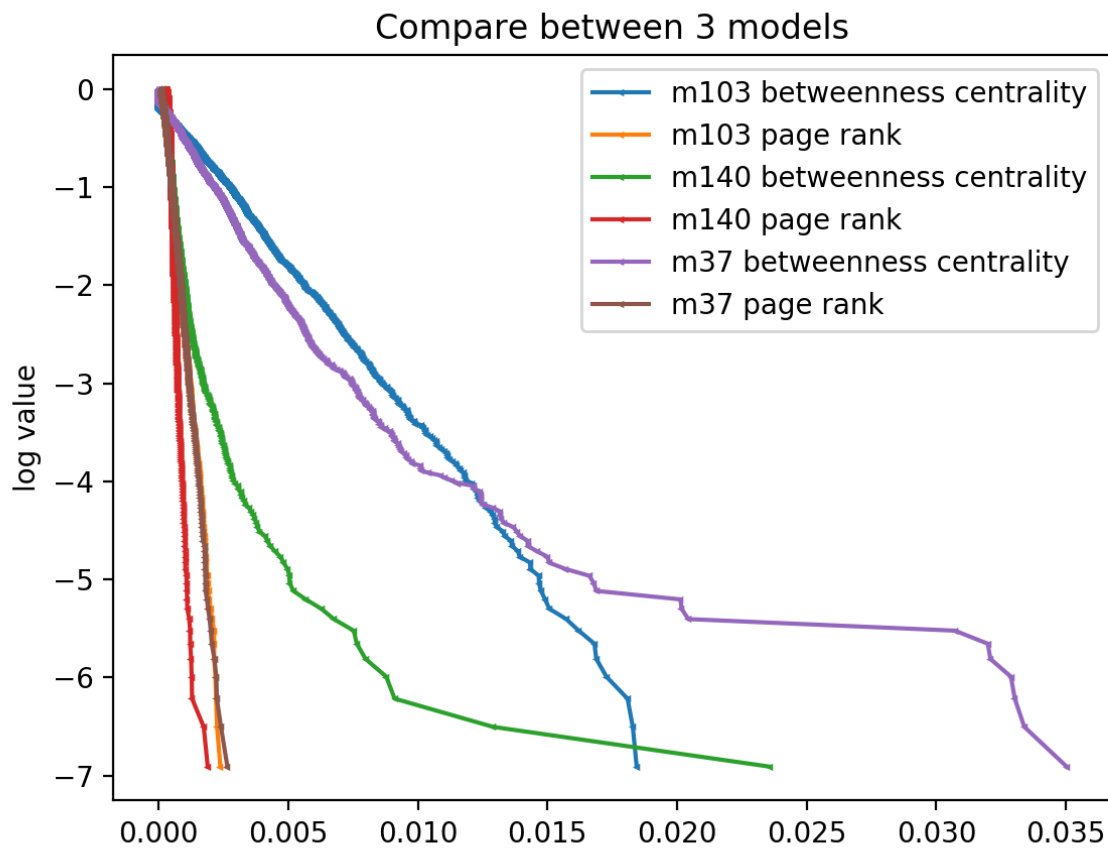


First 2000 nodes in decreasing order of Betweenness centrality
 $a = 4.50$ $d = 0.60$ $\beta = 2.60$ $\alpha = 4.33$ $b = 30.74$ $c = 24.59$



Spearsman's rank correlation test:
correlation = 0.85050471562617891, pvalue = 0.0

Comparison:



	degree_corr	rank_corr	degree_dist_corr
m103	0.04471810534893543	0.61738611373679264	0.99521686806398157
m37	0.32488658335085691	0.659347253368334	0.99790203298044999
m140	0.84605658710738418	0.85050471562617891	0.86526730290117526

rank corr and degree distribution correlation

mean-in-degree