

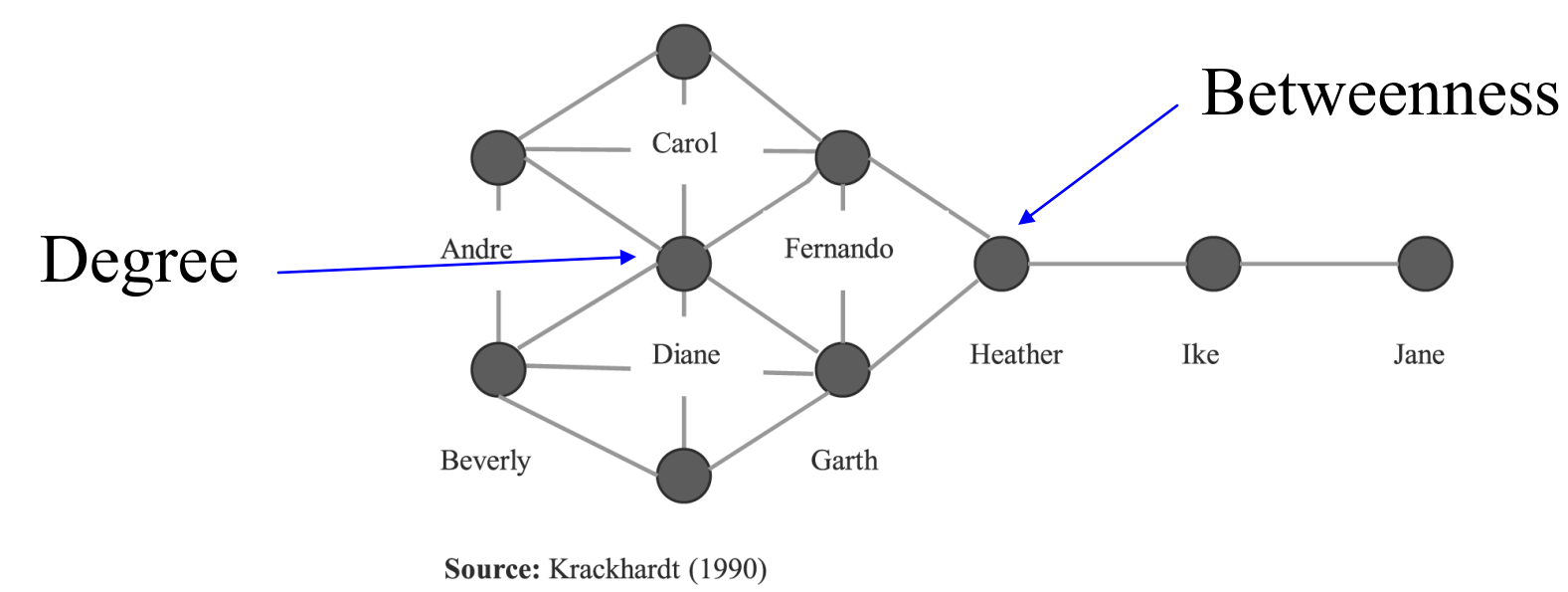
More Than the Sum of its Parts: Advancing Women Faculty at NJIT Through Collaborative Research Networks

Regina Collins, Dr. Nancy Steffen-Fluhr, Dr. S. Roxanne Hiltz, Dr. Katia Passerini, Dr. Brook Wu, Dr. Anatoliy Gruzd, Mingzhu Zhu

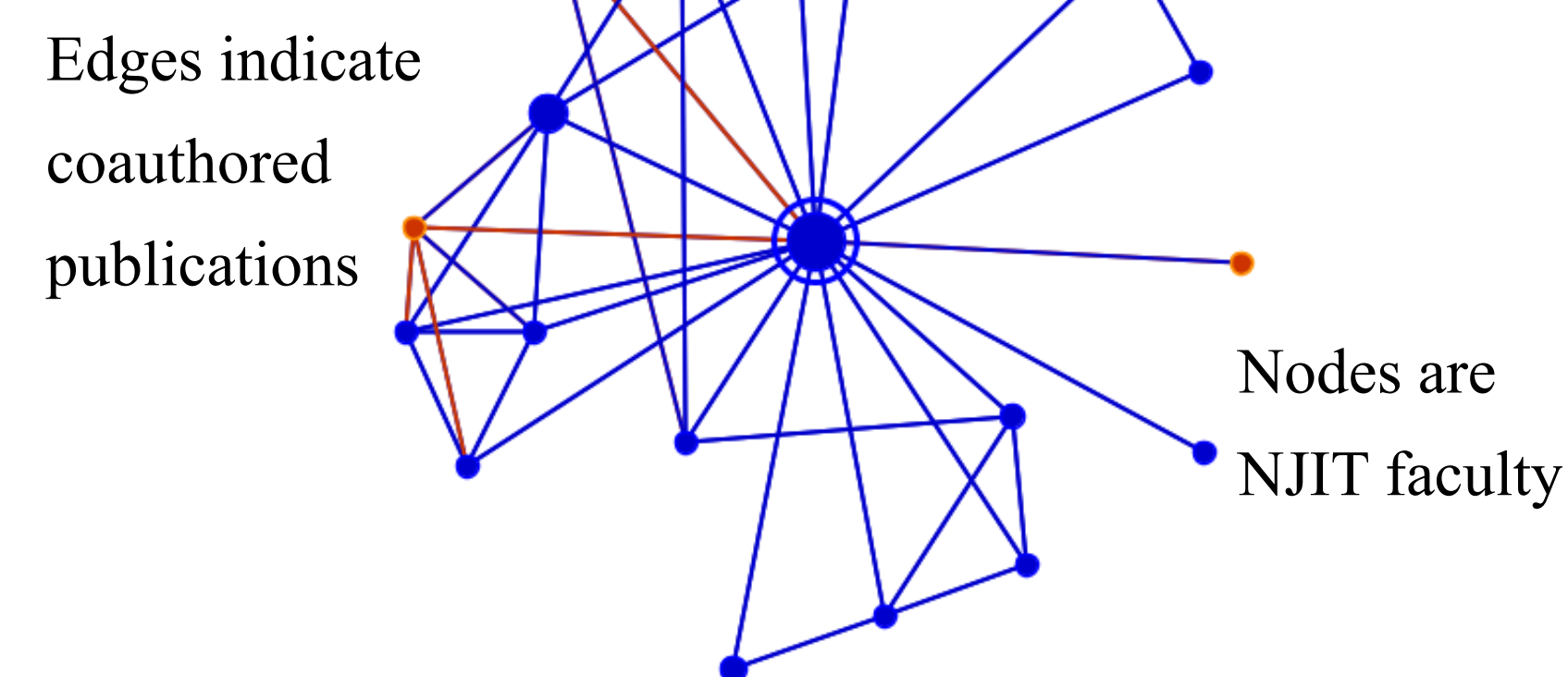
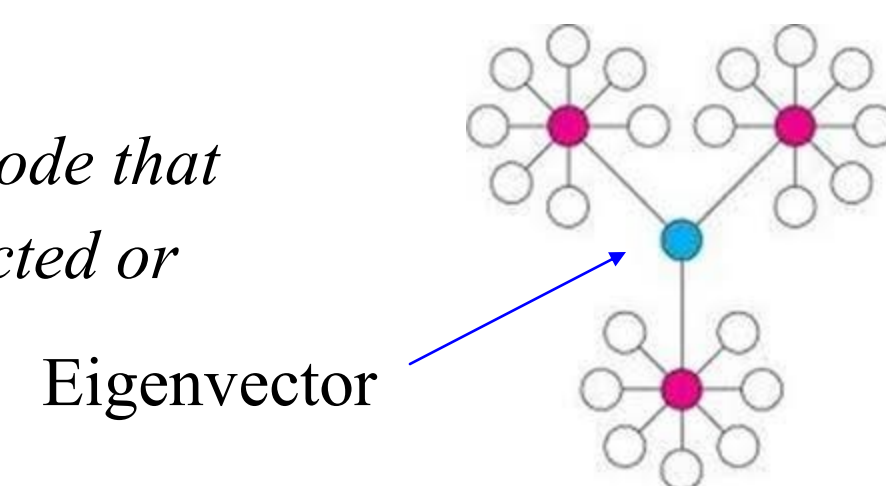
Social Network Analysis Measures

Degree Centrality—The number of ties a node has.

Betweenness Centrality—A node that is in a position to control the flow of information amongst other nodes in the network.

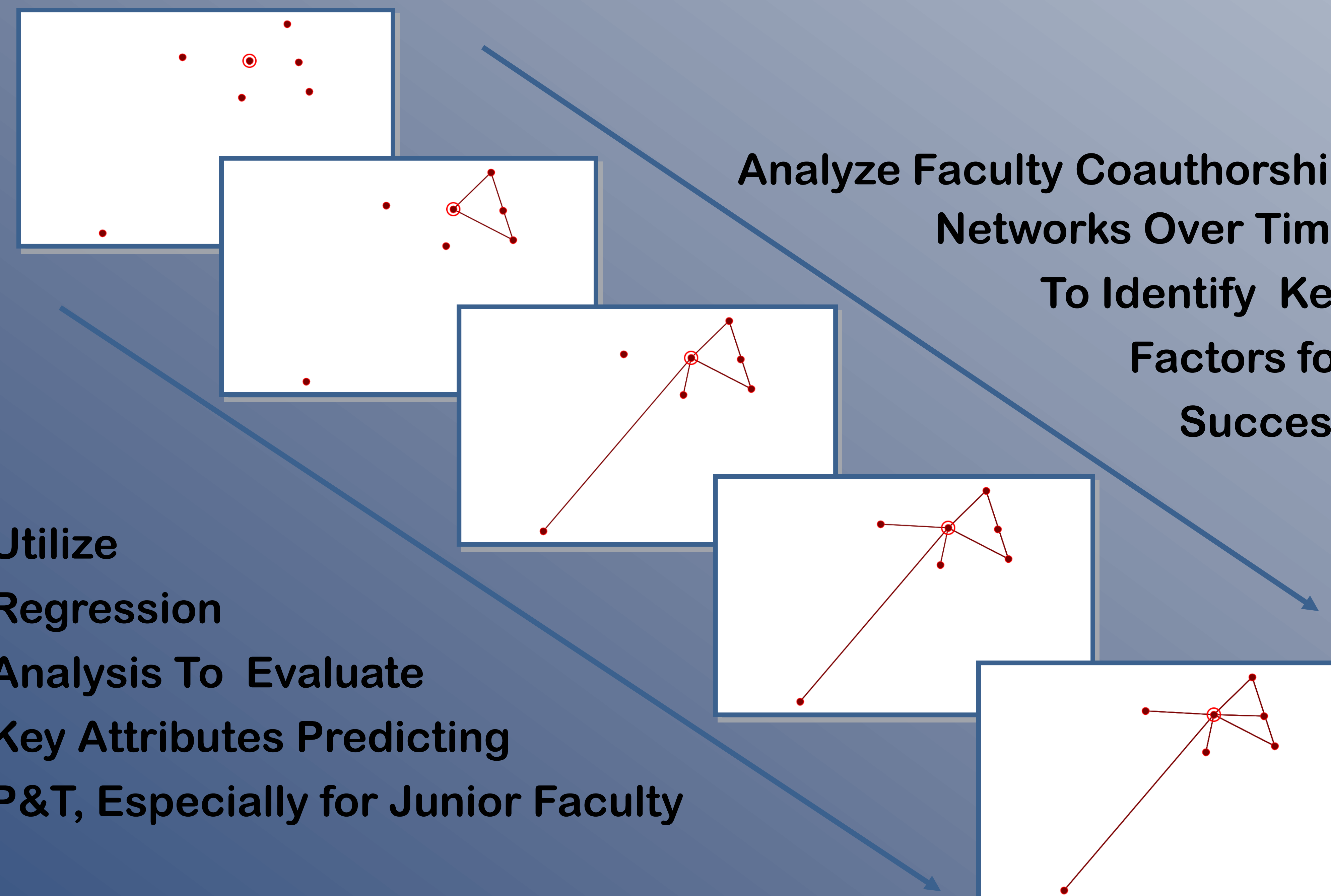
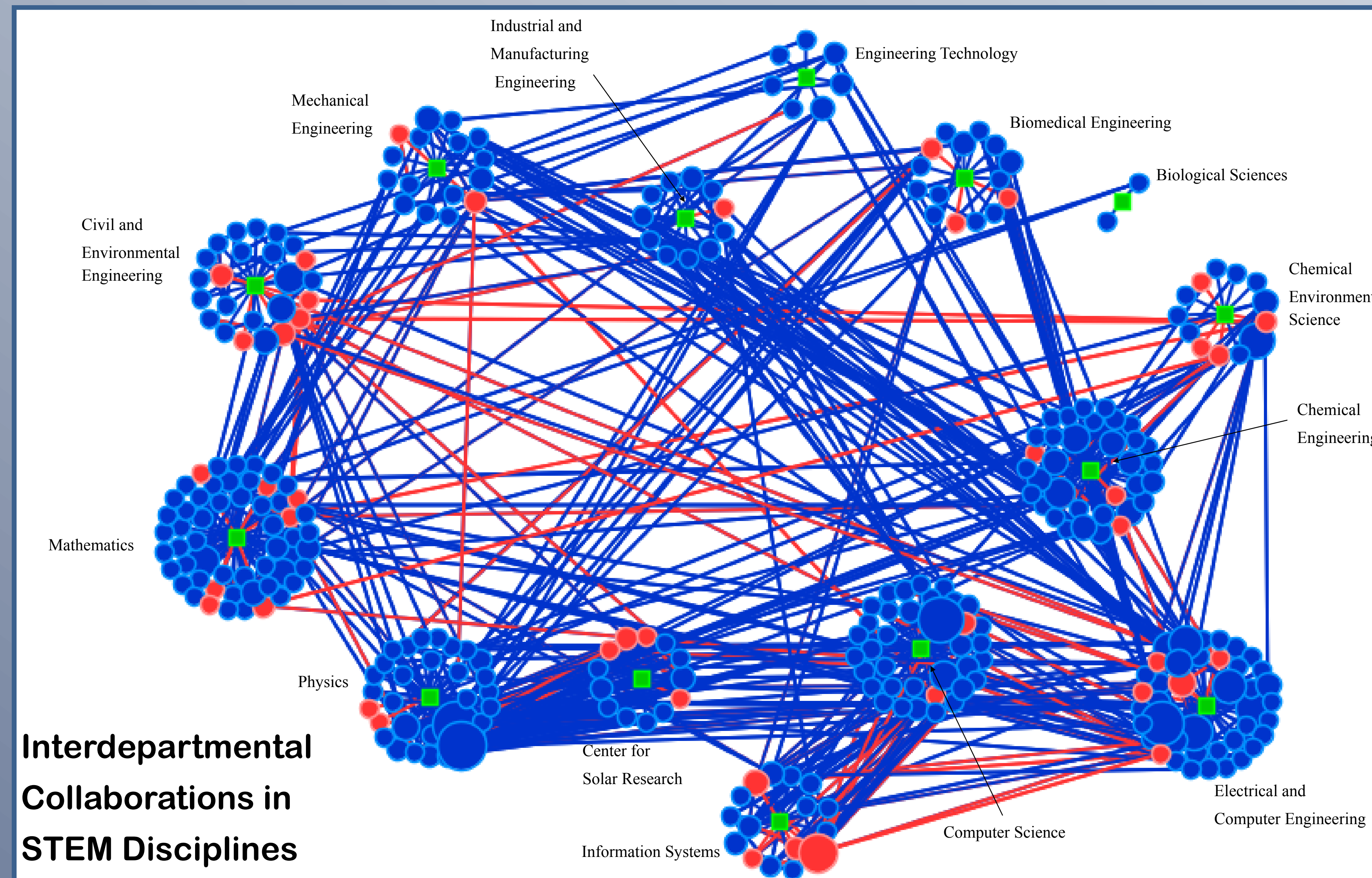
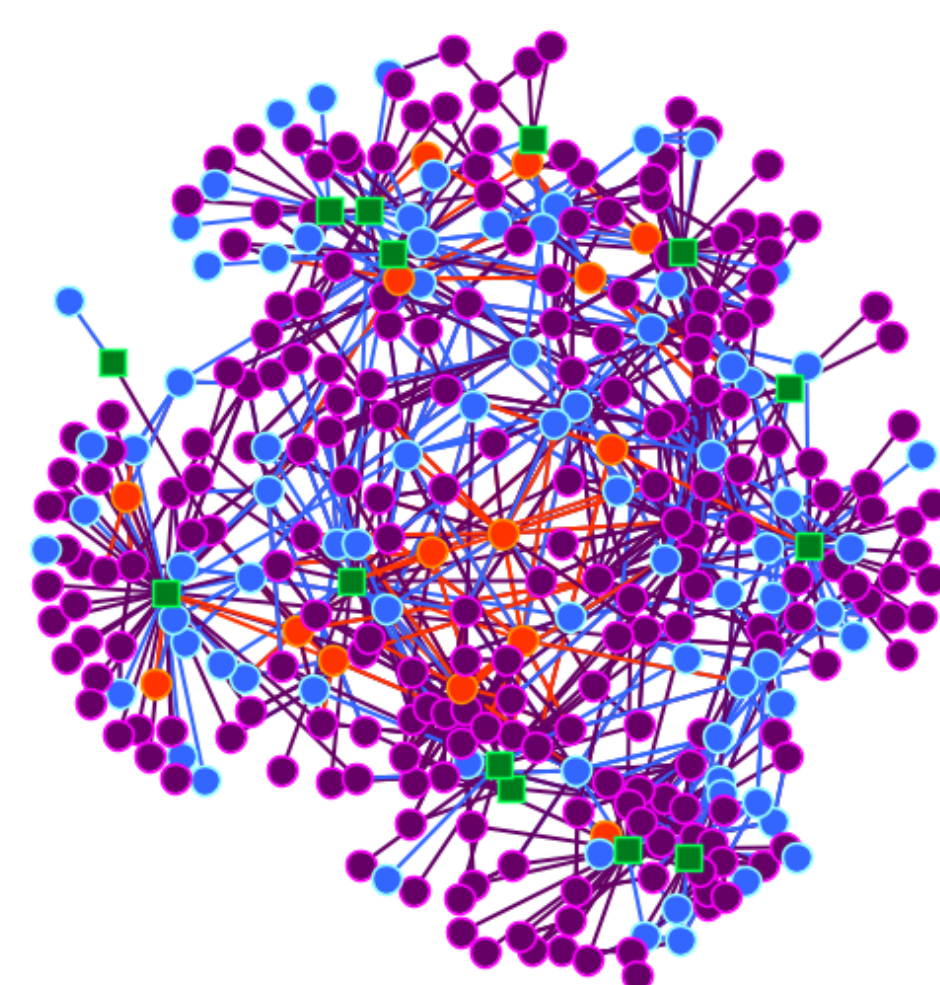
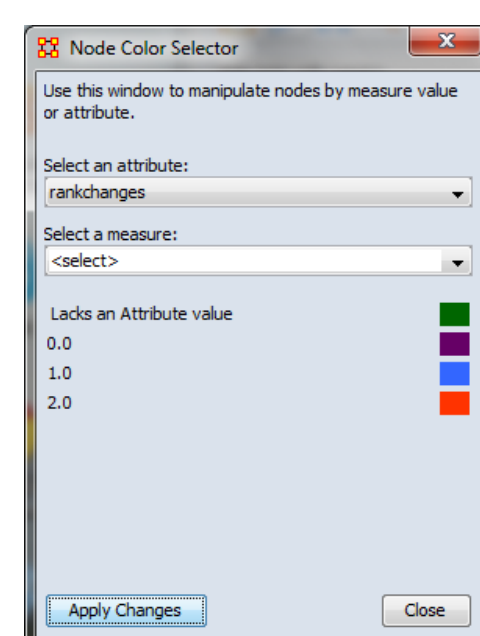


Eigenvector Centrality—A node that is connected to highly connected or influential nodes.



Node Attributes:

- Total number of publications coauthored with other NJIT faculty
- Total number of publications coauthored with at least one external coauthor
- Total number of publications coauthored with at least one graduate student
- Total number of publications
- Total number of grants applied for and awarded



Utilize Regression Analysis To Evaluate Key Attributes Predicting P&T, Especially for Junior Faculty

Analyze Faculty Coauthorship Networks Over Time To Identify Key Factors for Success

H1: STEM faculty members who collaborate more with other NJIT faculty increase in rank more frequently than those who collaborate less within the university.

Supported for all STEM faculty
 $F = 9.01, p = .0001 (df = 2, n = 413)$
 $r^2 = 0.161, p = .0014 (copublication\ rate\ \&\ rank\ change)$

H2: STEM faculty members who have higher Betweenness centrality will advance more than faculty with a lower Betweenness centrality.

Supported. For all STEM faculty
 $F = 25.15, p < .0001 (df = 2, n = 413)$
 $r^2 = 0.331, p < .0001 (betweenness\ and\ ran\ change)$

H3: Female STEM faculty have fewer total publications than their male counterparts.

Supported for all STEM faculty
 $\mu_1 = 12.08, SD = 8.83, \mu_2 = 19.19, SD = 13.34$
 $t = 3.28, p = .0011$
 $F = 10.75, p = .0011 (df = 1)$

Regression Model for Publication Rate.

For those hired between 2000 and 2003 as Assistant Professors:

Variable	Partial R-Square
Student coauthorship rate	0.8185**
NJIT coauthorship rate	0.0595*
External coauthorship rate	0.0190*

Model explains 89.70% of the variance

For all STEM faculty with at least one publication:

Variable	Partial R-Square
NJIT coauthorship rate	0.6194
External coauthorship rate	0.1072
Betweenness centrality	0.0348
Grant application rate	0.0149

Model explains 77.62% of the variance

Regression Model for Rank Change

For those hired between 2000 and 2003 as Assistant Professors:

Variable	Partial R-Square
Total publication rate	0.3335**
Total degree centrality	0.1107*
Grant application rate	0.0690*

Model explains 51.37% of the variance

