SOCIAL NETWORK ANALYSIS
On Slack Messages from PICUP Community

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Background

PICUP
Partnership for Integration of Computation into Undergraduate Physics

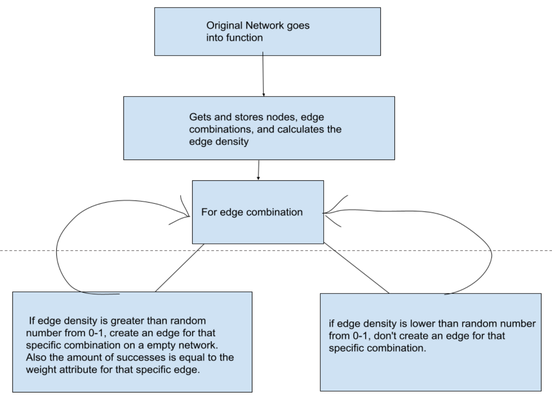
- Influence the integration of computation with undergrad physics courses.

Objectives

- Figure out the best way to create a random networks based on our original network so we can have a better statistical analysis

Method/Data

We will create a network from our data. Create multiple random networks by plugging it into our WRG function.



For each random graph generated we'll compute the Global Clustering Coefficient(GCC) and plot it on a histogram. This is how will be able to see the numbers for each metric and add an x=metric of ognetwork, to compare it to our random networks.

A	B	D	E	G	H	I	J
Date	Time	Userid_From	Message	Userid_To	Post_Catego	Channel	To_Channel
4/11/17	11:51	U1YKKMTFE	likes	U1YEMA4BA	emoji	glowscript	FALSE
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4/12/17	11:48	U4GVBA31T	@hgclose th	U1YKKMTFE	response	glowscript	FALSE
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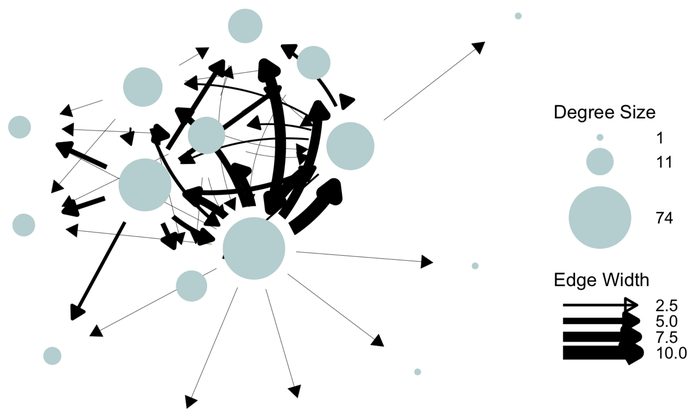
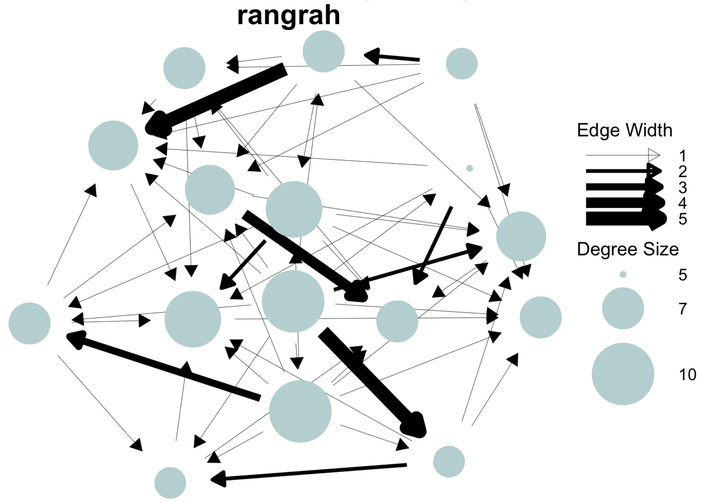
4/12/17	13:24	U1YKKMTFE	OK, good. In	U4GVBA31T	request	glowscript	FALSE

Results

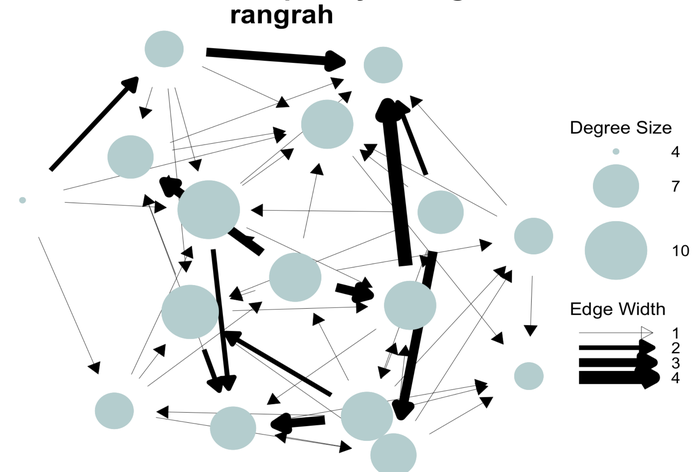
Network with Frequency of Edges: oggraph



Network with Frequency of Edges: rangrah

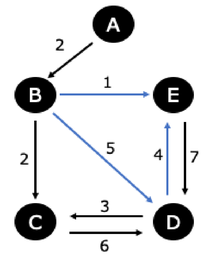


Network with Frequency of Edges: rangrah



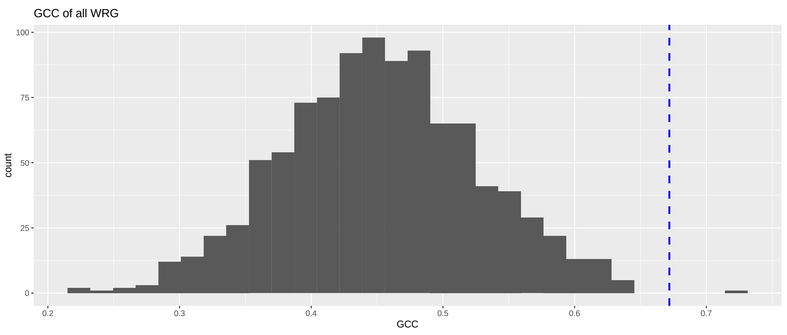
Global Clustering Coefficient (GCC):

- Measure of how tightly nodes cluster together
  - Opsahl, Tore, and Pietro Panzarasa. "Clustering in weighted networks 31.2 (2009): 155-163.



- $C_w = \frac{Total\ Value\ of\ Closed\ Triplets}{Total\ Value\ of\ all\ Triplets} \in (0,1)$
  - Counting Transitive Triplets
- Triplet Value
  - Geometric mean of open triplet: $\sqrt{5 * 4}$

- Large GCC: Many transitive triplets, especially with strong ties
- Characterizing closing connection between a group of 3 individuals



- The mean for the random network's is 0.4491024 with a SD of 0.07039677
- Original network is 4SD larger than random network, so we have a significant amount of communication.

Next steps

- Run the WRG function with different channels such as picuppokemon or hackathon.
- Find another randomization method that we could turn into a function and create more accurate networks.

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Advanced Computational Research Experience for Students