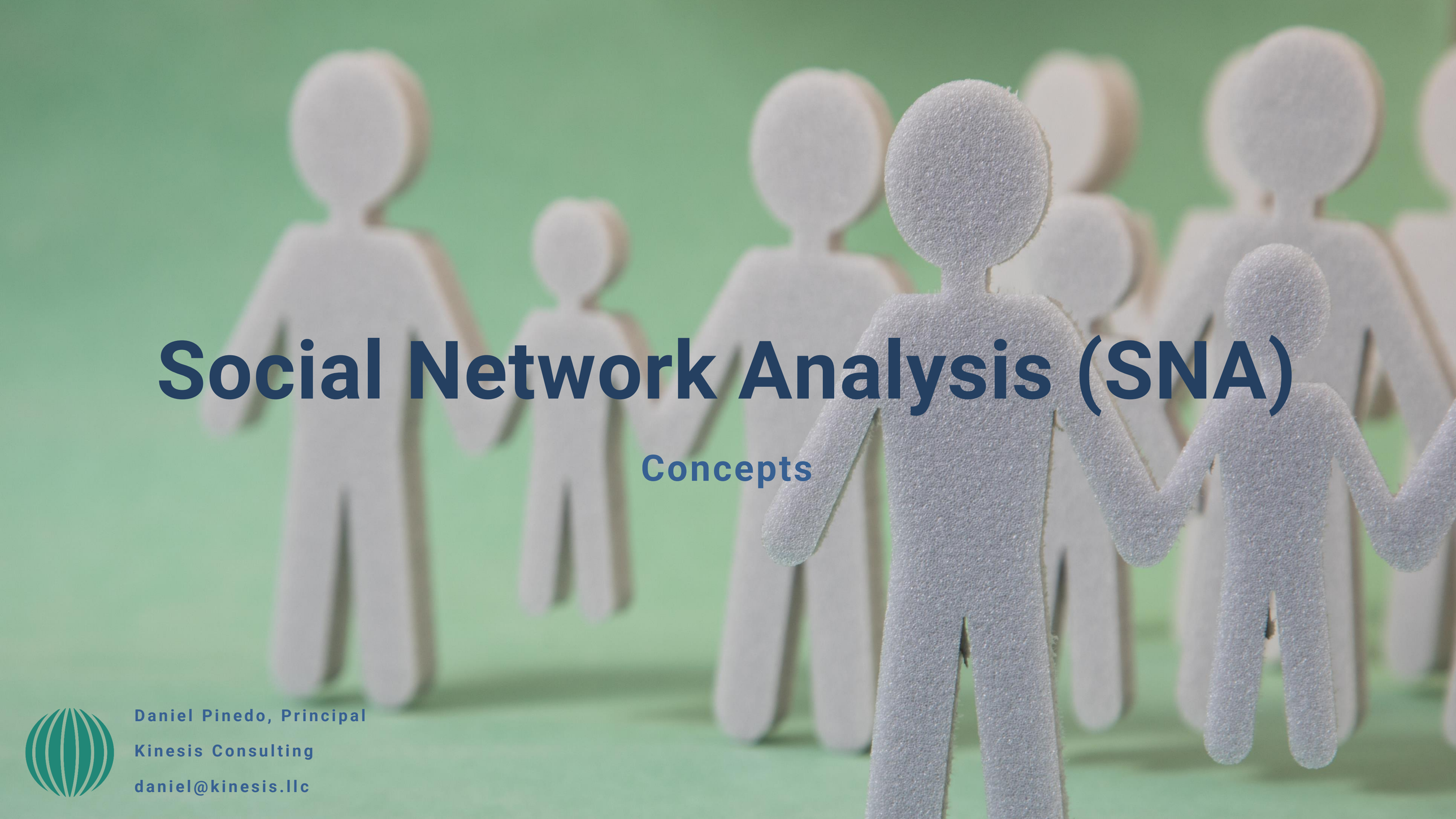

Social Network Analysis (SNA)

Concepts

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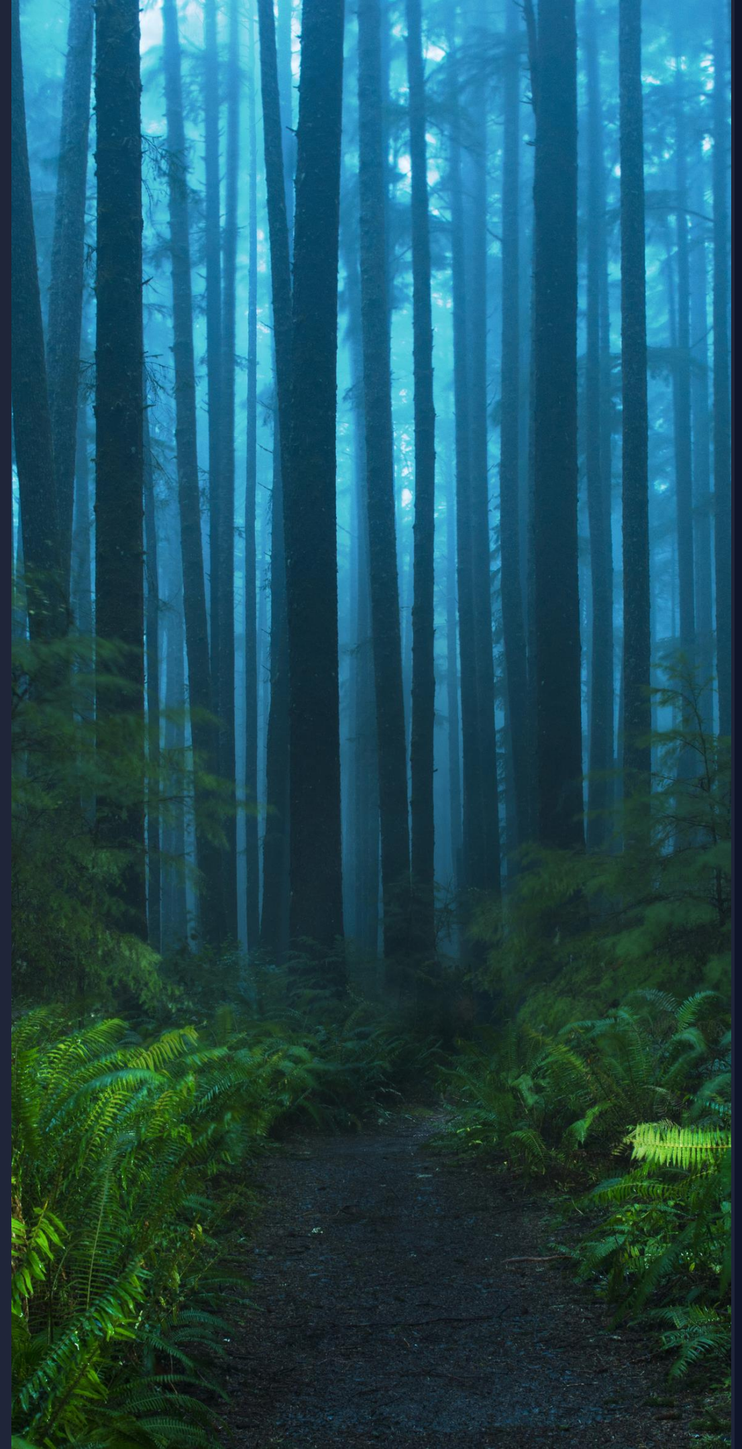
The Forest



The view of the network as a whole

Summary Statistics

Network Size

The total amount of nodes and connections (edges) in a graph

Network Density

a measure of how many connections between nodes exist compared to how many connections are possible.

Strong vs. Weak connections

Strong or weak connected network?

(Trade-off: dynamism or resilience?)

Weak Connections

- Fast movement of connections through a **dynamic** network.
- May also indicate heterogeneity of connections/ideas
- They may break quite easily and show fragility in the network.
- Weak connections have a weight of one

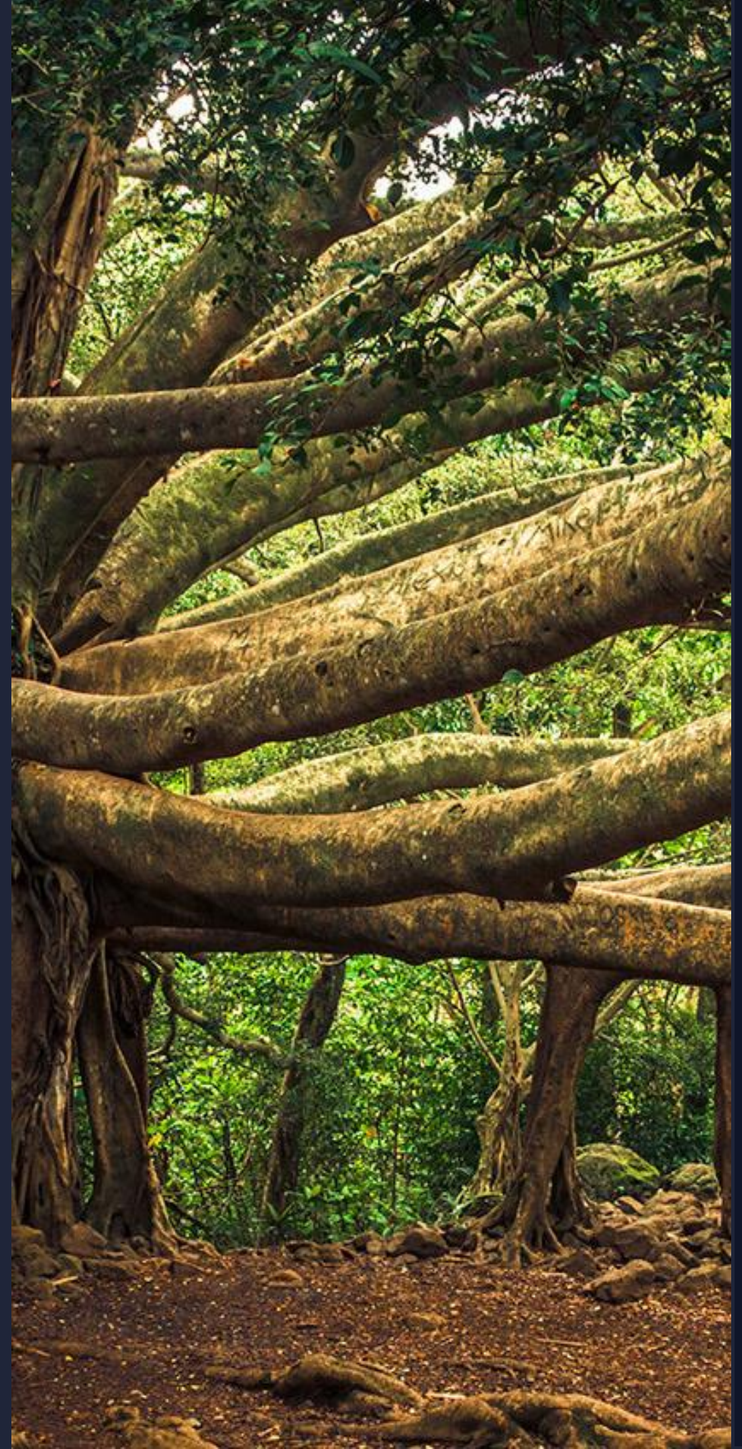
Strong Connections

- Consistency of connections through a **resilient** network.
- May also indicate homogeneity of connections/ideas
- They are strong and show robustness in the network.
- Strong connection have a weight greater than one

Trade-off

- Dynamic networks may indicate creativity and/or fast pace, and the connections are fragile.
- Resilient networks may indicate stagnancy and/or continuous connections, and the connections are robust.
- **Caveat**: these concepts are only relevant to weighted networks, where there are multiple potential connections between nodes

The Tree

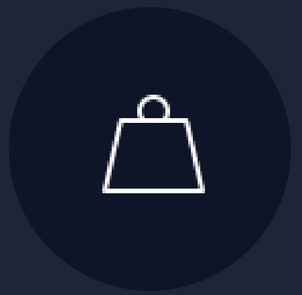


The view of the network as components

Node Centrality Statistics

Degree

- The number of connections a node has.



Strength

- The number of connections a node has including weights of connections (when relevant).

Betweenness

- Represents the degree to which nodes stand between each other. [2]
- High node betweenness may indicate large influence in the network.
- Their removal from the network may likely fragment the network.

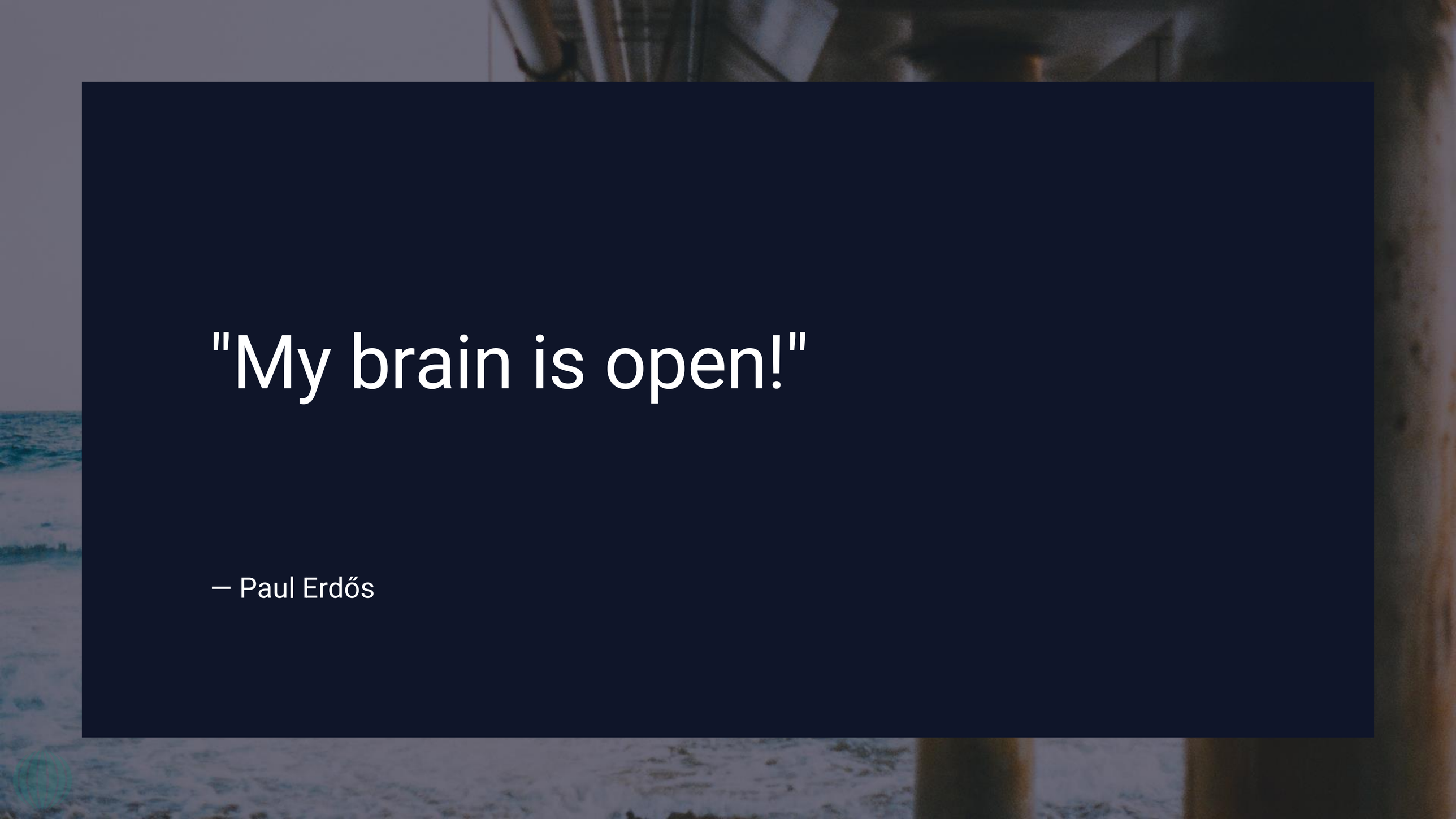
Closeness

- The more central a node is, the closer it is to all other nodes. [2]
- High node closeness may indicate an ability to spread information efficiently through a network, and/or
- Who controls or moves vital resources and information.

Edge Centrality Statistics

Betweenness

- Represents the degree to which connections with pairs of nodes stand between other pairs of connected nodes.
- High edge betweenness may indicate large influence in the network.
- An example is a strong collaborative relationship.
- The removal of this collaboration from the network may likely fragment the network.



"My brain is open!"

— Paul Erdős

References

1. Newman, M. (2018). Networks. Oxford university press.

2. Wikipedia

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