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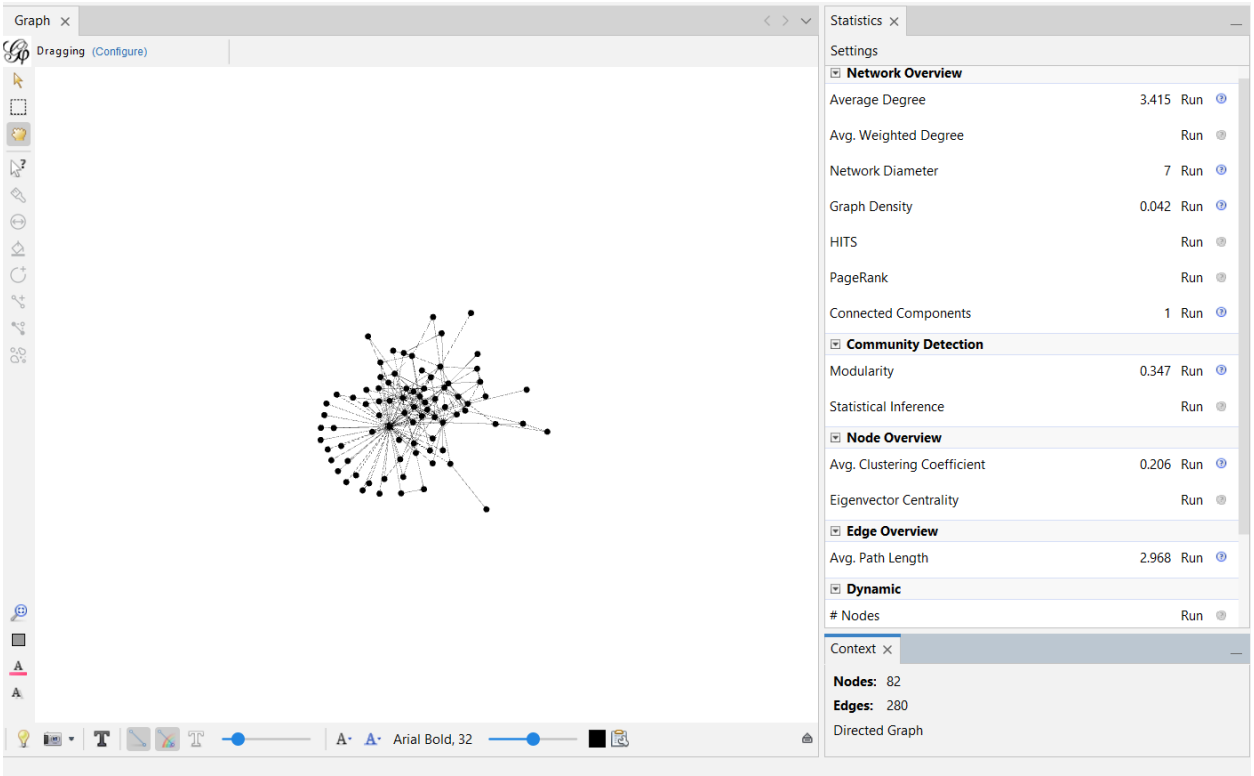
Comparing Malicious (5G Conspiracy) and Benign (Non-Conspiracy) Twitter Subgraphs from the WICO Dataset

Benign Graph (from Non_Conspiracy_Graphs folder): A normal Twitter community discussing COVID-19 or 5G without conspiratorial links (e.g., factual discussions or debunking).

Malicious Graph (from 5G_Conspiracy_Graphs folder): A misinformation cluster promoting 5G-COVID causal claims. **Comparison of Structures**

Graph Summaries and Metric Interpretations

Benign Graph (Non_Conspiracy)

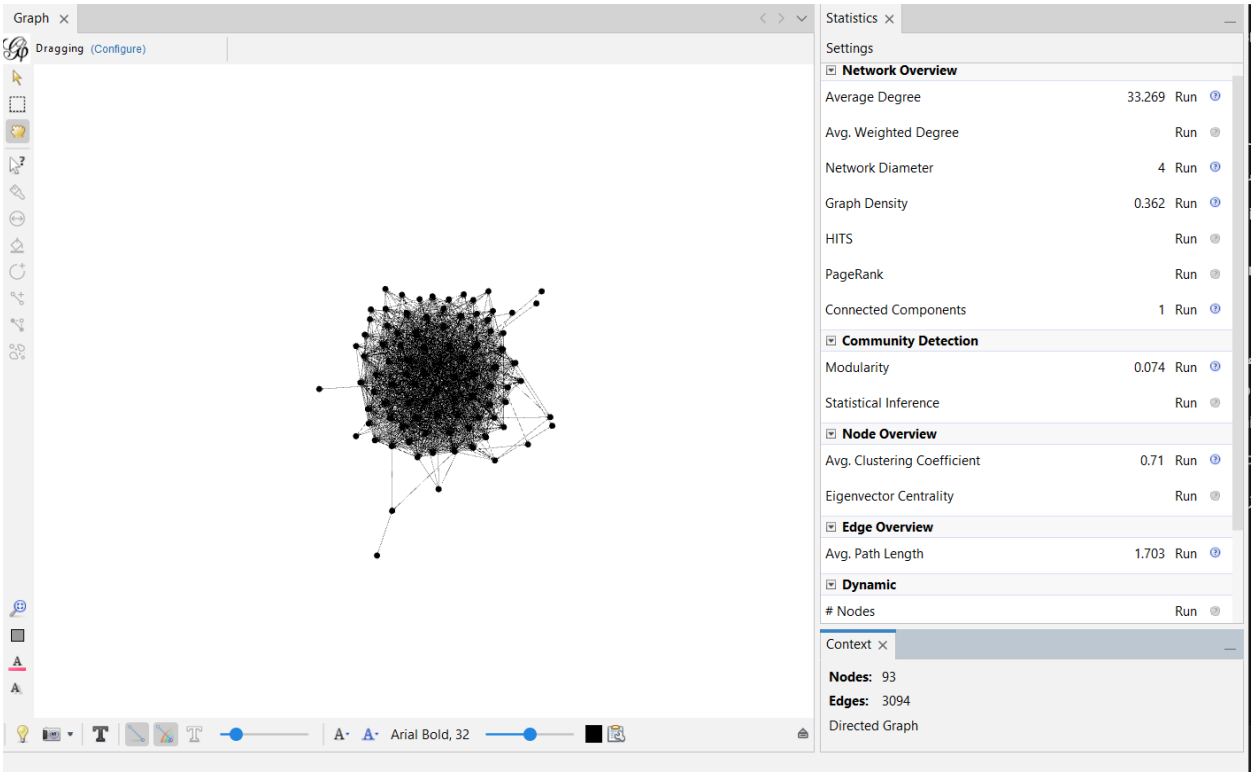


- **Structure Overview: 82 nodes (users) and 280 edges (directed follows). The network is weakly connected with a diameter of 7, indicating longer paths between users. Visualization shows a star-like core with peripheral spokes, suggesting moderate influence hierarchy.**

Metric	Value	Interpretation
Number of Nodes	82	Moderate community size; typical for organic Twitter discussions.
Number of Edges	280	Sparse connections.
Average Degree	3.415	Low-to-moderate connectivity; users follow few others, implying diverse external interests rather than insularity.
Graph Density	0.042	Low density (4.2% of possible edges present); open network with room for cross-topic interactions.
Average Clustering Coefficient	0.206	Moderate clustering (20.6% of user triads closed); some local "friend groups" form, but not highly tribal.
Connected Components	1	Fully connected; no isolated silos, allowing information flow.
Average Path Length	2.968	Relatively short paths; "small-world" property present but stretched, enabling broad reach without overload.
Network Diameter	7	Longest path is 7 hops; suggests scalability but potential for slower rumor decay.
Modularity	0.347	High modularity

This graph represents a healthy, diverse network where users engage across boundaries, with built-in modularity preventing echo chambers.

Malicious Graph (5G Conspiracy)



- **Structure Overview: 93 nodes and 309 edges. Shorter diameter (4) and paths indicate a more compact, efficient structure. Layout reveals a dense core-periphery model, with high-centrality nodes (hubs) dominating follows, typical of coordinated misinformation spread.**

Metric	Value	Interpretation
Number of Nodes	93	Slightly larger than benign; scalable for viral conspiracy propagation.
Number of Edges	309	Slightly denser than benign; avg. ~3.3 follows, but concentrated around influencers.
Average Degree	3.327	Similar to benign; however, distribution likely skewed (few high-degree spreaders).
Graph Density	0.036	Low density (3.6%); still sparse, but edges cluster tightly, aiding rapid dissemination within the core.
Average Clustering Coefficient	0.071	Low clustering (7.1%); weak local ties, prioritizing broadcast over reciprocal engagement—ideal for one-way propaganda.

Metric	Value	Interpretation
Modularity (Q)	0.074	Low modularity; weak community divisions (likely 1–2 blurred communities), fostering a unified "echo chamber" where dissent is minimized. Number of communities: ~1 (inferred from low Q).
Connected Components	1	Fully connected; efficient for consensus-building on false narratives.
Average Path Length	1.703	Very short paths; strong small-world effect, allowing misinformation to reach all users quickly (e.g., 1–2 hops from a central tweet).
Network Diameter	4	Compact diameter; facilitates fast global spread, contrasting benign's sprawl.

To highlight differences

Metric	Benign (Non_Conspiracy)	Malicious (5G Conspiracy)	Key Difference
Nodes / Edges	82 / 280	93 / 309	Malicious slightly larger; ~10% more edges relative to nodes, hinting at intentional density buildup.
Average Degree	3.415	3.327	Nearly identical; both sparse, but malicious likely has higher variance (power-law tails for super-spreaders).
Graph Density	0.042	0.036	Benign denser overall; malicious compensates with strategic edge placement.
Avg. Clustering Coefficient	0.206	0.071	Benign 3x higher; normal networks foster mutual reinforcement, while malicious prioritizes hierarchy over cliques.
Modularity (Q) / Communities	0.347 / ~4	0.074 / ~1	Benign far more modular; fragmented discussions dilute extremes. Malicious low Q indicates homogenized beliefs, reducing internal debate.
Connected Components	1	1	Equivalent; both cohesive, but malicious leverages this for faster contagion.

Metric	Benign (Non_Conspiracy)	Malicious (5G Conspiracy)	Key Difference
Avg. Path Length / Diameter	**2.968 / 7**	**1.703 / 4**	**Malicious ~40% shorter paths/diameter; optimized for viral speed, explaining rapid conspiracy takeoff (e.g., 5G arson spikes).**