BUILDING A SERVER-CLIENT FRAMEWORK: VISUALIZING SOCIAL GRAPHS AND QUERYING HUMAN RELATIONS

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Abstract

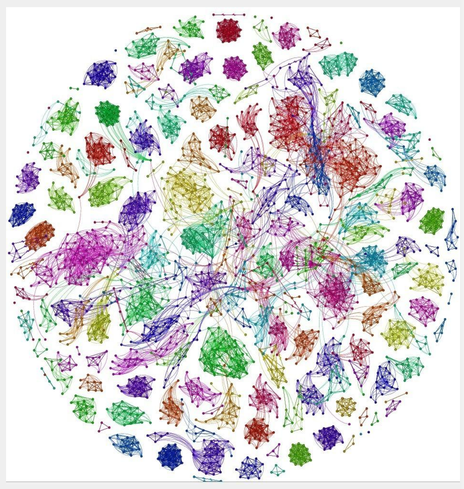
Modern graph visualizing software has been applied to social networks in displaying the visualized results of whole graphs. It is evident that the high complexity of social networks has prompted a need for more complex query results and the visualization of complex relationships among humans. Resolving complicated graphs would allow the end-users to understand the social query structure and semantics. Nevertheless, visualizing millions of people, represented as nodes, and relationships, represented as edges, for a single search may incur heavy overhead on the users system, proving inefficient and resulting in a non-user friendly experience. Our goal is to implement this server client model based graph visualization framework. By moving the complex queries, such as a graph match, graph iceberg, and graph olap query, to a server and displaying the results on the client side. This will result in an effective method to handle heavy social graphs. Achieving implementation of this framework will result in a social graph querying and visualizing software, Project SocialViz, which will illustrate the complex relationships between humans by displaying graph queries.

Motivation

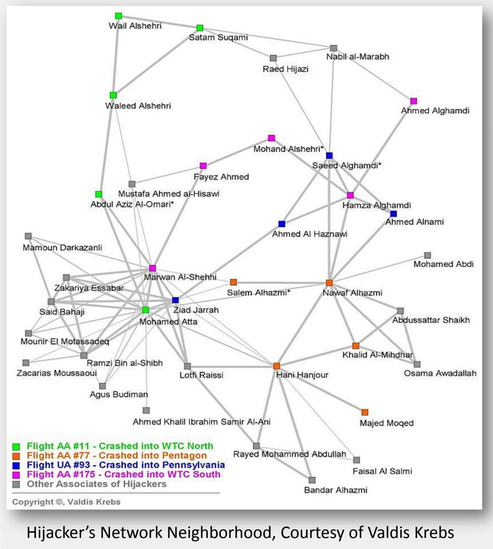
Big Data

With a lot of data being aggregated through social networks we can use this information in a structured way to query and analyze human relationships.

Analyze YouTube Videos



Social interactions can be modeled as graphs with millions of nodes/edges but how can we use this to our advantage?



Hijacker's Network Neighborhood, Courtesy of Valdis Krebs

Analyze Terrorist Networks

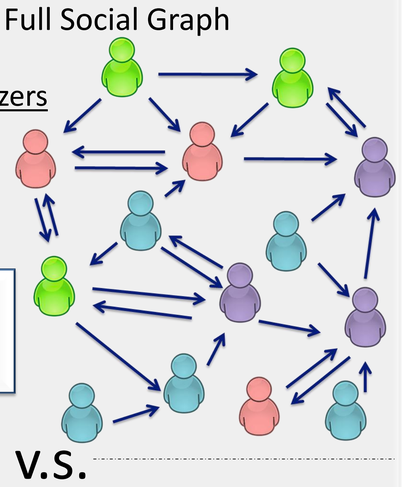
If we can visualize patterns from social graphs we can predict and gather information about criminal networks.

Unique Features

Project SocialViz v.s. Existing Software

Displaying Full Social Graph

Existing Software Visualizers
Gephi
Cytoscape
Graphviz



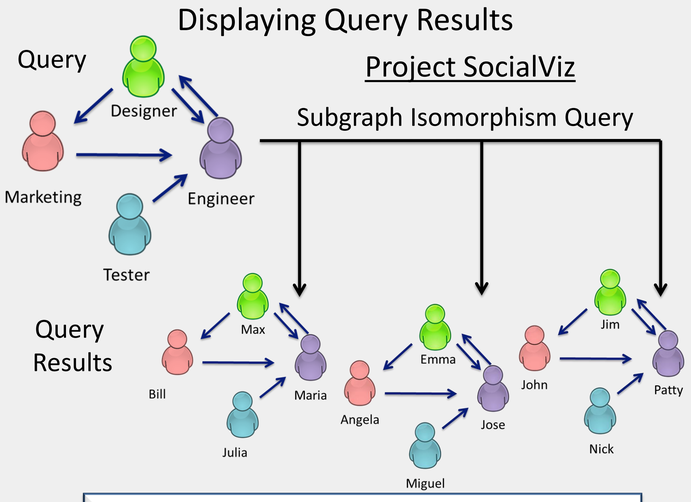
Users see the whole graph and get overwhelmed.

V.S.

Displaying Query Results

Project SocialViz

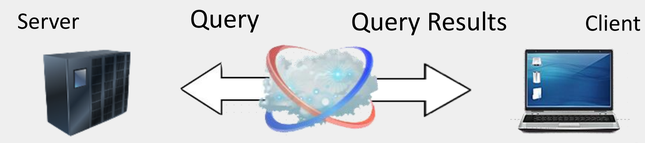
Subgraph Isomorphism Query



Display to the user only what's important, query sub-graphs.

Methods

Server – Client Model

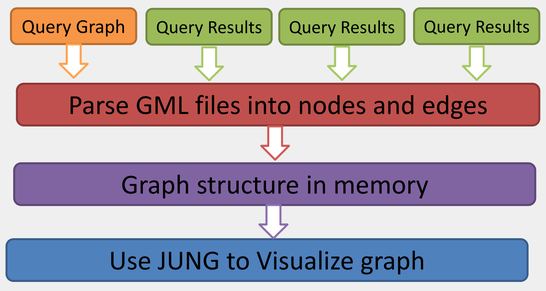


Graph Database and Query Algorithms

GUI - Java Universal Network/ Graph Framework

Project SocialViz scrutinizes the data set by query algorithm traversal on the server side to improve client side performance.

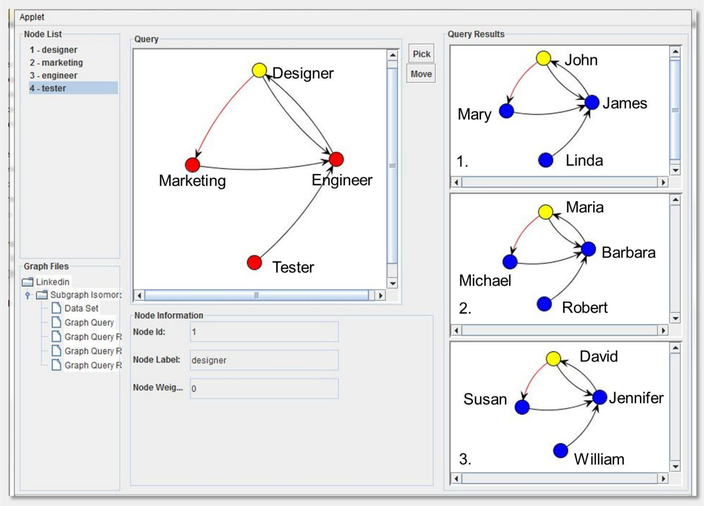
Application Side



Project SocialViz uses the Java Universal Network/Graph Framework to display the results.

Results

Project SocialViz Software



Project SocialViz implements a query and query results graphs to provide the user with an easy understandable answer from the data set.

Conclusion

"Big Data" a recent term being used by the media and industry refers to all the vast complex data sets that are produced by users. These can be visualized as social graphs which current software implements. Project SocialViz, a social graph framework, will empower and inform the user by displaying only what's necessary by submitting graph queries. This is all done by a server-client framework that allows query algorithms to traverse huge data sets and give quick feedback to the user in a clean user friendly way.

Future Implementations

- Integrate more data sets
- Have the ability to relax query constraints
- Add more query algorithms
- Drill-down, roll-up mechanism
- Add a web interface
- Make it an open-source project
- Apply idea to other networks e.g.
  Chemical , Biological Networks, etc.

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