

# Social Graph Visualizer



Courtesy of Salmon.com

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# Big Data

Problem: Social Graphs are big. How do we analyze a social graph to find patterns without overwhelming the user with such a complex network.

Goal: Give the user the ability to use a social graph visualizer to view, manipulate, query and match the part of a social graph that is only important with a intuitive user interface.

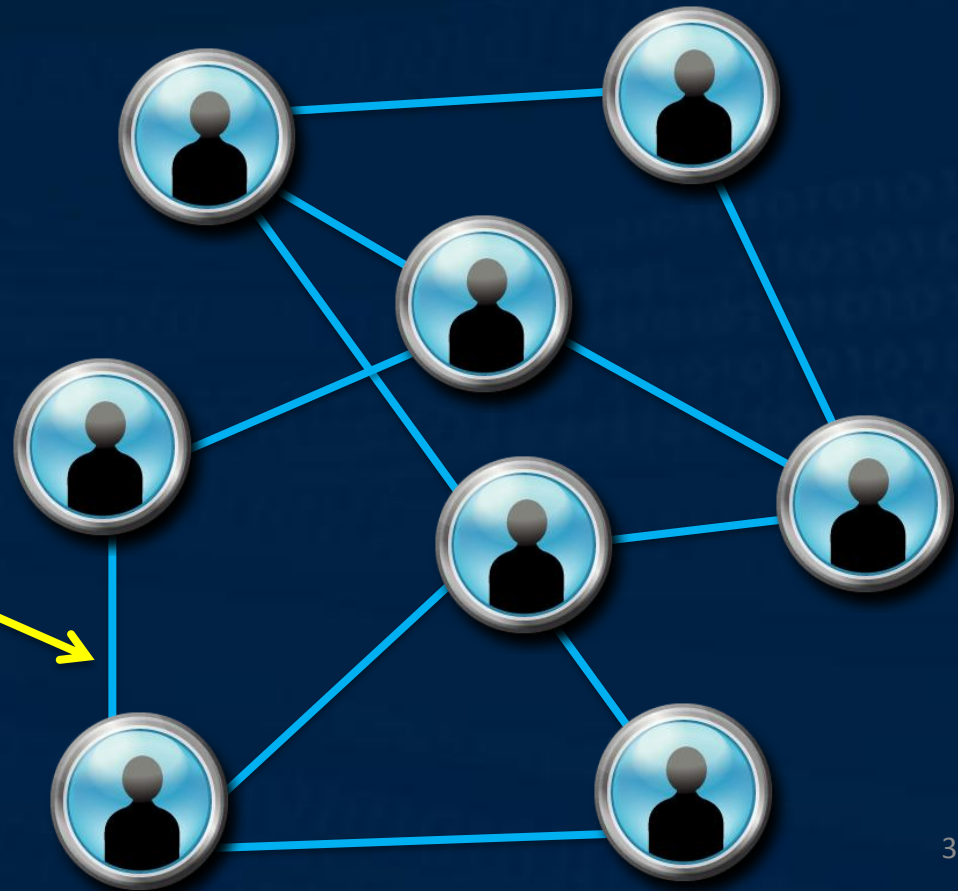
# Project Social Viz

Software that analyzes a social graph to create relations between people and activities by answering queries.

What is a social graph?

Nodes - People

Edges - Relationships



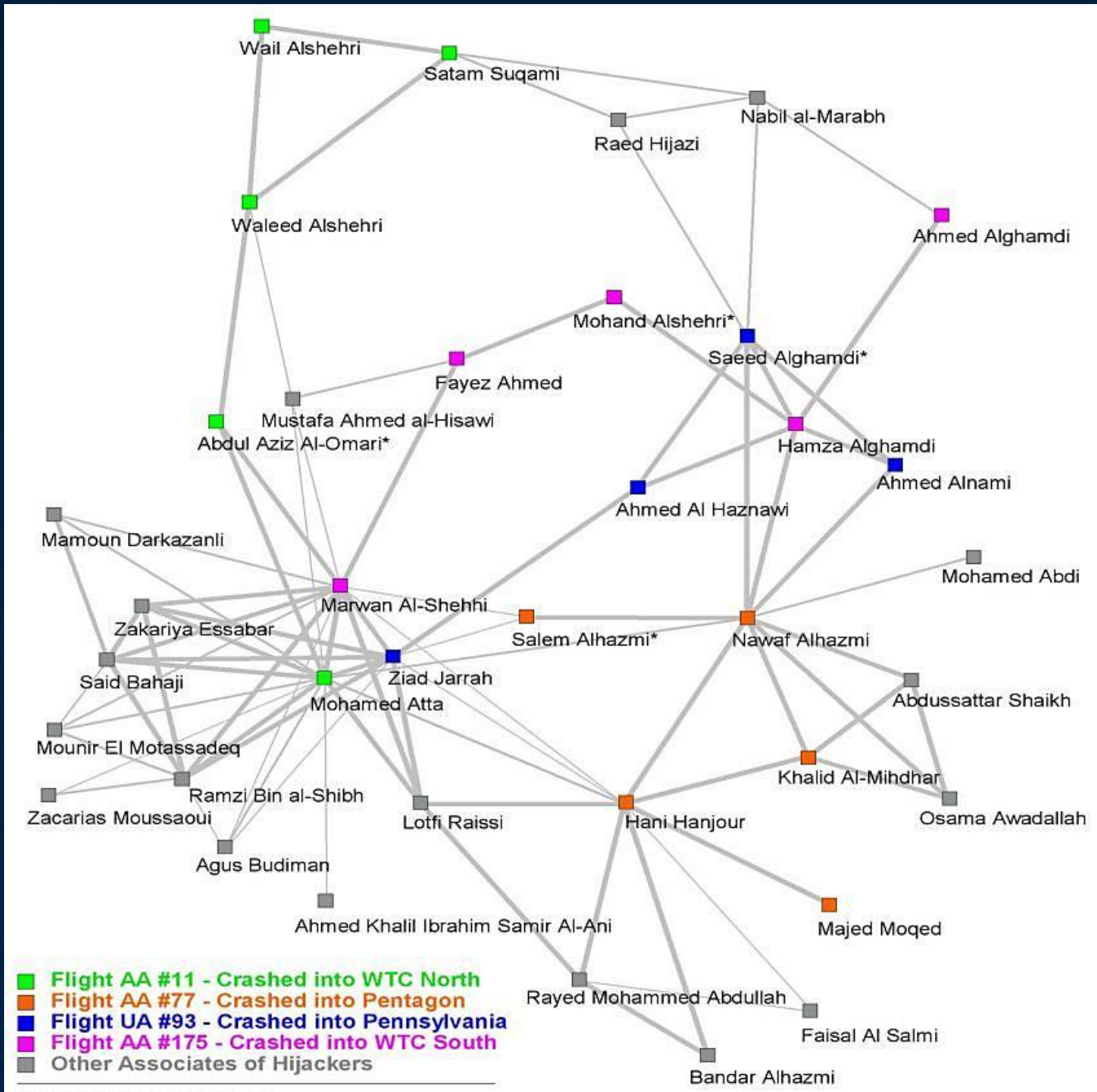
# Real Life Applications:



An example of how Facebook users are interconnected  
Courtesy of Facebook

➤ Improve Target Advertising

# ➤ Analyze Terrorist Network



■ Flight AA #11 - Crashed into WTC North  
■ Flight AA #77 - Crashed into Pentagon  
■ Flight UA #93 - Crashed into Pennsylvania  
■ Flight AA #175 - Crashed into WTC South  
■ Other Associates of Hijackers

Hijacker's Network Neighborhood  
 Courtesy of Valdis Krebs

# Software Objectives

Gephi, Cytoscape, Graphviz and  
Other Visualization Software

Project SocialViz

1. Interactive  
Graph GUI



2. Layout  
Algorithms



3. Node/Edge  
Filtering

4. Server Side  
Interchangeable  
Database

5. Graph Queries

6. Compare Multiple  
Queries Results

7. Social Graph  
Focused

Able to swap in  
different data sets to

Visualize the results

Able to analyze and  
compare results

Can be applied to  
other fields.



# Server – Client Model

Server



Query

Query Results

Client

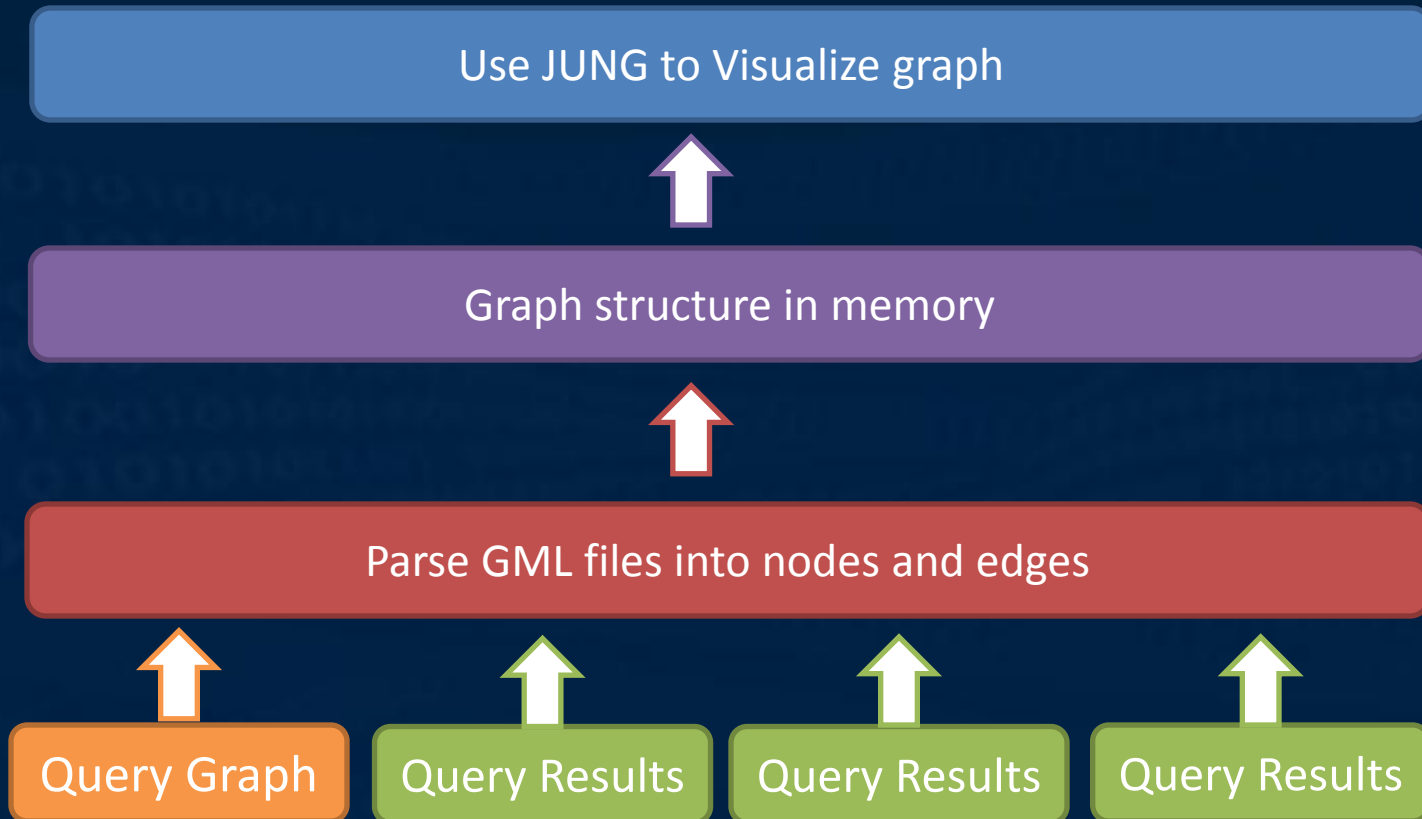


Graph Data  
Base and  
Query  
Algorithms

GUI - Java  
Universal  
Network/  
Graph  
Framework



# Application Side



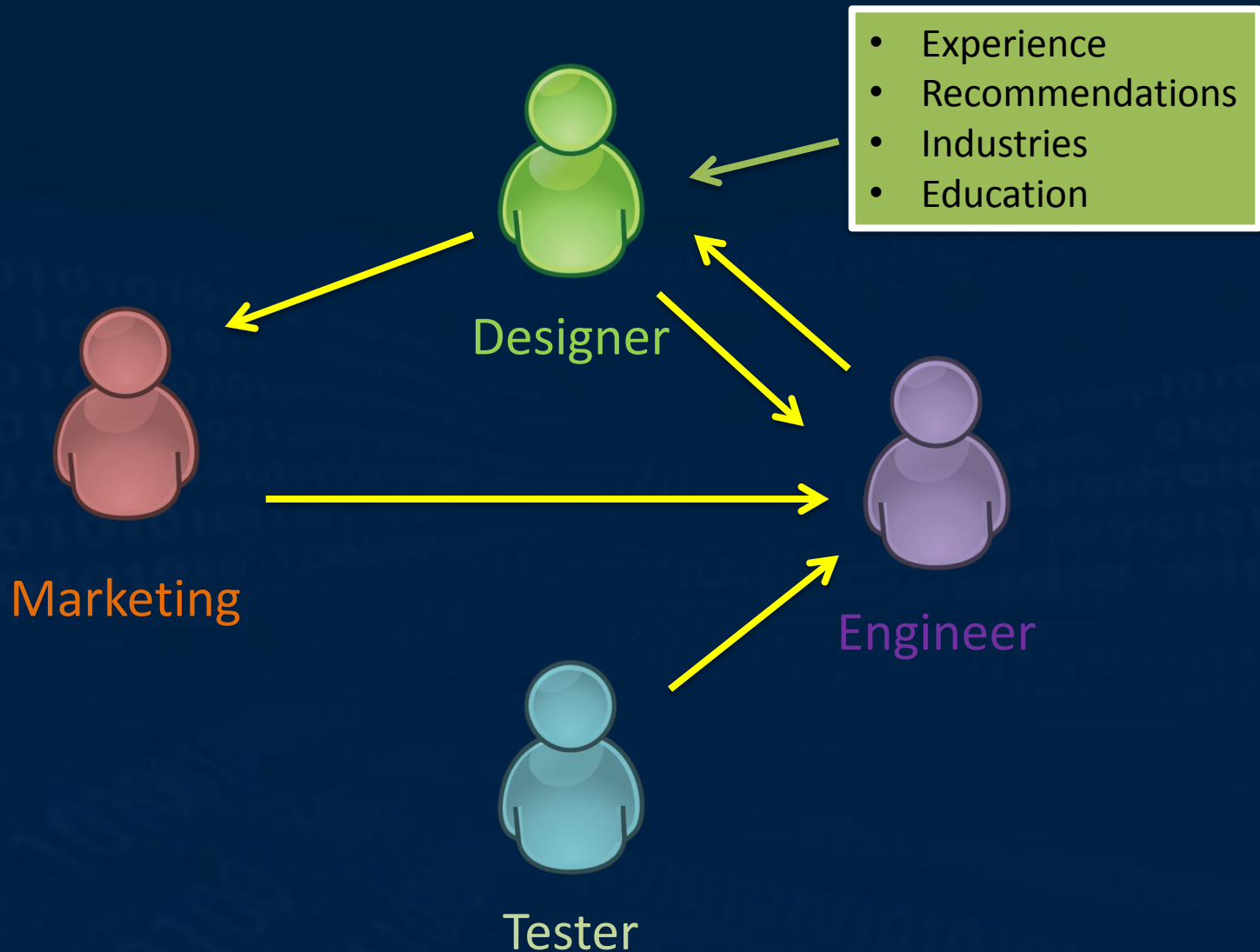


# Subgraph Isomorphism Example

Let's Setup a scenario...

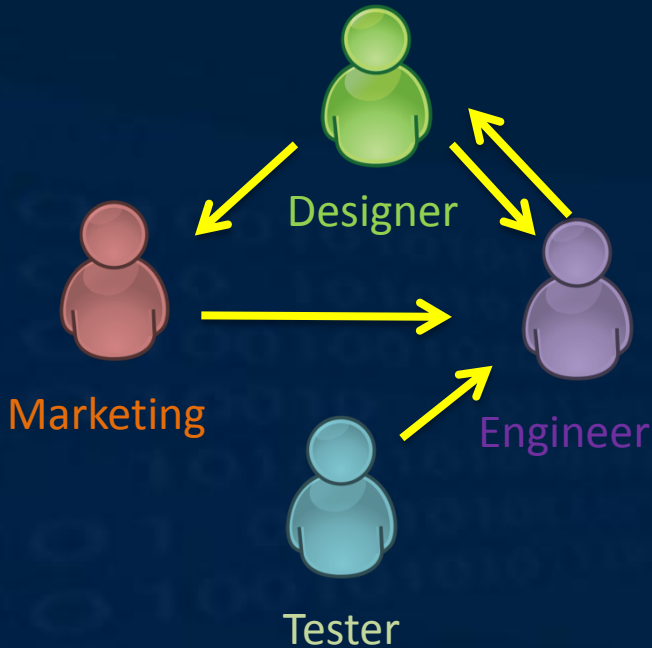
- You are a boss at a company
- Make the perfect product
- Accesses to LinkedIn Network
  - Designer
  - Engineer
  - Tester
  - Marketer

# Subgraph Isomorphism Example

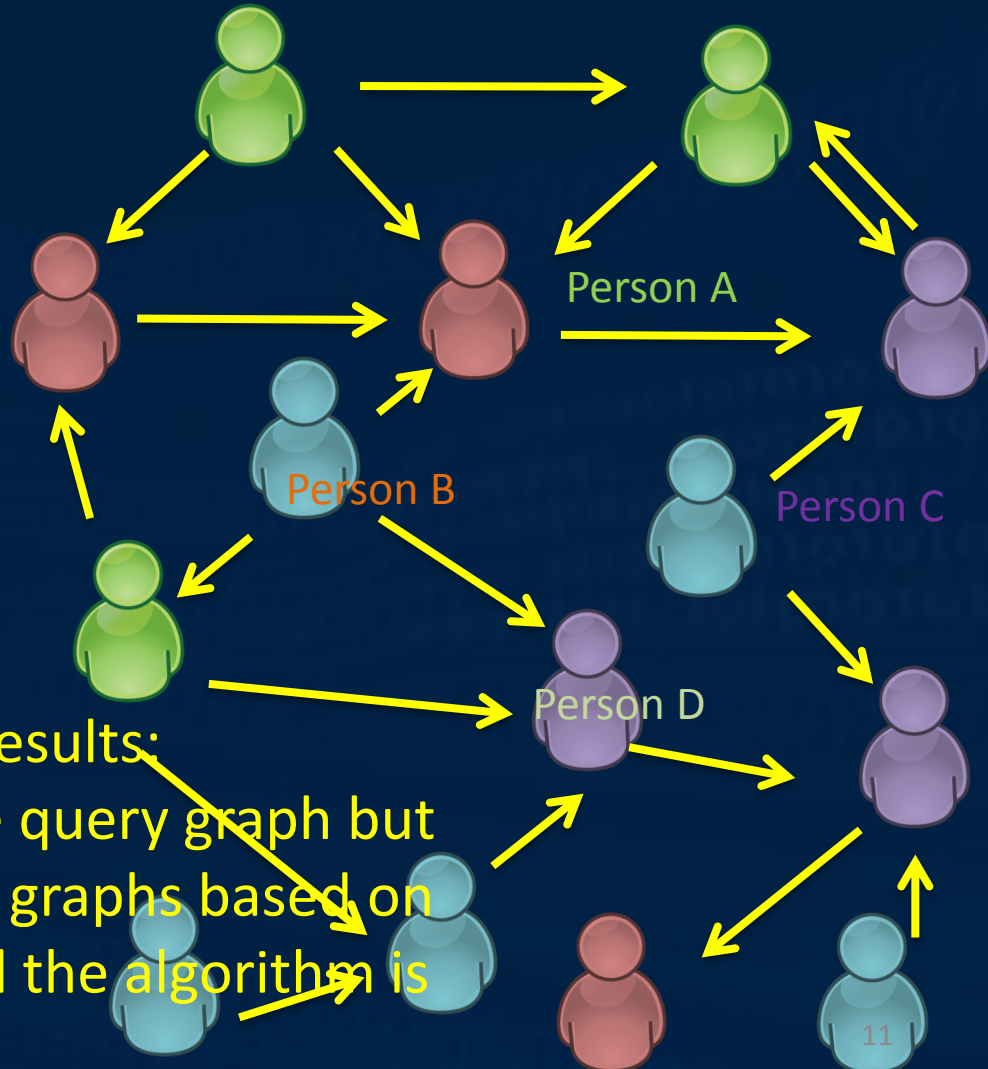


# Subgraph Isomorphism Example

Query



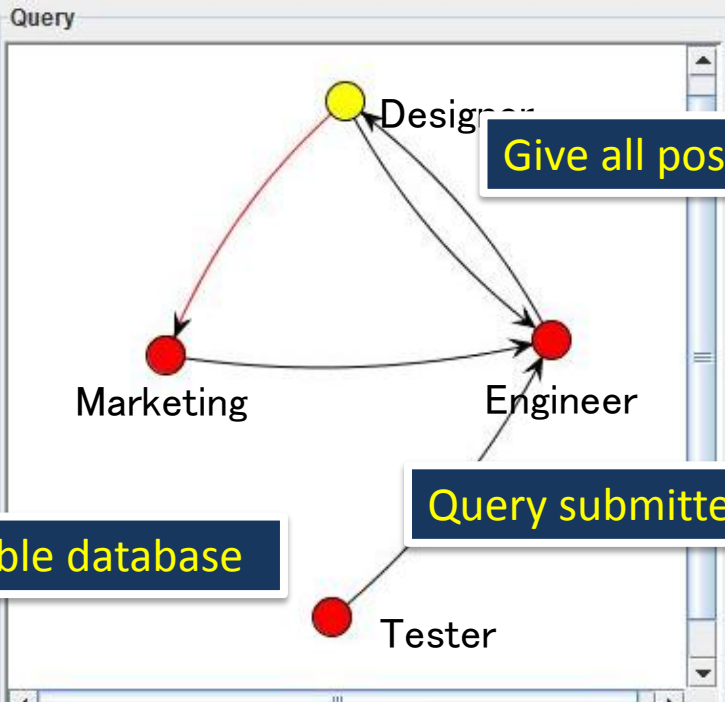
LinkedIn



Results:

Not just one query graph but many query graphs based on how relaxed the algorithm is

- Node List
- 1 - designer
  - 2 - marketing
  - 3 - engineer
  - 4 - tester



Give all possible results

Query submitted

Interchangeable database

- Graph Files
- Linkedin
    - Subgraph Isomor...
    - Data Set
    - Graph Query
    - Graph Query R
    - Graph Query R
    - Graph Query R

Node Information

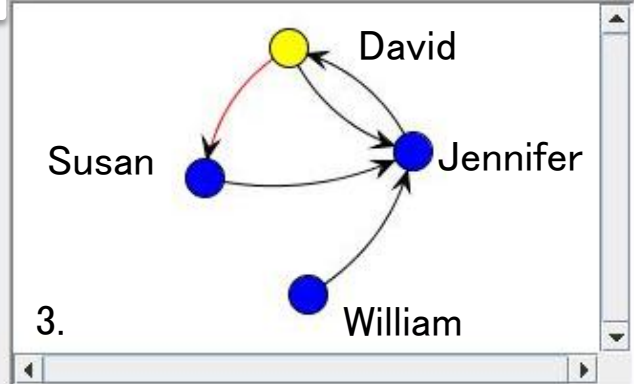
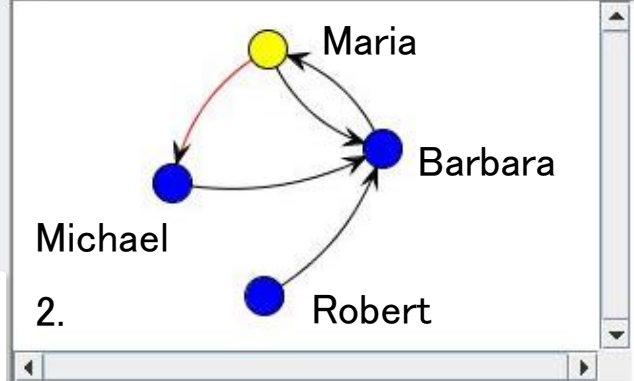
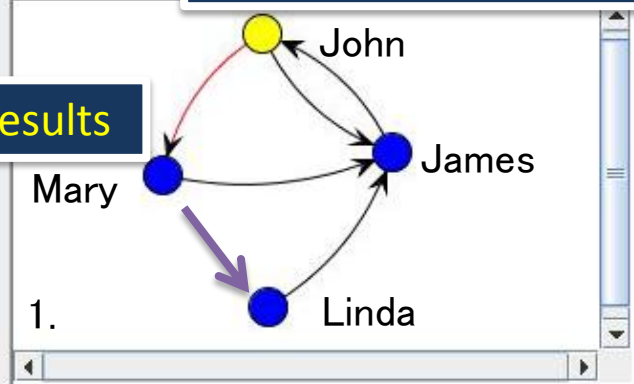
Node Id: 1

Node Label: designer

Node Weig... 0

Show Statistics

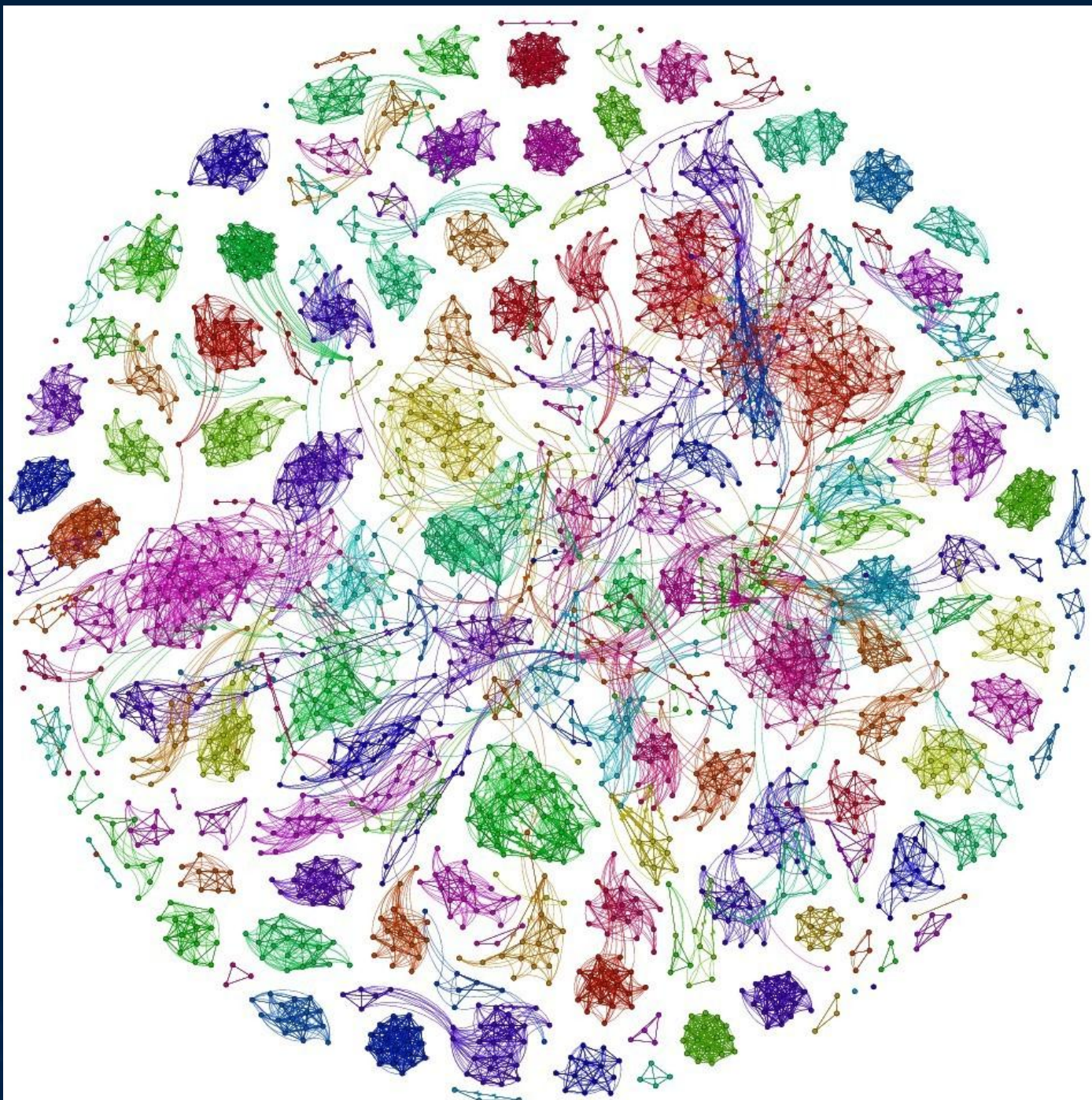
View multiple query graph results



# Future Plans

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

# YouTube Videos





# Project Social Viz

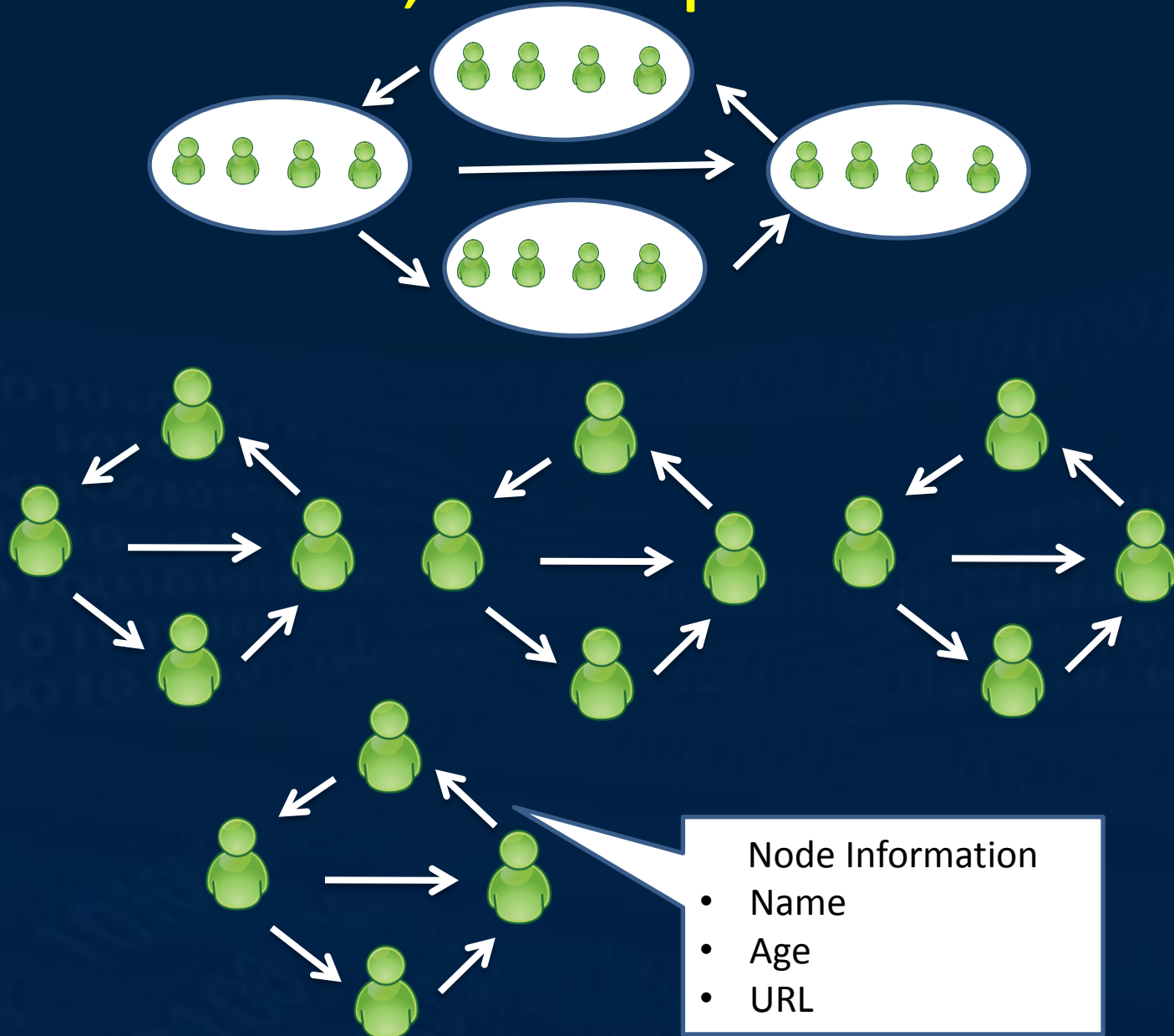
This summer I just created a social graph Visualizer that can analyze social networks at UCSB with the INSET program. I learned a lot from my principle investigator and mentor about research. I also was grateful for the people that pushed and lead me here. 😊

Nick Arnold  
Jens-Uwe Kuhn  
Virginia Estella  
Marilynn Spaventa  
Xifeng Yan  
Yinghui Wu  
& INSET



# Questions?

# Drill-down, Roll-up Mechanisim



# Why Java?

- Strong Object Oriented Language
- Portable
- A lot Third-Party Graph Software Packages
- APIs for Networking, GUI, Database Access



