

SCI 199 Y Jan 11

Presented by: P. Gill

Service learning project reminder

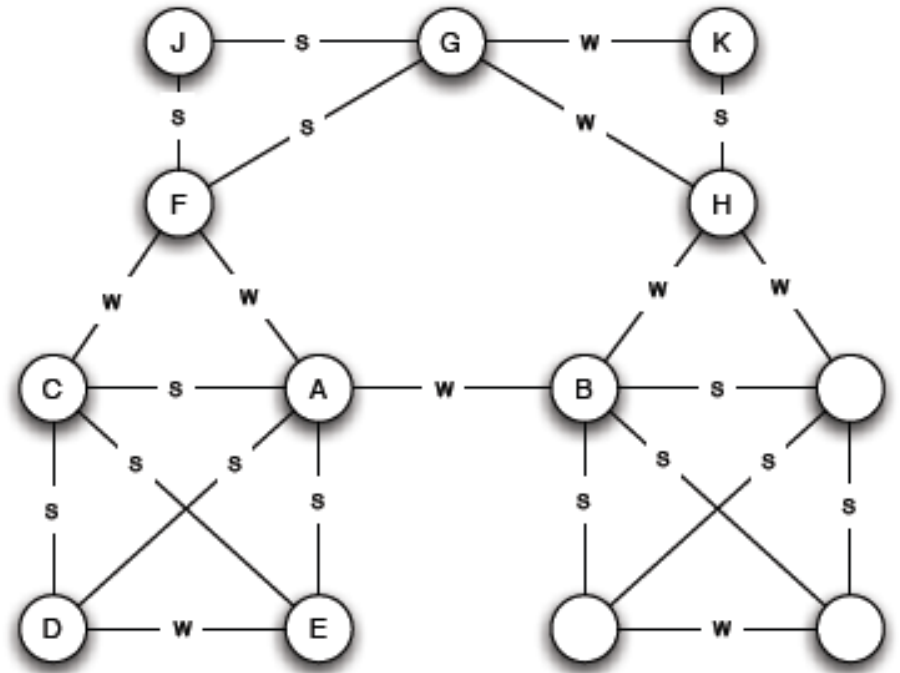
- Send rankings for service learning options!
 - by e-mail before 9pm tonight
 - physically submit them at the end of class
- If no submission is received by 9pm tonight you **will** be **randomly** assigned to an option.

Review:

- *Local Bridge*: an edge joining two nodes A and B in a graph is a *local bridge* if its endpoints A and B have no friends in common.
- *Span* of a local bridge is the distance between A and B when the local bridge is removed
- Relation to *Triadic Closure*: an edge is a local bridge precisely when it does not form a side of any triangle in the graph.
- What is *Triadic Closure*??

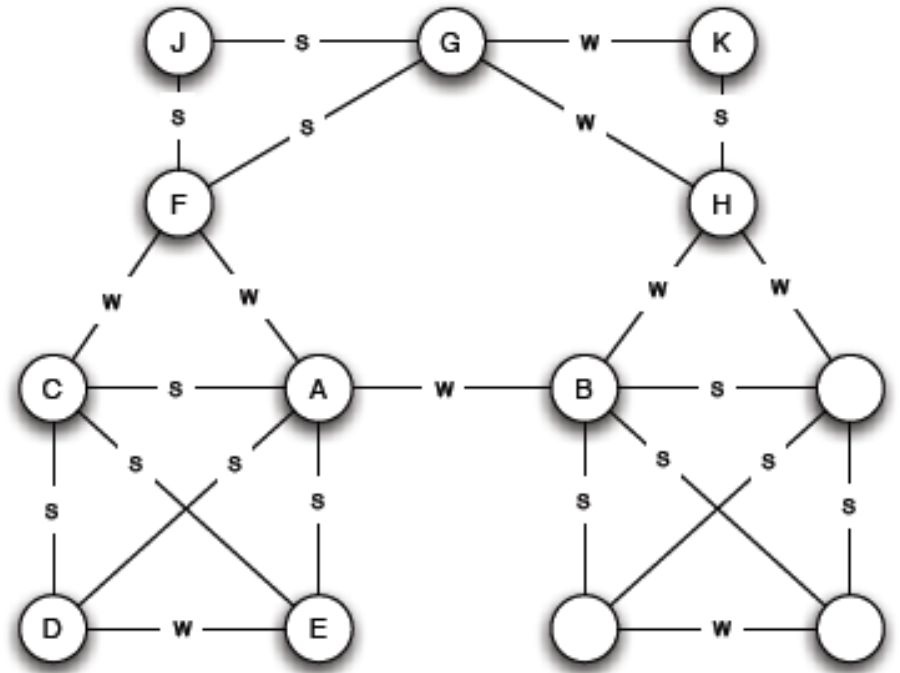
Social Networks

- How do the graph theoretical notions apply to real life?
- Example:
 - Where is the local bridge?



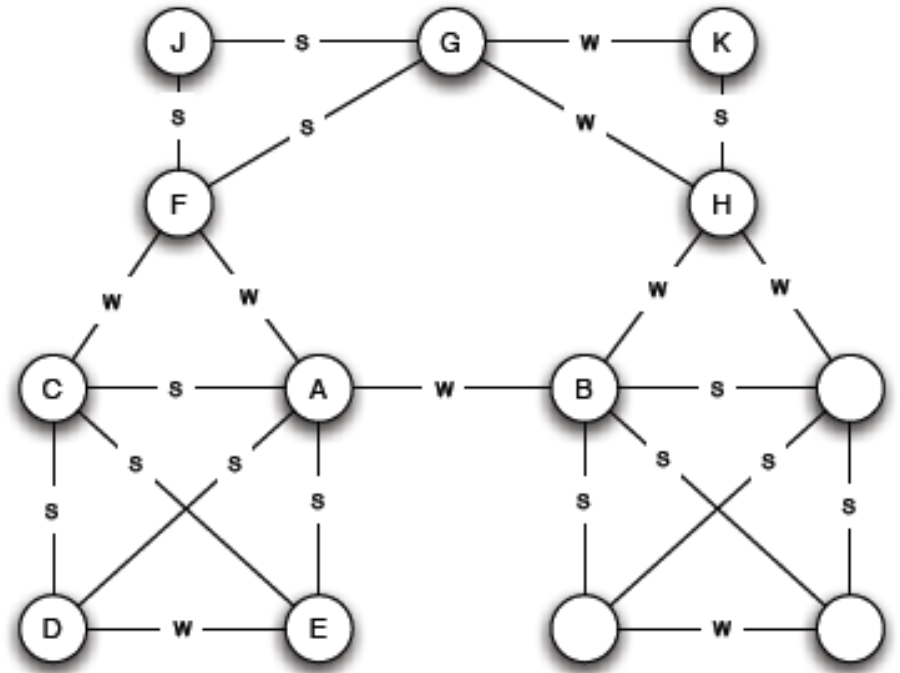
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 - A-B
 - What is its span?



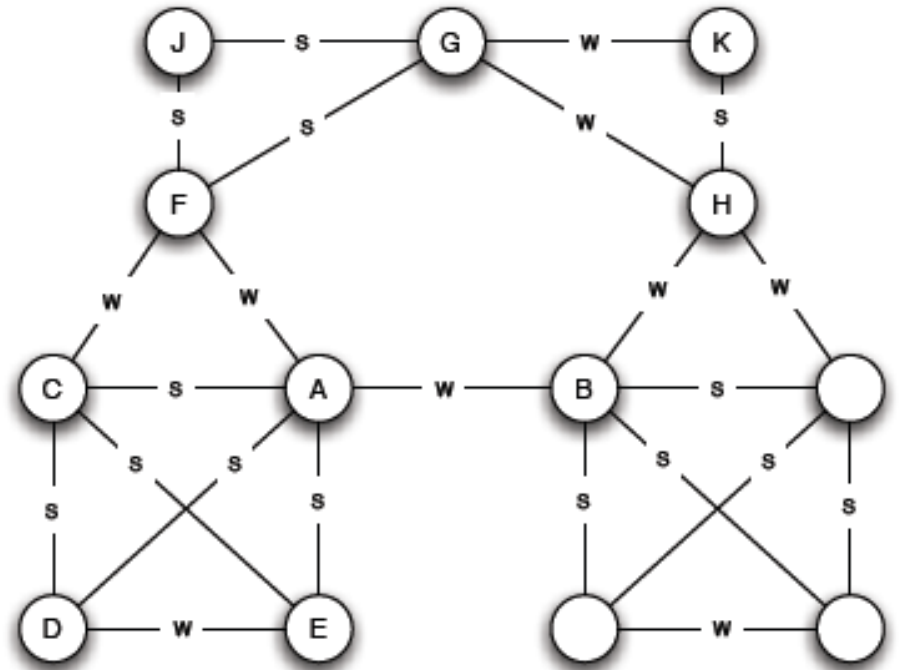
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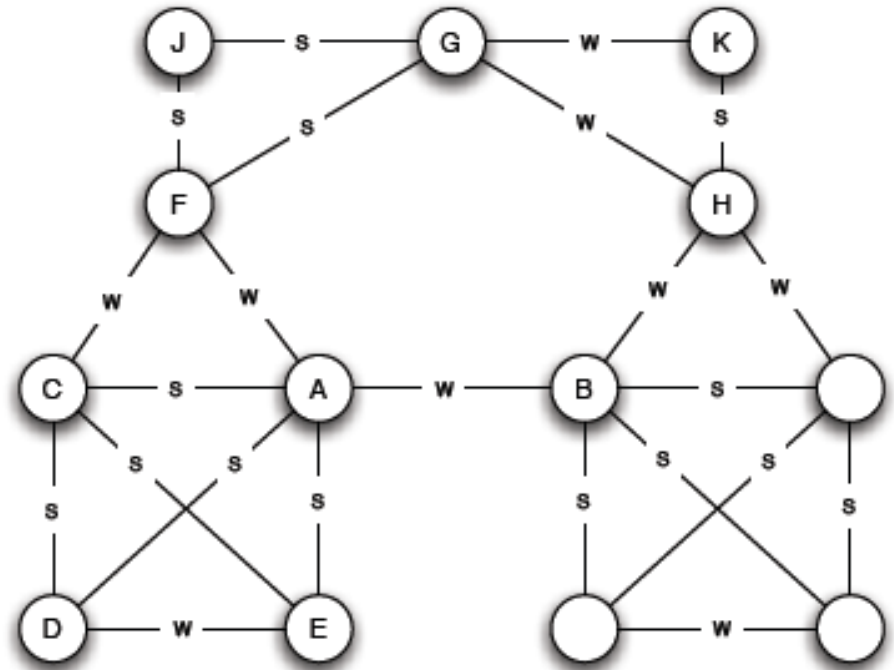
Social Networks

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- What social situation may form a graph like this?



Social Networks

- How do the graph theoretical notions apply to real life?
- Example:
 - Where is the local bridge?
 - A-B
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 - 4
- What social situation may form a graph like this?
 - House party where G invites people from 2 groups of friends (A and B meet at party)

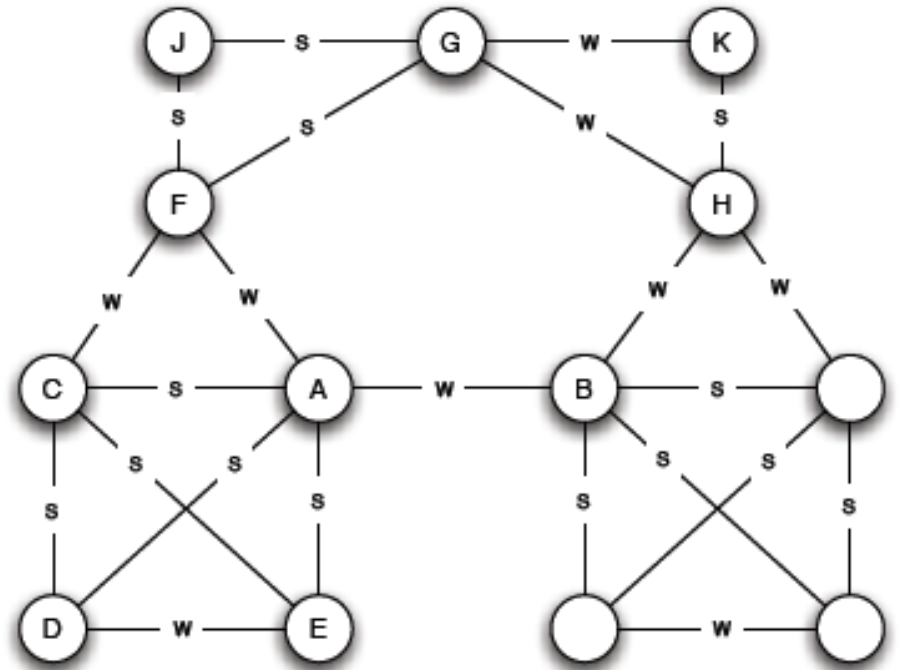


Review:

- *Clustering Coefficient*: Probability that 2 randomly selected friends of A are friends with each other. Fraction of pairs of A's friends that are connected to each other.

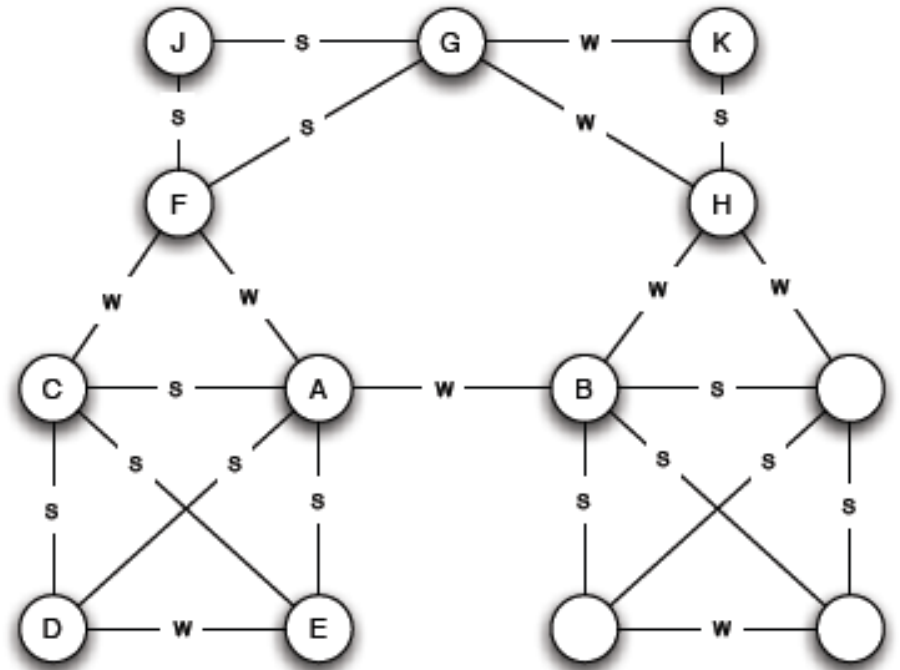
Social Networks

- What is the clustering coefficient of A?



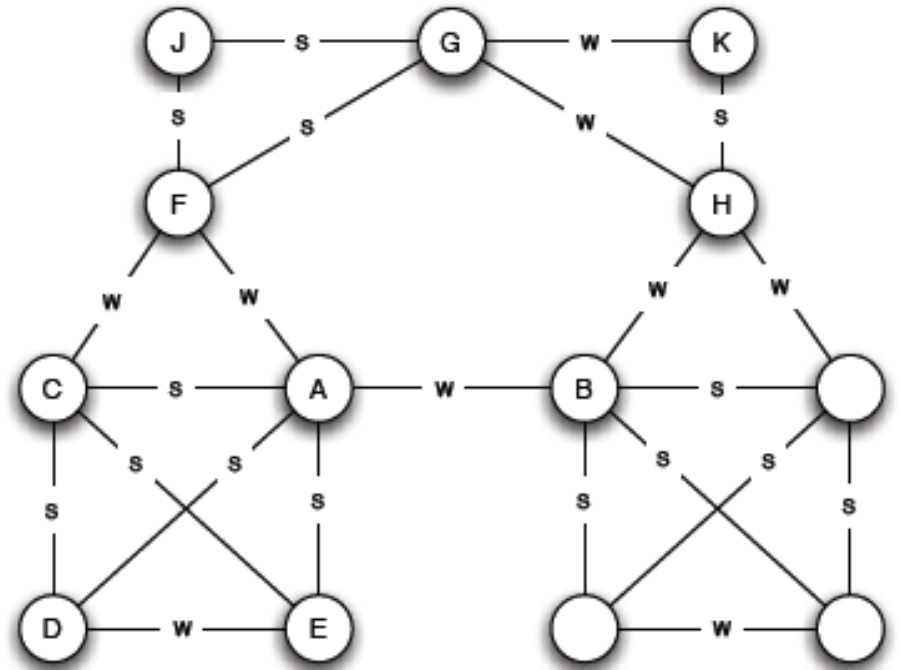
Social Networks

- What is the clustering coefficient of A?
 - Total potential links between A's friends?



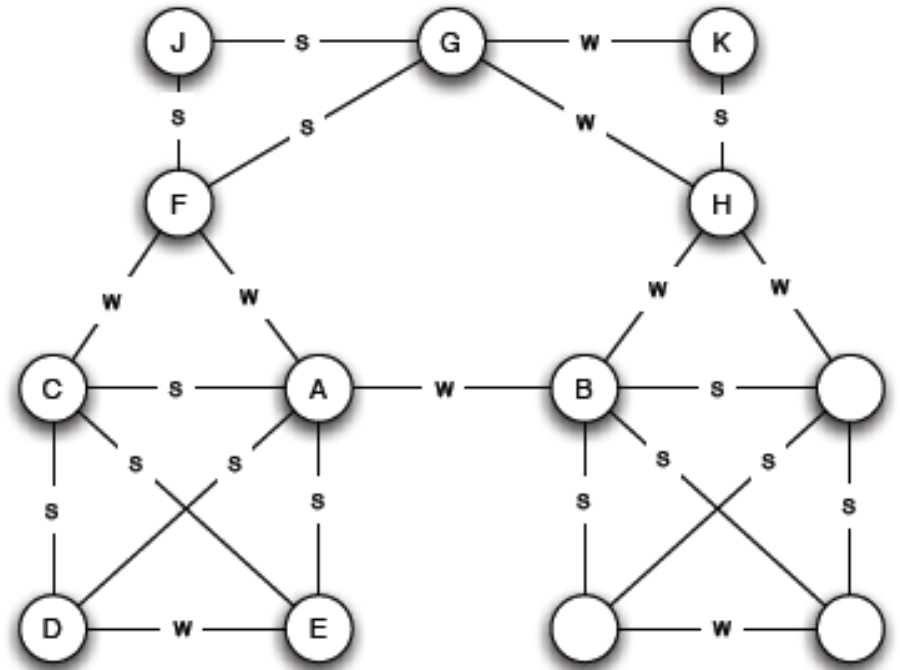
Social Networks

- What is the clustering coefficient of A?
 - Total potential links between A's friends?
 - $5 \text{ choose } 2 = 10$
 - Total links that exist?



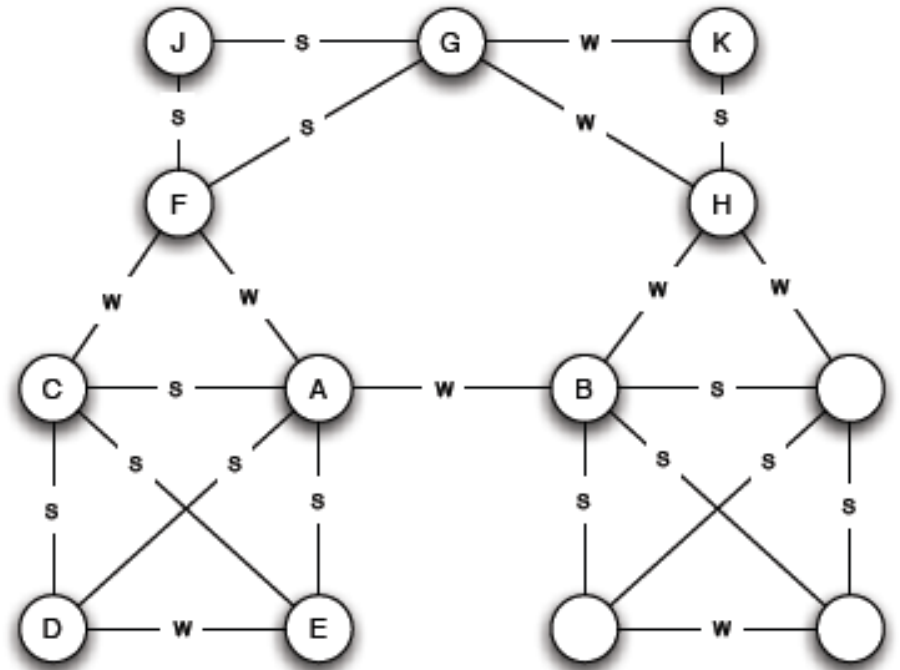
Social Networks

- What is the clustering coefficient of A?
 - Total potential links between A's friends?
 - $5 \text{ choose } 2 = 10$
 - Total links that exist?
 - 4 (C-F, C-E, C-D, D-E)
- Clustering coefficient?



Social Networks

- What is the clustering coefficient of A?
 - Total potential links between A's friends?
 - $5 \text{ choose } 2 = 10$
 - Total links that exist?
 - 4 (C-F, C-E, D-E, C-D)
- Clustering coefficient?
 - $4/10 = 0.4$



Clustering coefficient in real online social networks

Network	Clustering Coefficient
Web pages	0.081
Flickr	0.313
Live Journal	0.330
YouTube	0.136

[Numbers from Mislove et al. 2007]

Note: these numbers are orders of magnitude higher than in random graphs.

- What might explain these differences?
- How do you think your Facebook clustering coefficient might compare?

Social Networking in Action

MIT wins \$40,000 prize in nationwide balloon-hunt contest

December 7, 2009 9:58 a.m. EST



Ten 8-foot-wide red weather balloons across the United States were the targets in Saturday's high-tech challenge.

<http://www.cnn.com/2009/TECH/12/05/darpa.balloon.challenge/index.html>



Social Networking in Action

- DARPA Challenge:
 - Find 10 moored, 8-foot, red, weather balloons at 10 fixed locations in the continental United States, each visible from public roadways.
- How MIT won
 - Web page linked to on MIT page:
 - "We're giving \$2,000 per balloon to the first person to send us the correct coordinates, but that's not all -- we're also giving \$1,000 to the person who invited them. Then we're giving \$500 whoever invited the inviter, and \$250 to whoever invited them, and so on..." it said.

MIT wins \$40,000 prize in nationwide
balloon-hunt contest



Social Networking in Action

- How long did it take?



Social Networking in Action


- How long did it take?
 - Less than 9 hours
- “This contest was designed to test the way social networking and lesser-known Web-based techniques can help accomplish a large-scale, time-critical task.”
- <http://www.cnn.com/2009/TECH/12/05/darpa.balloon.challenge/index.html>

How do you think social networks can help in mission critical tasks?

- What types of tasks can it solve?
- Does the interface (e.g., laptop/cell phone) change the usefulness?
- Are certain types of social networks more useful for this?

More examples of social networks in action

Firsthand Reports From California Wildfires Pour Through Twitter

By Kevin Poulsen  October 23, 2007 | 3:40 pm | Categories: Uncategorized

(
Thanks to [Compiler's Michael Calore](#) for this report.)

San Diego is surrounded by raging wildfires, and local residents are frantic for up-to-the minute news. But with the local media overwhelmed and the national media offering scant details about local services, some crafty web users are turning to Twitter to get the word out.

San Diego residents Nate Ritter and Dan Tentler have been busy posting rapid-fire updates to Twitter as they gather information from friends and roam the streets to offer first-hand reports. The microblogging service, which lets users send out short, burst like updates to a group of friends has proved to be an invaluable tool for distributing information.

Since Monday morning, Ritter and Tentler have been providing updates about evacuations, meeting points, places to gather supplies or bring animals — every shred of information local residents might want



California
Wildfires
& Twitter
Oct. 2007

<http://www.wired.com/threatlevel/2007/10/firsthand-repor/>

More examples of social networks in action

Student 'Tweets' his way out of Egyptian jail

STORY HIGHLIGHTS

- Student James Karl
- Twitter message all
- Now Buck's quest is
- Twitter is a micro-bl

[Next Article in Technol](#)

Apr. 2008

Student arrested
in Egypt

Tweeted 1 word:
"Arrested"

READ

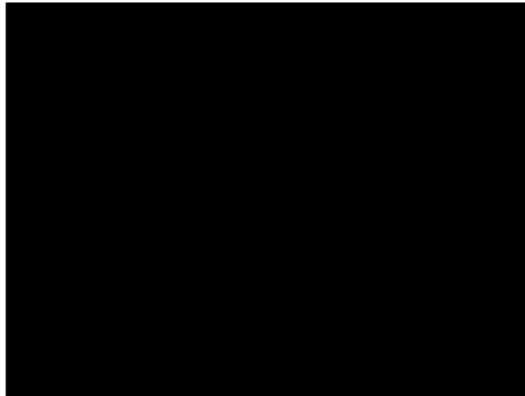
VIDEO

SLIDESHOW

By Mallory Simon
CNN

TEXT SIZE - +

(CNN) -- James Karl Buck helped free himself from an Egyptian jail with a one-word blog post from his cell phone.



James Karl Buck sent a message using Twitter which helped get him out of an Egyptian jail.

Buck, a graduate student from the University of California-Berkeley, was in Mahalla, Egypt, covering an anti-government protest when he and his translator, Mohammed Maree, were arrested April 10.

On his way to the police station, Buck took out his cell phone and sent a message to his friends and contacts using the micro-blogging site Twitter.

The message only had one word. "Arrested."

Within seconds, colleagues in the United States and his blogger-friends in Egypt -- the same ones who had taught him the tool only a week earlier -- were alerted that he was being held.

Twitter is a social-networking blog site that allows users to send status updates, or "tweets," from

<http://www.cnn.com/2008/TECH/04/25/twitter.buck/>

More examples of social networks in action

Officials: Social networking providing crucial info from Iran

June 16, 2009 -- Updated 1756 GMT (0156 HKT)

STORY HIGHLIGHTS

- Officials: Internet is p
- United States has no
- Officials say State D
- Iranian authorities h:

[Next Article in Technol](#)

READ

VIDEO

PHOTOS

TIMELINE

By Elise Labott
CNN State Department Producer

TEXT SIZE

WASHINGTON (CNN) -- U.S. officials say the Internet, and specifically social networking sites like Twitter and Facebook, are providing the United States with critical information in the face of Iranian authorities banning Western journalists from covering political rallies.



An Iranian youth reads a political blog in an Internet cafe.

Because the Iranians have shut down Web sites and closed newspapers, one senior official said, "one of the ways people are able to get out the word is Twitter."

"There are lots of people here watching" at bureaus and offices across the State Department, another senior official said. "There are some interesting messages going up."

Because the United States has no relations with Iran and does not have an embassy there, it is relying on media reports and the State Department's Iran Watch Offices in embassies around the world. The largest such offices are in Dubai, United Arab Emirates; Berlin, Germany; and London, England, all home to large Iranian

Iran
Summer 2009

<http://edition.cnn.com/2009/TECH/06/16/iran.twitter.facebook/index.html>

How to know if any of this would be successful?

- Study of graph properties of online social networks
 - Helps us understand how (and if!) information will flow in social networks
- How might clustering coefficient influence information flow?
- How might bridges influence information flow?
- What can we learn from the bridges span?