Davis Social Links
Leveraging Social Informatics for Cyber Security: Architecture, Implementation, and Applications

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Research Objectives

• **Systems** leveraging Social Informatics
  - How can Social Informatics be maintained and leveraged to handle cyber security issues?
  - *Current* Internet applications and Future Internet Design

• **Social-Centric OS Kernel**
  - How to protect the fairness/value of the Social Informatics/Resource layer?
  - Complement to Social-Centric Internet
Architecture
Email as just an example…
The Implication of FP's

• Spam-filters have to be conservative...

  A: eliminate 99.99% spams, 10% hams
  B: eliminate 60% spams, 0.00001% hams

• We will have some false negatives in our own inboxes.

• We will spend our own time to further filter..
  - For me, 1~2 seconds per email
Dr. Wu,

My name is Eric Simich, I attend Solano Community College; and, I am very interested in the Computer Science field. One person I know who goes to Davis and is involved in the Computer Science major is Justin Howel. He gave me your url and I took a look at some of the interesting powerpoints and homeworks you had available.

I have had practical and technical experience(s) involving Computer Science, Theory, and Implementation. I have had real world application(s) in Network Analysis, Security, and System(s) Administration, but I need to get my degree in order to do anything in the larger computer industry.

I am currently a lab aide in the college's computer lab(s). Previous to employment in the lab(s) I was privately contracting myself out to home businesses, the general public, and anyone who had posted for help in forums. I am good at what I do because I have to take caution in my line of work as it is now, I am not A+ certified, or anything! That is why I am going for a degree, I have passion to drive me through school, but I do not have the connections as far as knowing someone within the field itself, or any teachers to give me advice as needed.

I would really like to jump into Computer Science at university level. I am currently finished with General Ed at the college I am attending right now, but I don't have any of the pre-reqs to apply to Davis yet! I would like to get involved in projects or something, just to gain experience and increase my knowledge/passion towards the field itself.

I am willing to do anything!

Thank you for your time!
Hello Prof Wu,

We'd like to sign up for:
11/26 14-15
11/26 11-12

11/16
11/26
11/27
12/10
/2007
/2007
/2007

In my office

Spammed?

“Memoryless”
For Felix Wu

Justin Howell, jmhowell@ucdavis.edu, 991347775
Jonathan Counihan, jacounihan@ucdavis.edu, I can get his ID later this evening ...

Justin Howell
Telecommunications Network Technician
-----Original Message-----
From: Felix Wu [mailto:sfwu@ucdavis.edu]
Sent: Friday, November 16, 2007 2:57 PM
To: kakkapedd@ucdavis.edu; galdrich@ucdavis.edu; jdallee@ucdavis.edu;
mikaltman@ucdavis.edu; sabafico@ucdavis.edu; eddchan@ucdavis.edu;
ucdchang@ucdavis.edu; sxchen@ucdavis.edu; sscho@ucdavis.edu; jacounihan@ucdavis.edu;
tecnovrsanin@ucdavis.edu; ogdario@ucdavis.edu; cjdavies@ucdavis.edu;
rsdavis@ucdavis.edu; imfont@ucdavis.edu; ahfung@ucdavis.edu; crgilmore@ucdavis.edu;
echa@ucdavis.edu; slhitchcock@ucdavis.edu; dahoffman@ucdavis.edu; zlhout@ucdavis.edu;
jmhowell@ucdavis.edu; jrisaacson@ucdavis.edu; mtjumper@ucdavis.edu;
rwko@ucdavis.edu; mdlauer@ucdavis.edu; ntlee@ucdavis.edu; aleo@ucdavis.edu;
Why is this message different to me?

- Relationship between the communicating entities
- This message is special and personal
  - E.g., not all the professors in the whole world will receive this, BTW.
- There is a difference between content and relationship!
Subject: email for testing
From: ruaylong lee
Date: 10/12/10

Subject: Just testing SoEmail
From: fer.at.bth@gmail.com
Date: 10/7/10

Subject: Re: Testing Thunderbird Plugin
From: uwxilefs@gmail.com
Date: 10/15/10

Subject: Testing Thunderbird Plugin
From: Prantik Bhattacharyya
Date: 10/14/10

Subject: testing 2 without CCing
From: gracewu1963@gmail.com
Date: 10/15/10

Subject: t04 001
From: gracewu1963@gmail.com
Date: 10/15/10

Subject: Test with Mina
From: Jeff Rowe
Date: 10/11/10

Subject: first SoThunder email!
From: S. Felix Wu
Date: 10/13/10

---------------

from gracewu1963@gmail.com
subject t04 001
to jbrove@gmail.com, wu@cs.ucdavis.edu
cc fredrik.e@gmail.com, rezaur@gmail.com

date 10/15/10 15:02

Social Path:
Grace Wu → S. Felix Wu → Fredrik Erlandsson

Spam: Yes

Is this message spam? Yes
No (Will update automatically when you make your selection.)
https://dslcore.slice1054.genislices.emulab.net/soemail/src/login.php

X-DSL 0x15EF2AC4

Social Emails

John - Will - Amy
John - Justin - Felix
John - Mary - Nancy

Eric

Gmail

UC DAVIS

08/01/2011 EuroView 2011
Social Informatics

- The traditional Cyber Security approach
  - Packets, Content, Memory, File, Log
  - Signatures/Anomalies
Social Informatics

• The traditional Cyber Security approach
  - Packets, Content, Memory, File, Log
  - Signatures/Anomalies

• The Social Informatics approach
  - Social relationship/dynamics behind all of them!
  - Signatures/Anomalies at the Social Plane
  - Conjecture - the AMOUNT of social informatics consumed is much more predictable than informatics itself.
How many? within how much time?

• Social capitals/resources
  “anomalous” social transactions

The response from the dark side….

- obtain the expected social profile
- leverage a large number of compromised social bots
- each produce/consume a very small amount of SR
Social Informatics Dynamics

• What is it?

• Social Relationship, it’s really about **quality** and the **context**!

• Interactions **via/versus** Social Relationship
• **Controlling** the Social Relationship based on the Context
Social Informatics

• Leveraged in
  - Emails (Communication), Recommendation Systems, Network security, Wikipedia, Bit Torrent, Search Engine,...
“Kernelization” of Social Informatics

- Managing/Sharing Social Resources
  - Motivation example: Farmville

- Many “Theoretical” Perspectives
  - E.g., game theory, network formation/evolution, privacy/anonymity, trust management

- Our take is the “System” perspective
  - Can we build a good CSI (Computational Social Informatics) kernel to support the realization of general social computing/networking concepts?
We are trying to make the information of social context and relationship explicit!
Simulation study of 100K+ nodes...
DSL ➔ FAITH
Emphasizing Trustworthiness in Social Informatics

08/01/2011
EuroView 2011
Implementation
Facebook API

• How social informatics is being accessed under Facebook?

• REST and GRAPH
Our own Social Informatics Kernel

“Should I have faith in you?”

**FAITH** (**Facebook** **Application** **Identifier** **Translator** & **Hypervisor**) like **NAT (Network Address Translation)**
I-Application
Facebook Applications:
Identification/Transformation/Hypervisor

Facebook/Faith Applications

FAITH

facebook

Facebook
Gmail
Windows XP SP3
Wikipedia
Zynga
Skype
BitTorrent
Farmville and Facebook

FB friends: 790+
FV neighbors: 30+

The “Add me please” push!!!
A Couple Issues

• Careless in adding friends regardless ...
  - Incentive model at the “Facebook” level to balance such a behavior

• Certain Applications are pushing users to accept new friendships unconditionally.
  - But, how do we control the quality of the friendships, at least, in the context of a particular application?
Social Network Transformation

- What is the best/effective VPSN for this application X?
  - Virtual Private Social Network

![Diagram of social network relationships]

- v-friend/neighbor
- FV friend
- FB friend
Social Network Transformation

- Each application might need different OSN topologies.
Facebook wall has been “junked”

• Wall should be an application itself!
• The users need a much better control!

• Should FB itself be a R/W device to SCOSK (such that we can have Twitter and others as well)?
Social-aware “Googling”

- Page Rank along is insufficient
  - Popularity versus Diversity

- Integration of Trust
  - Which SN features are more relevant

- Propagation/Aggregation of Interests/Trust/OSN
  - Proactive push and reactive pull

- Social network itself might depend on “\(K\)"
Design Essentials and the future of website design
Dec 16, 2008 ... After all, a website designer would charge a few hundred dollars for their services, but Design Essentials charges about $9-62 for what they ... www.zmogo.com/design/design-essentials-and-the-future-of-website-design/ - Cached - Similar

Sydney Dance Company - Website Design - Future Büro
Following the appointment of a new artistic director, Sydney Dance Company asked us to overhaul the structure and creative design of their website to make ... www.futureburo.com/work/sydney-dance-company-website-design/ - Cached

What Role Does Emotion Play in Future Internet Design video from ...
In Chapter 15 of 20 software entrepreneur and Borrowed Sugar founder Dan Street shares how making emotional connections online has been difficult and how ... video.answers.com › Technology › Web - Cached

[PDF] Future Internet: A clean slate design?
File Format: Microsoft Powerpoint - Quick View
The Future Internet: A clean-slate design? Nicholas Erho. Current internet architecture cannot fulfill the current demands. The original list of design ...
nsl.cs.sfu.ca/teaching/08/771/talks/erho.ppt

Relationship-Oriented Social-Centric Future Internet Design (2010 ...}
Apr 28, 2010 ... Abstract:Online Social Networks (OSNs) such as Facebook are growing rapidly. On the one hand, OSNs are invaluable in supporting ...
tuba.bth.se/.../Relationship-Oriented-Social-Centric-Future-Internet-Design-2010-04-28 - Cached
Ego-centric Social Network

08/01/2011

Google PageRank

What do we REALLY know about PageRank?

Prantik Bhattacharyya
  - Studied Computer Science at UC Davis
  - Lives in Davis, California
  - In a relationship with Jaya Kunda

Wall

RECENT ACTIVITY

"thanks for sharing this on..." on Lerone Banku's link.

EuroView 2011
Live/News Feeds to Prantik on Facebook

S. Felix Wu
a nice article from Doug Tygar –

Light Blue Touchpaper » Blog Archive » The need for privacy ombudsmen
www.lightbluetouchpaper.org
Facebook is rolling out two new features with privacy implications, an app dashboard and a gaming dashboard. Take a 30 second look at the beta versions which are already live (with real user data) and see if you spot any likely problems. ...

February 9, 2010 at 4:19pm · Like · Comment · Share

Lerone Banks
privacy legislation

How Will The 2 New Proposed Privacy Bills Protect You?
www.socialtimes.com
After months of debate and political wrangling, online privacy legislation is now one step closer with the introduction of two separate bills in the U.S. House. What are the bills about? How do they protect you, the Internet user? The first piece of legislation to hit the House ...

February 14 at 10:27am · Like · Comment · Share

feeds

updates
An earlier experiment

Number of FB Users: 16
Number of User Data crawled: 1374
(i.e. Size of Social Network Crawled)

Total Content Links crawled: 12618
Total Unique Keywords Extracted: 76158 (487706)
Keywords Per Link: 39.13

Next round: 200 ~1000 users
<table>
<thead>
<tr>
<th>Date</th>
<th>Num. Links</th>
<th>Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sun, 10 Jan 2010</td>
<td>349</td>
<td>349</td>
</tr>
<tr>
<td>Tue, 09 Feb 2010</td>
<td>382</td>
<td>33</td>
</tr>
<tr>
<td>Thu, 11 Mar 2010</td>
<td>422</td>
<td>40</td>
</tr>
<tr>
<td>Sat, 10 Apr 2010</td>
<td>441</td>
<td>19</td>
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<tr>
<td>Mon, 10 May 2010</td>
<td>460</td>
<td>19</td>
</tr>
<tr>
<td>Wed, 09 Jun 2010</td>
<td>491</td>
<td>31</td>
</tr>
<tr>
<td>Fri, 09 Jul 2010</td>
<td>535</td>
<td>44</td>
</tr>
<tr>
<td>Sun, 08 Aug 2010</td>
<td>577</td>
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<tr>
<td>Sat, 06 Nov 2010</td>
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<td>1991</td>
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<tr>
<td>Sun, 06 Mar 2011</td>
<td>10320</td>
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</tr>
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</table>
“Preliminary” results

\[ \Delta(e,R) = \frac{\nabla v, w \in R, \omega(v,w)}{|R|^2} \]

<table>
<thead>
<tr>
<th>Measure/Method</th>
<th>Degree-rank</th>
<th>Social-rank</th>
<th>Real-time</th>
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<tbody>
<tr>
<td>diversity</td>
<td>0.1823 [8]</td>
<td>0.2249 [8]</td>
<td>0.2249 [6]</td>
</tr>
<tr>
<td>Page-rank</td>
<td>151</td>
<td>143</td>
<td>77</td>
</tr>
</tbody>
</table>

08/01/2011 EuroView 2011
Sorted by Degree 22 results found 0 milliseconds

G. Felix Wu » Colorado Student Pays His $14,000 College Tuition Bill - In
Even before the recession, college was unaffordable for many Americans. But since state budgets have been slashed and tuition costs are on the rise, more and more students are finding it hard to pa... Read more of this post, Colorado Student Pays His $14,000 College Tuition Bill - In Singles, at Cha
Posted on Wed, 19 Jan 11 20:26:00 +0000

Palash Dey » Mamata draws flak for pending railway projects | Manata Bane
NEW DELHI: Railway Minister Mamata Banerjee on Tuesday came under attack from opposition members for incompletion of projects. Intervening in the debate on Railway Budget in the Rajya Sabha, Mamata Banerjee said that she appreciated a suggestion to name one of the trains after Rani Lakshmi Bai, the g
Posted on Wed, 09 Mar 11 08:44:15 +0000

Lerone Banks » Obama Should Be Ashamed of His Budget | BuzzFlash.org
This freeze would cut the deficit by more than $100 billion over the next decade, bringing this kind of spending -- domestic discretionary spending -- to its lowest share of our economy since Dwight Eisenhower was President. Let me repeat that....
Posted on Thu, 17 Feb 11 18:56:16 +0000

Ken Gribble » Tea Party Caucus Takes $1 Billion In Earmarks – Hotline On C
Members of the Congressional Tea Party Caucus may tout their commitment to cutting government spending now, but they used the 111th Congress to request hundreds of earmarks that, taken cumulatively, added more than $1 billion to the federal budget.
Posted on Wed, 15 Dec 10 23:18:14 +0000

Shaozhi Ye » Colorado Student Pays His $14,000 College Tuition Bill - In
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Posted on Thu, 20 Jan 11 00:31:44 +0000
Social Rank/Diversity

**Satabdi Das**  »  * Gates, Buffet & the Art of Giving*

The latest Forbes billionaires list is out. A mere 10 per cent return on the wealth of Indians in it would cover Health, Higher Education, MGNREGS and Handloom budgets for years and years.

*Posted on Sat, 12 Mar 11 05:42:32 +0000*

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**Michael Clifford**  »  * 20 lies (and counting) told by Gov. Walker | Russ' Filthor*

We’re used to politicians stretching the truth, but the level of deception and dishonesty Wisconsin’s governor has exhibited in the battle over his union-busting budget repair bill (even the name is a falsehood) sinks to astounding new lows. What follows are the 20 lies I’ve identified in a quick r...

*Posted on Sun, 06 Mar 11 10:28:17 +0000*

**Pritha Basu**  »  * Budget 2011: 100% salary hike for anganwadi workers - The Ti*

For senior senior citizens, exemption age limit has been reduced from 65 to 60. Those above 80 years will be exempt from tax up to Rs 5,00,000.

*Posted on Mon, 28 Feb 11 07:56:37 +0000*

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*...*
Freshness

Sorted by Time 22 results found 0 milliseconds

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Michael Clifford » Scott Walker smuggles ringers into the capital for the legis
The Awl's Abe Sauer is at the Wisconsin state house with press credentials, and he describes the scene after rogue governor Scott Walker defied a court order and violated state law by locking the public out of the capitol. But then something even weirder and creepier happened: a cadre of out-of-town
Posted on Thu, 03 Mar 11 16:38:49 +0000

Pritha Basu » Budget 2011: 100% salary hike for anganwadi workers - The Ti
For senior senior citizens, exemption age limit has been reduced from 65 to 60. Those above 80 years will be exempt from tax up to Rs 5,00,000.
Posted on Mon, 28 Feb 11 07:56:37 +0000

Michael Clifford » Wisconsin Power Play
Whatâ€™s happening in Madison isnâ€™t about the state budget.
Posted on Mon, 21 Feb 11 19:53:25 +0000
Remarks

**Social Computing Paradigm**
Applications (or routers/gateways) consuming SI

**Trustworthy Social Informatics**
Architecture/Design/Implementation

**Impact to Real World Applications and Society?**
how to evaluate?