

Online Social Nets & Real Life

Jon Crowcroft

<http://www.cl.cam.ac.uk/~jac22>

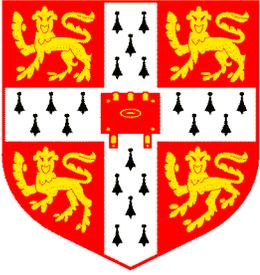
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+447733 231822

+linkedin, facebook, myspace



We meet, we connect, we communicate

- We *meet* in real life in the real world
- We use text *messages*, phones, IM
- We make *friends* on facebook, Second Life

- How are these **related**?
- How do they **affect** each other?
- How do they **change** with new technology?



I have 100M bytes of data, who can carry for me?

Don't give to me! I am running out of storage.



There is one in my pocket...



Search La Bonheme.mp3 for me



Search La Bonheme.mp3 for me



Search La Bonheme.mp3 for me



Thank you but you are in the opposite direction!

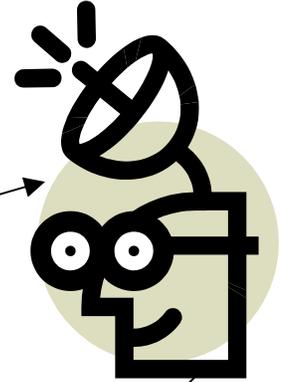
Give it to me, I have 1G bytes phone flash.



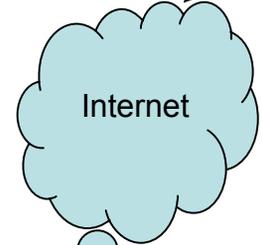
I can also carry for you!



Reach an access point.

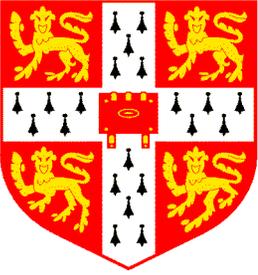


Internet



Finally, it arrive...



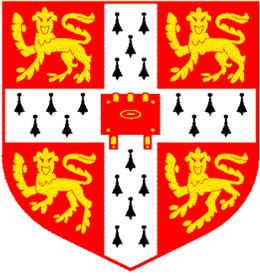


My facebook friendswheel



2009

Social Networks Online and in Real Life



My email statistics!

Firefox File Edit View History Bookmarks Tools Window Help

Google Mail - Inbox (34778) - crowcroft@gmail.com

http://mail.google.com/mail/?ui=2&shva=1#inbox

Most Visited Getting Started Latest Headlines Apple Amazon eBay Yahoo! News

Facebook Home Google Mail - Inbox (34778) Blogger: Dashboard BBC NEWS | News Front Page 1-Way Aerial Amplifier Mozilla Firefox Start Page Capture a Screen Shot with

Mail Calendar Documents Photos Reader Web more crowcroft@gmail.com Settings Older version | Help | Sign out

Engadget - Denon jumps in the vinyl-to-MP3 turntable game with DP-200USB - 1 hour ago

Archive Report Spam Delete More Actions Refresh 1 - 50 of 39205 Older Oldest

Select: All, None, Read, Unread, Starred, Unstarred

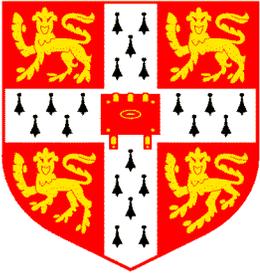
Sender	Subject	Time
Alan, Frank, Jon, Neil (4)	[Response requested] Teaching Planning - To: all Computer Laboratory Schedule J teaching staff. As I mentioned in the Wednesday Meeting ...	9:34 am
Marshall .. Gunter, Stig (7)	[MBONED] WGLC on SSMPING - We have been asked by Stig about this and feel that SSMPING is ready for WGLC. Please comment on ...	9:30 am
Aaron, Ted, Jon (3)	[discuss] GENI System Requirements - On Mon, Oct 20, 2008 at 03:31:22PM -0400, Aaron Falk wrote: > GENI System Requirements ...	9:10 am
Sue, Jon (4)	quick question on highly utilized links - Hi Jon, How's it going? I've got a quick question that I thought you might have an answer ...	9:09 am
ken, R. Jon (16)	IPv10.0 paper - attached is the white paper I sent over to Darpa on IPv10. Its rather informal in some places and ...	9:09 am
Cecilia Mascolo	Re: sensor posters any one? - yes On 22 Oct 2008, at 07:21, Jon Crowcroft wrote: > Forwarded Message ...	9:04 am
Nishanth, Jon (2)	thesis plan thoughts - Hi Jon I am still in the middle of rewriting thesis plan, but here are the two options in my head ...	8:57 am
Helen, Jon (2)	Vodafone Lecture, February 2009 - Dear all I have provisionally booked The Royal Academy of Engineering's in-house lecture ...	8:55 am
Mahesh Marina	PhD position in Edinburgh - Dear all, I am writing to seek your help in finding a UK/EU candidate for a fully funded PhD ...	7:55 am
COMNET	Notification of ACCEPTANCE Decision for COMNET-D-08-2716R1 - Dear Dr. Crowcroft, For this manuscript Performance Evaluation of Data-Centric Information ...	7:45 am
Parviz .. Steven, Paul (4)	[ita-alliance] Downloading files from ITACS - Dear All; I have received a number of e-mails/calls indicating many of you have problem in ...	7:39 am
George, Steve (4)	Your CL visit - Just talking to Jon Crowcroft. He and I could do a 4 pm meeting this Friday (17th). Followed by a ...	5:23 am
Polyzos, George, George (3)	WCM-08-0007.R1 - Invitation to review - Dear Jon, I'm sure you have various reviewing assignments, but would you consider taking a ...	5:04 am
Ian .. Neil, Ian, Richard (8)	FIPR Alert: GAK notice decision - You have received this message from the "FIPR Alert" mailing list run by the Foundation ...	12:32 am
Info (2)	ICST - SIMUTools'09: Call for papers - Submission deadline EXTENDED to November 2 - Our apologies if you receive multiple copies of this message) due to the numerous requests	11:52 pm
Rashid Mehmood	Reference Request from Surrey - Hi John, University of Surrey, Centre for Communication Systems Research (CCSR) has shortlisted ...	11:05 pm
S.Aleva	CCNR & Barabási Lab Announcements - Center for Complex Network Research (CCNR) CCNR tenure-track position Assistant Professorship in ...	11:05 pm
BB-ubicomp .. Marta (5)	[grandchallenge] October 30th/31st retreat @ Crowne Plaza hotel, Nottingham - Dear all, I have the following names confirmed for the above retreat, aimed at working on follow ...	10:48 pm
Facebook	direct Babak Ayazifar also commented on Randy Howard Katz's posted item... - Babak also commented on Randy Howard Katz's posted item: "She may shut down all of ...	10:42 pm
M. Mallya	Wolfson Wine Tasting - this saturday - Welcome to Wolfson Wine Tasting. We will be kicking off this year with our first tasting this ...	9:58 pm
BB-ubicomp, Jon, Morris (3)	[grandchallenge] Workshop funds application for consideration - I think I can see the relevance of a workshop on Sensory Augmentation Research and that it ...	Oct 21
Amy Mokady	Do you have a project with commercial potential? - i-Teams are currently looking for projects for i-Teams for Lent and Easter terms (www ...	Oct 21
Peter Sewell	lab TSG/ARG/CPRG research groups i-> PLS - Dear all, this is just to let you know that we've tidied up the structure of the lab ...	Oct 21
The IESG	Last Call: draft-ietf-isis-wg-extisp (Simplified Extension of LSP Space for IS-IS) to P... - The IESG has received a request from the IS-IS for IP Internets WG (isis) to consider the ...	Oct 21
The IESG	Last Call: draft-ietf-isis-hmac-sha (IS-IS Generic Cryptographic Authentication) to Pro... - The IESG has received a request from the IS-IS for IP Internets WG (isis) to consider the ...	Oct 21
Scott, Avri (3)	Re: from the Firefly guy - On 10/20/08 10:59 PM, Stev Knowles allegedly wrote: >> joss whatever ... > http ...	Oct 21
Gorry Fairhurst	[MBONED] WGLC on SSMPING - Comments on draft-ietf-mboned-ssmping-05.txt - I have read version -05 of the ssmping spec, and see the following: 1) I think this protocol is a ...	Oct 21
Tesco.com	25% Off All Top 40 Chart Downloads When You Buy Anything In Store! - If this email is not displayed correctly, please click here. To ensure that your Tesco emails get ...	Oct 21
ENASE Secretariat	CFP ENASE-2009 (Milan - Italy) - 4th International Conference on Evaluation of Novel Ap... - Dear Jon Crowcroft, We invite you to submit a paper to ENASE-2009 (the 4th Internation	Oct 21
Ronnie Sant	Last Chance to Attend - Get a Complimentary All-Access Pass for the 2008 Financial Serv... - Last Chance to Attend Get a Complimentary All-Access Pass 2008 Financial Services	Oct 21
Mark Kirstein	P2P Traffic to Grow Almost 400% over the Next 5 Years, as Legitimate P2P Applications B... - MultiMedia Intelligence Brief P2P Traffic to Grow Almost 400% over the Next 5 Years, a	Oct 21
Jon, Kylie (2)	kelly joe Phelps - awesome slide guitar/voice - just caught him on a bbc series about "guitar heroes" but he's really standout ...	Oct 21
rfc-editor	RFC 5372 on Payload Format for JPEG 2000 Video: Extensions for Scalability and Main Hea... - A new Request for Comments is now available in online RFC libraries. RFC 5372 Title:	Oct 21
rfc-editor	RFC 5371 on RTP Payload Format for JPEG 2000 Video Streams - A new Request for Comments is now available in online RFC libraries. RFC 5371 Title: RTP Payload ...	Oct 21
rfc-editor	RFC 5344 on Presence and Instant Messaging Peering Use Cases - A new Request for Comments is now available in online RFC libraries. RFC 5344 Title: Presence and ...	Oct 21
rfc-editor	RFC 5254 on Requirements for Multi-Segment Pseudowire Emulation Edge-to-Edge (PWE3) - A new Request for Comments is now available in online RFC libraries. RFC 5254 Title:	Oct 21
Orlando	Get free deliveries with Orca do on Demand - Having trouble reading this email? View the web version Orca do Home Wines Ideas Offers Recipes	Oct 21

Find: topolo Next Previous Highlight all Match case

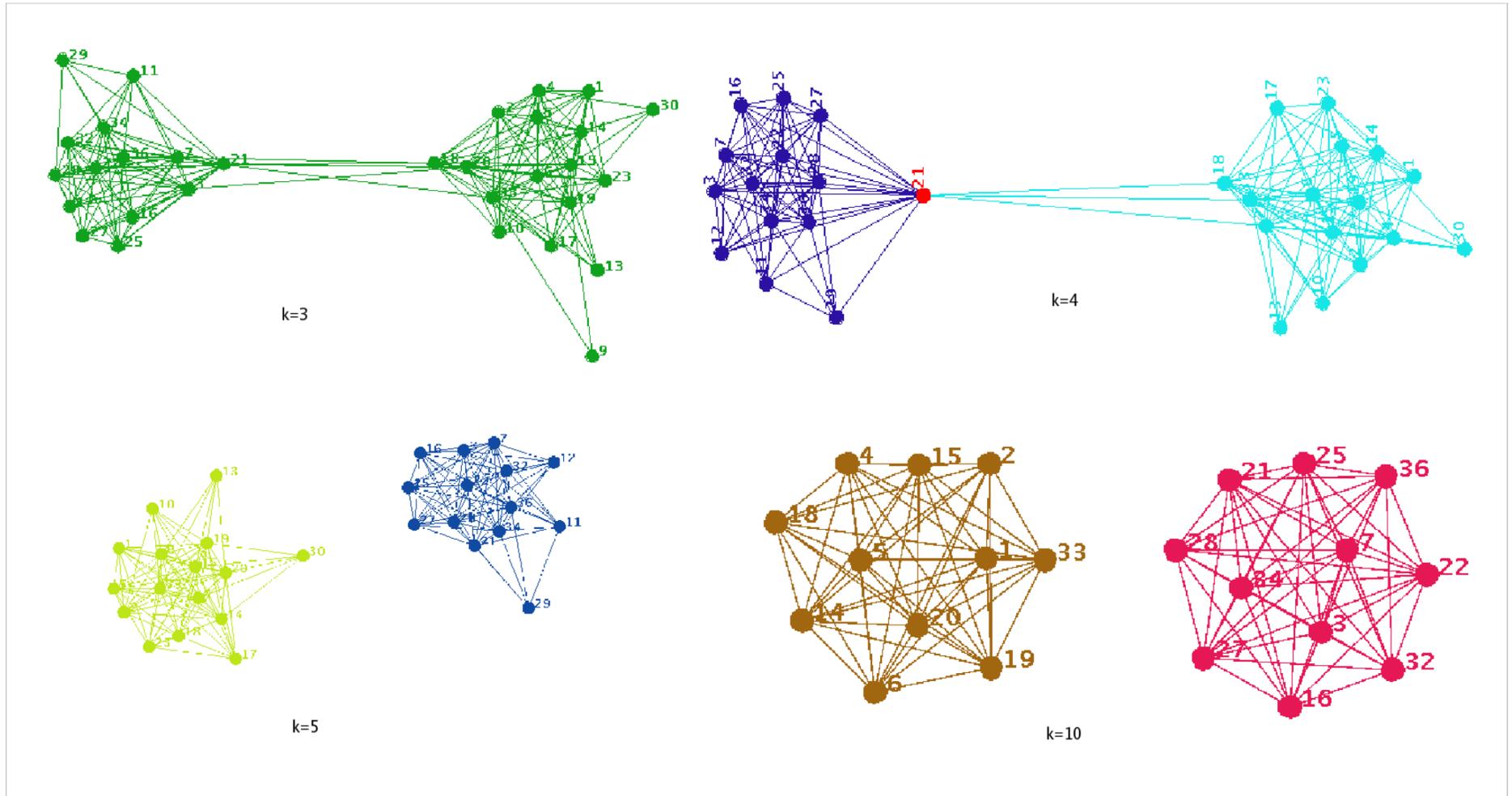
Done

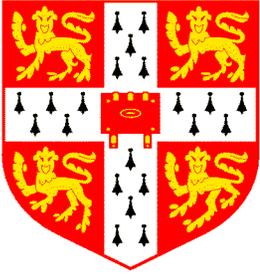
2009

Social Networks Online and in Real Life



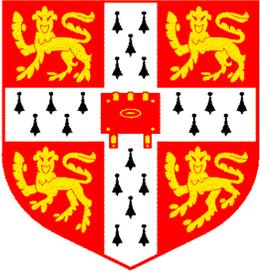
Cliques and Communities





Dunbar's Number & Trust

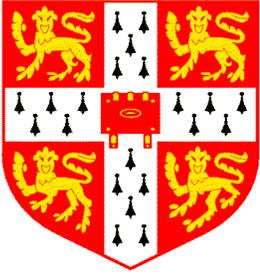
- Dunbar's number:-150 (for humans)
 - Size of simple communities of humans
 - Reflects ability to cope with group
 - Humans gossip rather than physical grooming
 - Language lets us abstract
 - We can reason up to 5 levels of intentionality
 - (Shakespeare does 6 :-)
- $T = 1 / [3.x^N]$
 - T is trust metric
 - 3.x is a number between 3 and 4
 - N is distance in social net



Conjecture on N?

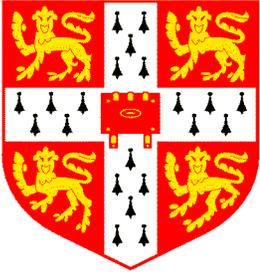
- $N = 0 = \text{Kin (sex)}$
- $N = 1 = \text{friends (beer/drugs)}$
- $N = 2 \text{ or more} = \text{acquaintances (dancing/music/laughing at same jokes)}$

- How does this help in facebook?



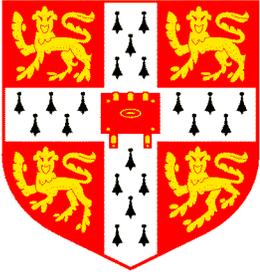
Conjecture on Online v. Real

- We're looking at co-lo networks
 - c.f. hagggle, cityware - bluetooth etc
- AND online social networks
 - Friendship graph on orkut, li, facebook
- AND communication networks
 - Email address book, sms, phonecalls
- Can use to infer real relationship
 - I.e. type of edge in graph (and value of N)



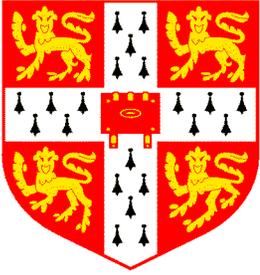
Conjectures on Trust

- Trust in terms of revelation/disclosure
 - Or carrying data (in ferry net)
 - Or simple automated/default grouping for ACLs
- Need to do some experiments
 - Figure out how ties are broken
 - Forgetting
 - How new tools/technology affect
 - Size and dynamics of social net...



EU Social Net Project Questions

- What net/edge type is more likely to cause an edge in another net?
 - Does meeting someone dominate over online or vice versa -
 - i.e. how does new tech affect x (size of immediate gang) and
 - N (scope of gang/level of intentionality reasoning?)?
 - Can you use this to detect dodgy behaviour (spam, bullying, etc)?



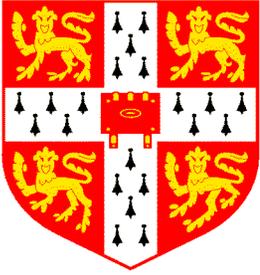
Ongoing studies

- Data?
 - We have large datasets for single edge-type/modality
 - (6M phone call timeloc, 1M social net)
 - But only very small datasets for 2 or 3 modalities
 - 30 army base people -> retirement
 - 100 school leavers -> University
 - Very heavy-lifting
 - Not only lots of data processing, but worse:-
 - Interview each user for context
- Privacy?
 - Correlating (datamining) the different nets is massive breach of trust
- Usefulness?



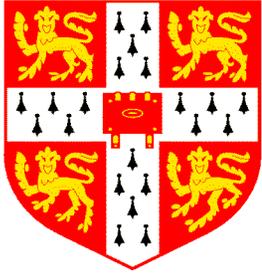
Usefulness?

1. Improve privacy
 1. As mentioned, could auto-default Fb settings and relate to phone/locn
 2. Could also use as interest based filter
2. Fundamental understanding of social groups
 1. How society/technology co-evolve
 2. Social inclusion and accessibility (!)
3. Epidemiology (*)
4. Buzztraq
 1. Use currency of local interest to
 2. Fetch content...



Epidemiology

- Two projects -
 - Emulation (ESRC)
 - Run s/w on smart phone that mimics a disease
 - Has a “vector” and SIR(!) parameter per person
 - Run on “real society” based on meeting duration/proximity/frequency
- Flubook (Horizon)
 - Panic button (“Not well”/”Feelin better”)
 - Uploads list of contacts in last week via free SMS
 - Puts anonymized data on google maps
 - Alerts trusted friendship group on fb



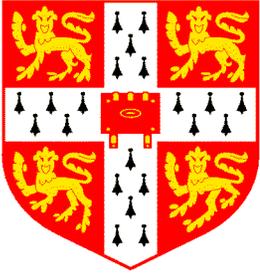
SIR

- Susceptibility, Infectiousness, Recovery
 - Given contact distribution,
 - Can compute progress of epidemic
 - Whether collapse (S, I low, R high)
 - Or go pandemic (S, I high)
 - As with relationship between online and RL behaviour for socialising,
 - Flubook might alter contact rate...
 -systematically for subset of population
 - ...(social or geographic) with high S/I
 - Help prevent/collapse epidemic



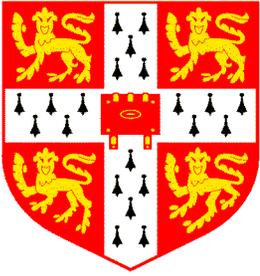
Thank you...

- Questions? ...



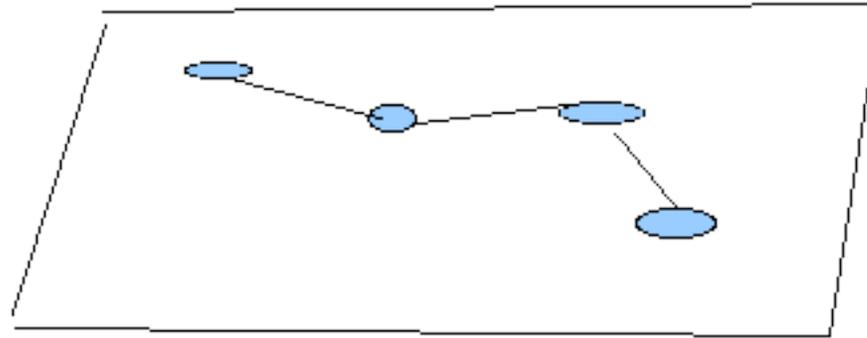
And another thing

- Virtualising online social self
 - Floating it in the “cloud”
 - Crypt content, but allow cloud/fb to match interests (for advertising)
- Migrate it to track user (and handset)
- Performance gain
 - handset can be meagre cpu/memory
 - Latency reduced
 - Synchronisation/persistence assured
 - Don't care if handset lost/stolen :-)

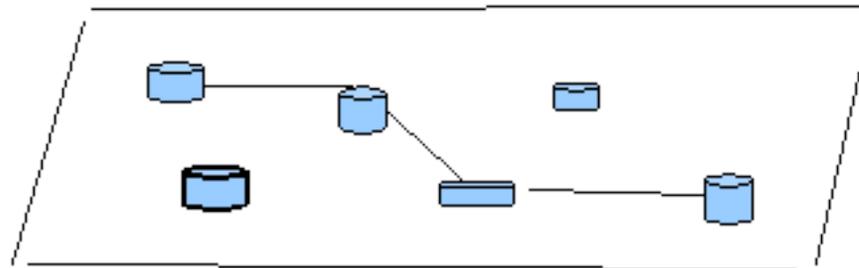


Snakes (and Ladders) on a Plane

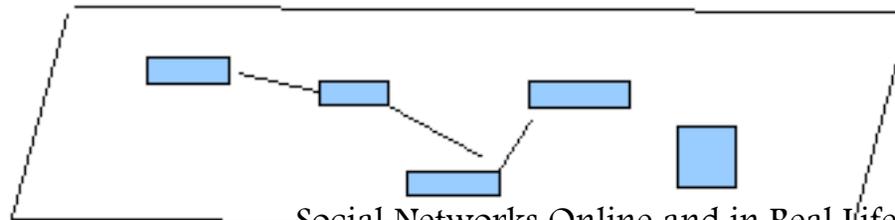
- Human

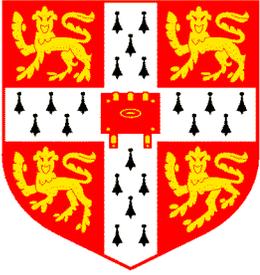


- Node



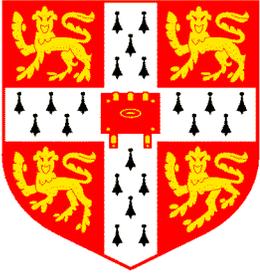
- World





Threads of your life

- Human level is activities & relationships
- Nodal level is processing and storage
- World level is location and context



Idea is...

- To allow mobile (compact/portable) representation of your activities and relationships (Owned by you)
- Roam across arbitrary nodes in environment (embedded or handset owned by anyone)
- While recording where you are and context (= other people)