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Update / chat about CAIA and the Telecommunications Acadmic Group

17 May 2012

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Talk outline

- Overview
- 10 years of CAIA
- Research themes – looking to the future
- Public presence
- GPL and BSD licensed code – relevance & impact
- Resources – rooms, labs, networks, computers
- Responsibilities & Policies
- Academic group budget & business goals

Overview – Informal, reflections, Q&A



- Recap of CAIA's past 10 years
- Throwing out some ideas for consideration
- Update on things happening around us
- Opportunity for questions (now, or later)

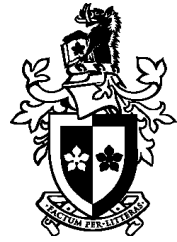
(This talk follows from, and partially overlaps with, my talk in August 2011, at <http://caia.swin.edu.au//talks/CAIA-TALK-110818B.pdf>)



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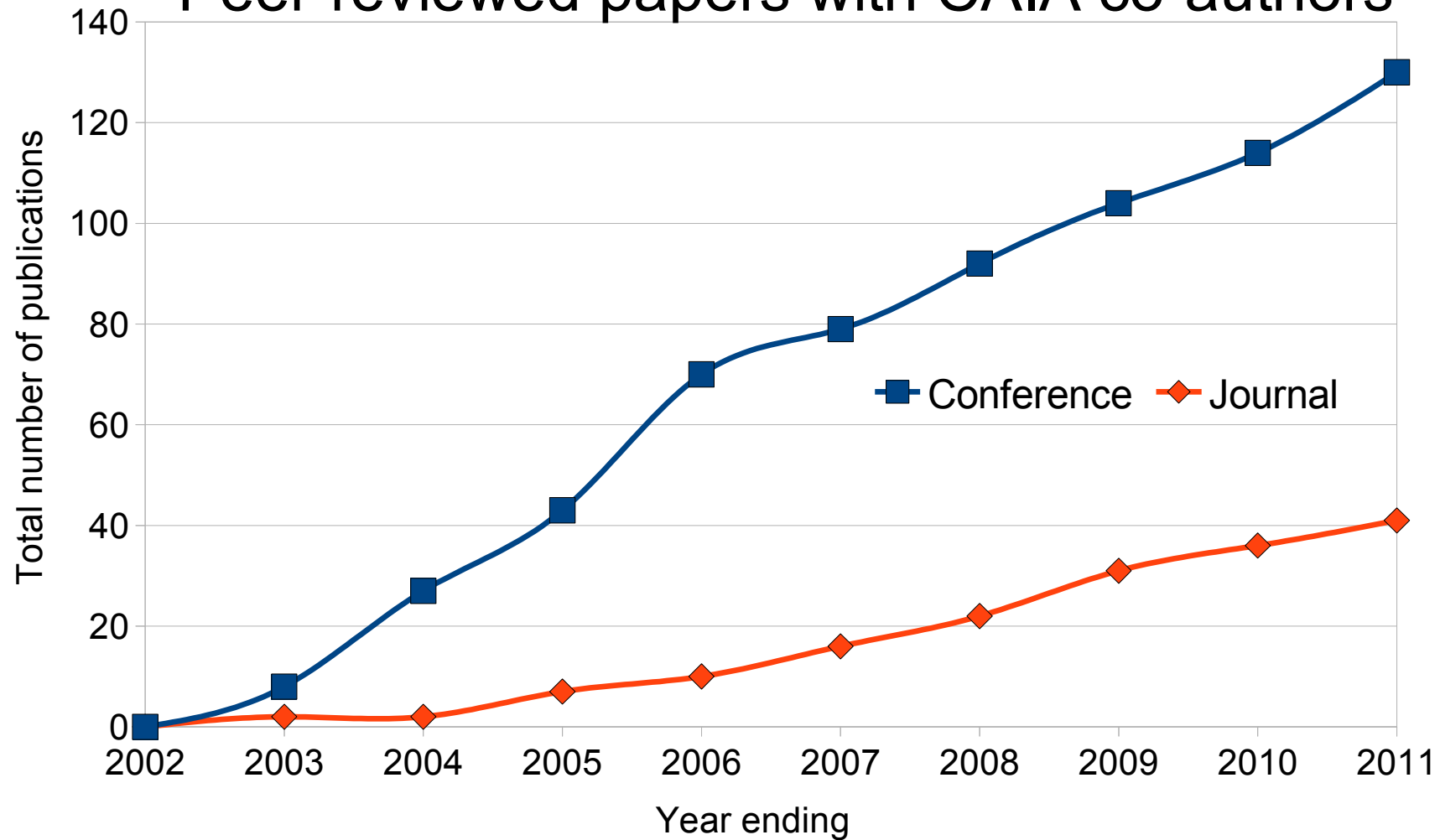
CAIA: March 2002 → Present day



Reflections from the website....



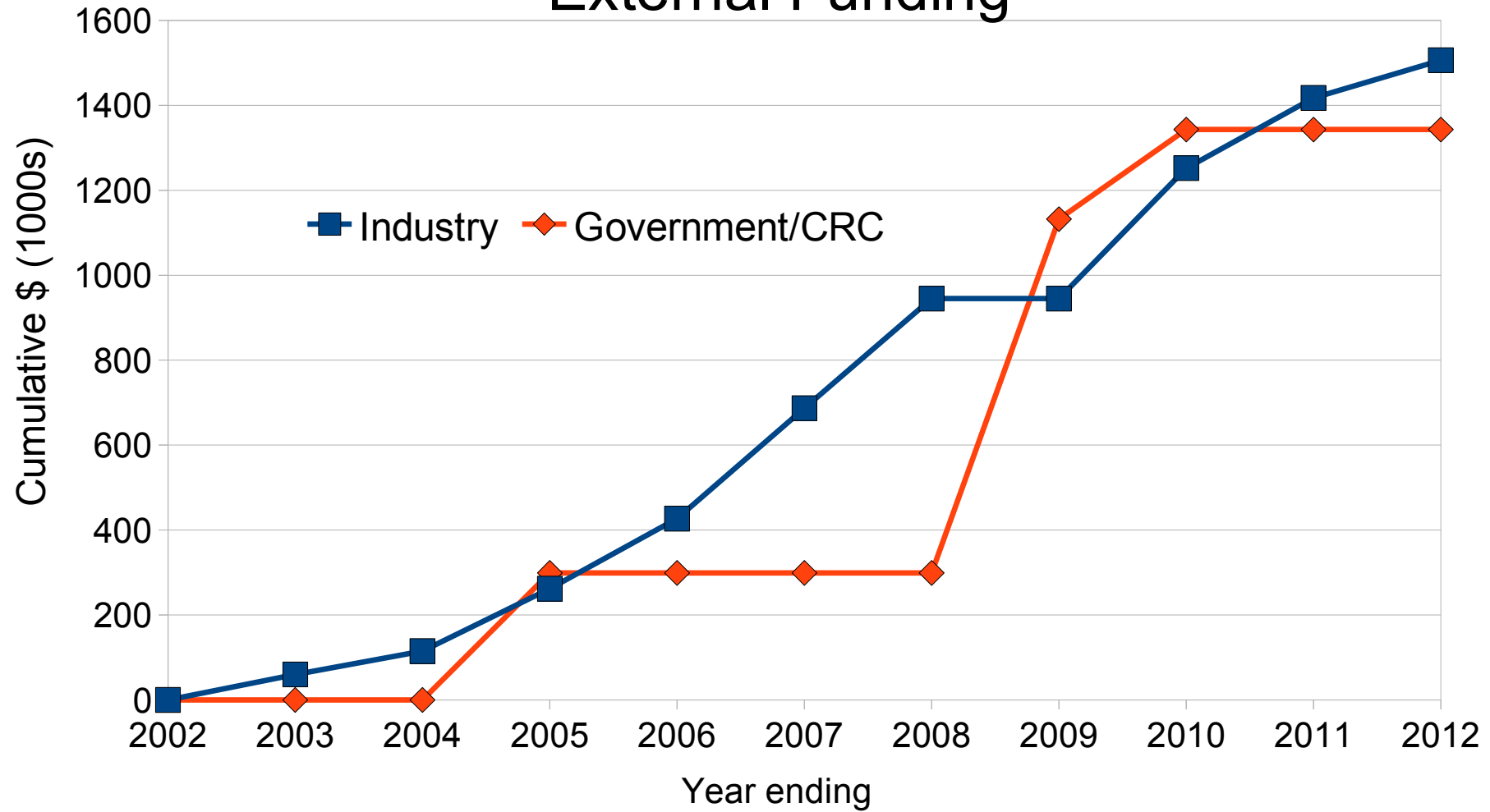
Peer-reviewed papers with CAIA co-authors

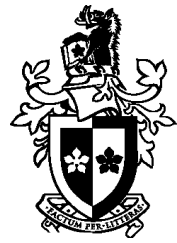


(Approximate figures)

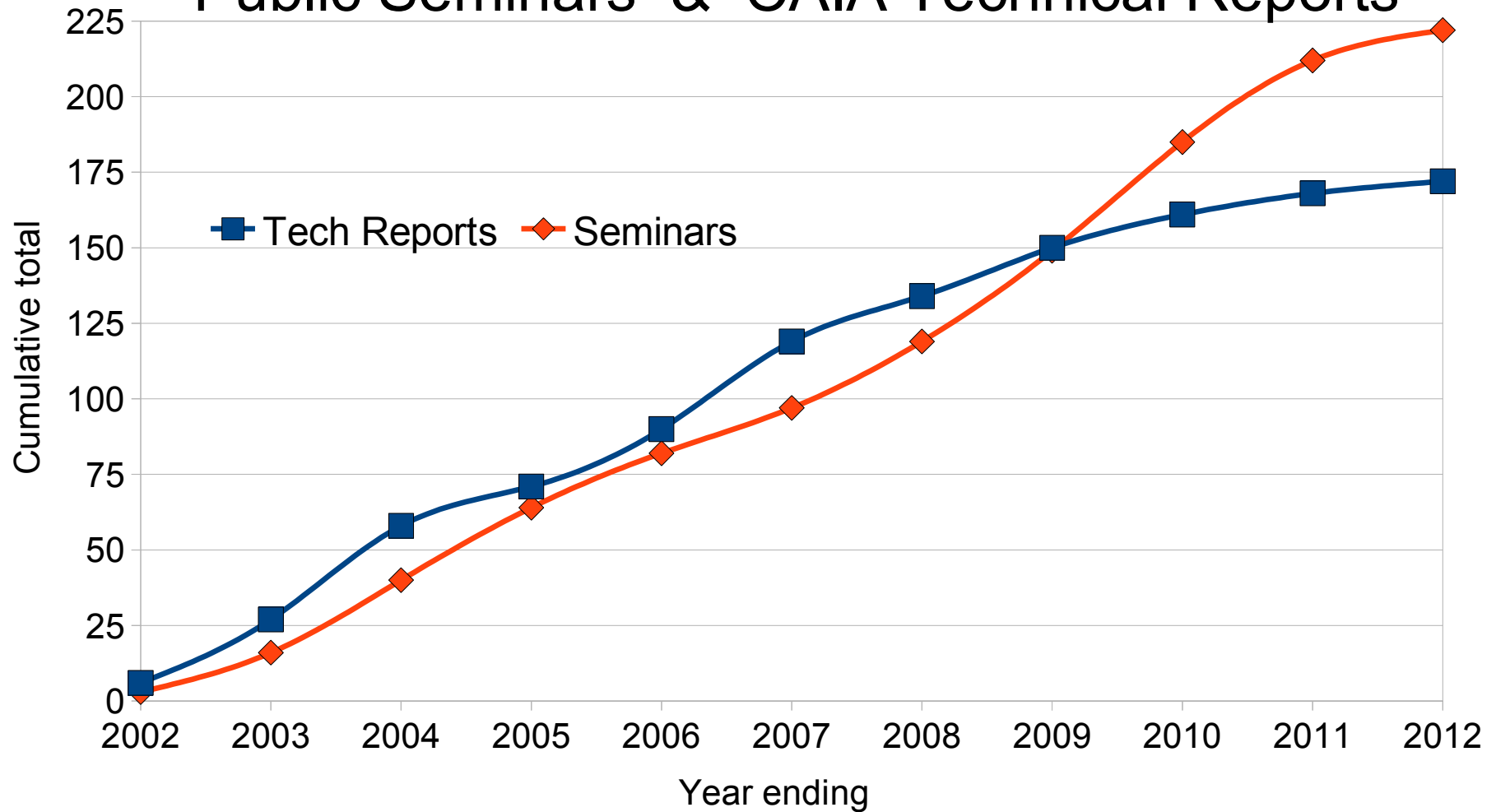


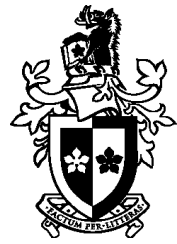
External Funding





Public Seminars & CAIA Technical Reports





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Research themes

(just kick-starting discussion here...)

- We exist in a broader R&D context/community
- Often a need to describe our research concisely
 - Help external understanding of our work
 - Influences funding and collaboration opportunities
 - Help guide internal allocation of resources & time
 - Influences personnel choices, tasks, individual tasks, ...
- Challenge – describe the technology or application?



Tech-focused research themes

- CAIA has had defined tech programs/projects
 - GENIUS (<http://caia.swin.edu.au/genius>)
 - game traffic analysis & modeling
 - GREEN (<http://caia.swin.edu.au/green>)
 - Energy efficient networking
 - MAGIC (<http://caia.swin.edu.au/magic>)
 - Mobile networking (including WiFi and intelligent transportation)
 - NGEN (<http://caia.swin.edu.au/ngen>)
 - Collection of transport protocol projects (inc. “newtcp”)
 - ICE³ (<http://caia.swin.edu.au/ice>)
 - Societal impact of heavily meshed FTTx networks (like NBN)
- And also: various Routing and real-time traffic classification projects (DIFFUSE), LIFE (IP-based lawful interception), etc...



Application-oriented research themes

- “What is the research for?” / “How does it fit in the broader world?”
- Perhaps three “application themes” ?
 - Seamlessly Integrated Broadband Services
 - ICE³, NGEN, DIFFUSE, LIFE....
 - Intelligent Transport Systems
 - MAGIC / wifi / etc
 - Energy Efficient Society (through/because of telecomms)
 - GREEN / transport vs telecommuting, etc

Stay tuned, have a think, make suggestions...



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Our public & online presence

- Communicating ourselves to the outside world
 - Our online presence is instantly international
 - “I'm linked, therefore I am”
 - And if no-one knows, did your work ever happen?
- Multiple tech-savvy audiences
 - Present & potential collaborators and funding sources
 - Future students (postgraduates, undergrads, interns...)
 - Other researchers looking for relevant work to cite
 - Ourselves (colleagues, bosses....)

Be credible and informative



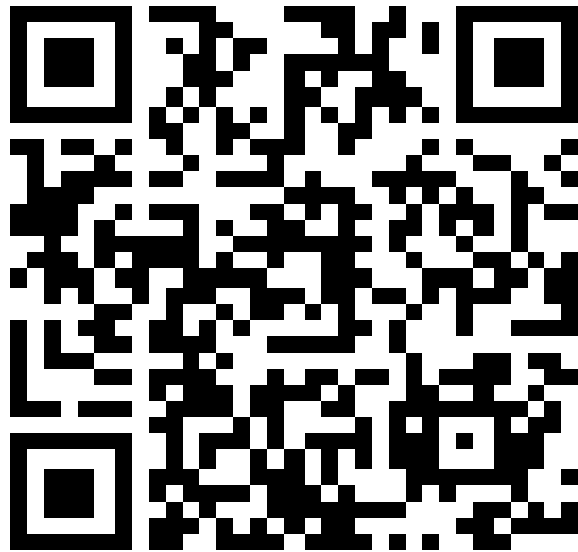
We are found by multiple pathways

- Telecomms Academic group
 - Welcome mat (<http://www.swinburne.edu.au/ict/areas/telecomm.html>)
 - BEng(TNE) (<http://www.swinburne.edu.au/ict/courses/undergrad/bachelor-telecommunication-network-engineering.html>)
 - BICT(NDS) (<http://www.swinburne.edu.au/ict/courses/undergrad/bachelor-network-design-security.html>)
 - External Advisory Group (<http://www.swinburne.edu.au/ict/areas/telecomm-external-advisers.html>)
- CAIA
 - Welcome mat (<http://caia.swin.edu.au>)
 - Project web pages (<http://caia.swin.edu.au/programs>)
 - Publications & Tech Reports (<http://caia.swin.edu.au/pubs> & <http://caia.swin.edu.au/reports>)
 - Individual CV web pages (<http://caia.swin.edu.au/cv>)
 - and pages for our Seminars, News, Tools, Prospective students, Funding Sources, Consulting



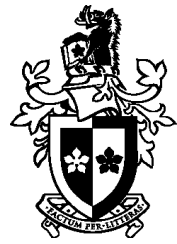
Click-through from meat-space

- An experiment... adding “QR codes” to the CAIA/Telecomms noticeboard, e.g.



→ <http://caia.swin.edu.au/reports/120412A/CAIA-TR-120412A.pdf?qr=350>

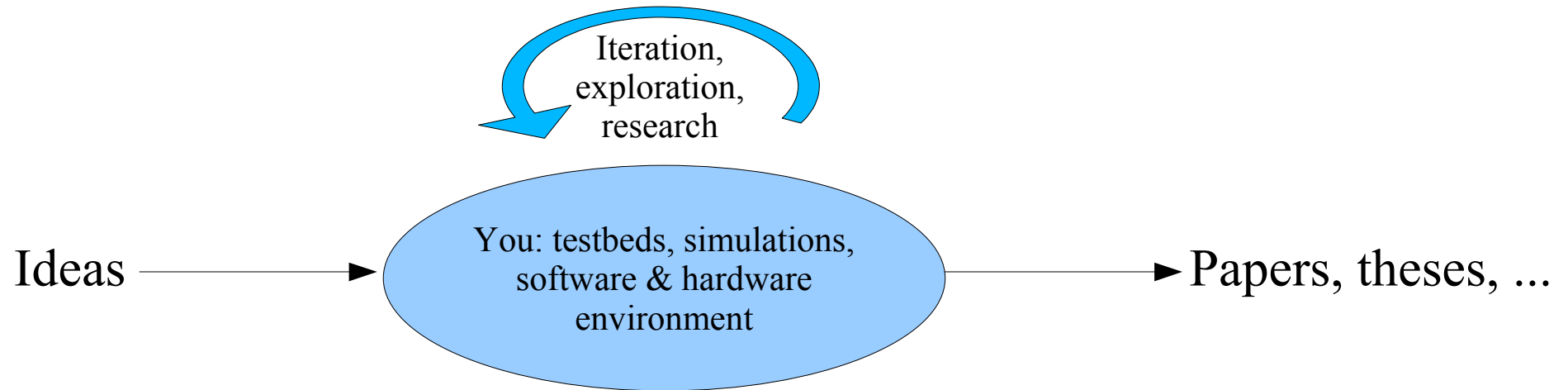
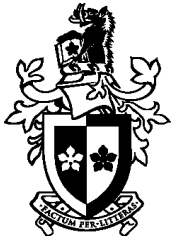
- Lowers the “barrier to curiosity” → Bystanders can more easily 'click through' to our online content
- Encode URLs that leave a trail of evidence in the CAIA webserver log → We'll review the impact later in 2012



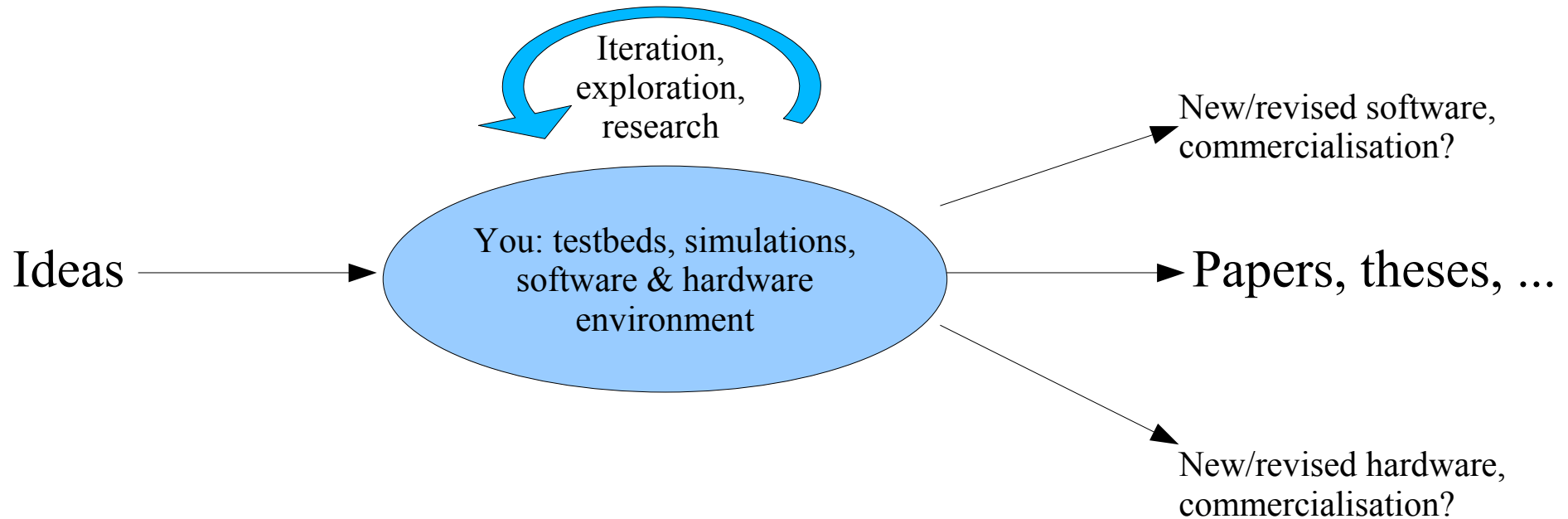
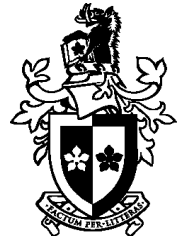
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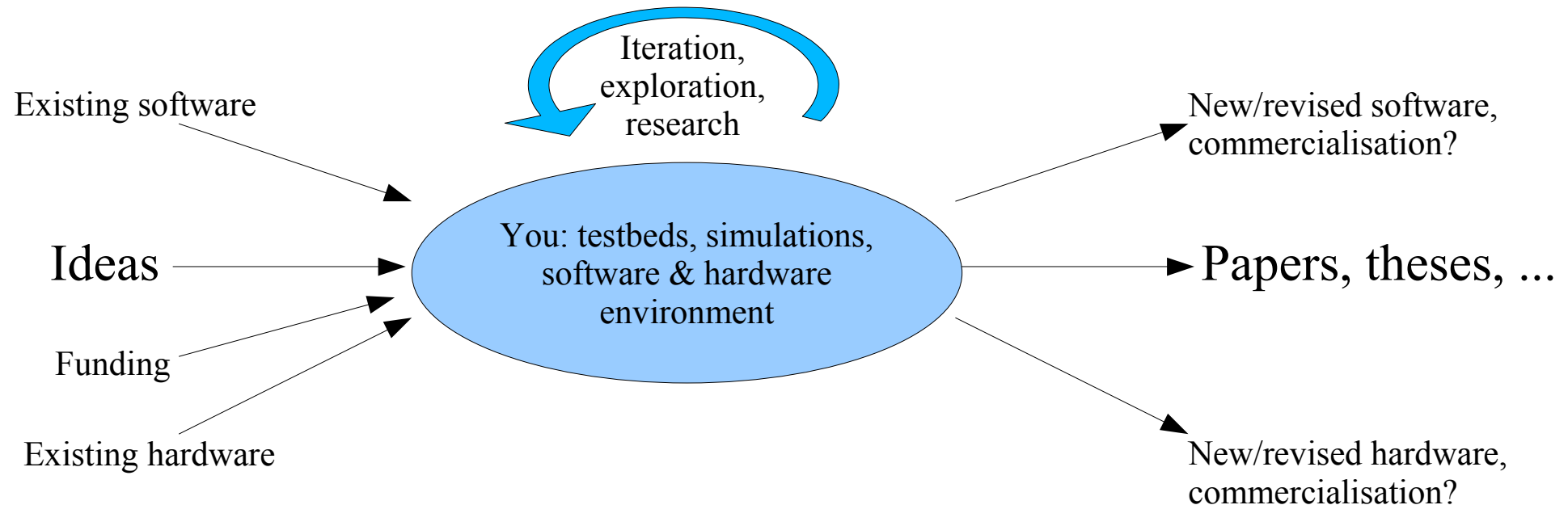
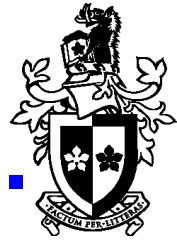
Simplified model of research process



You might envisage greater impact

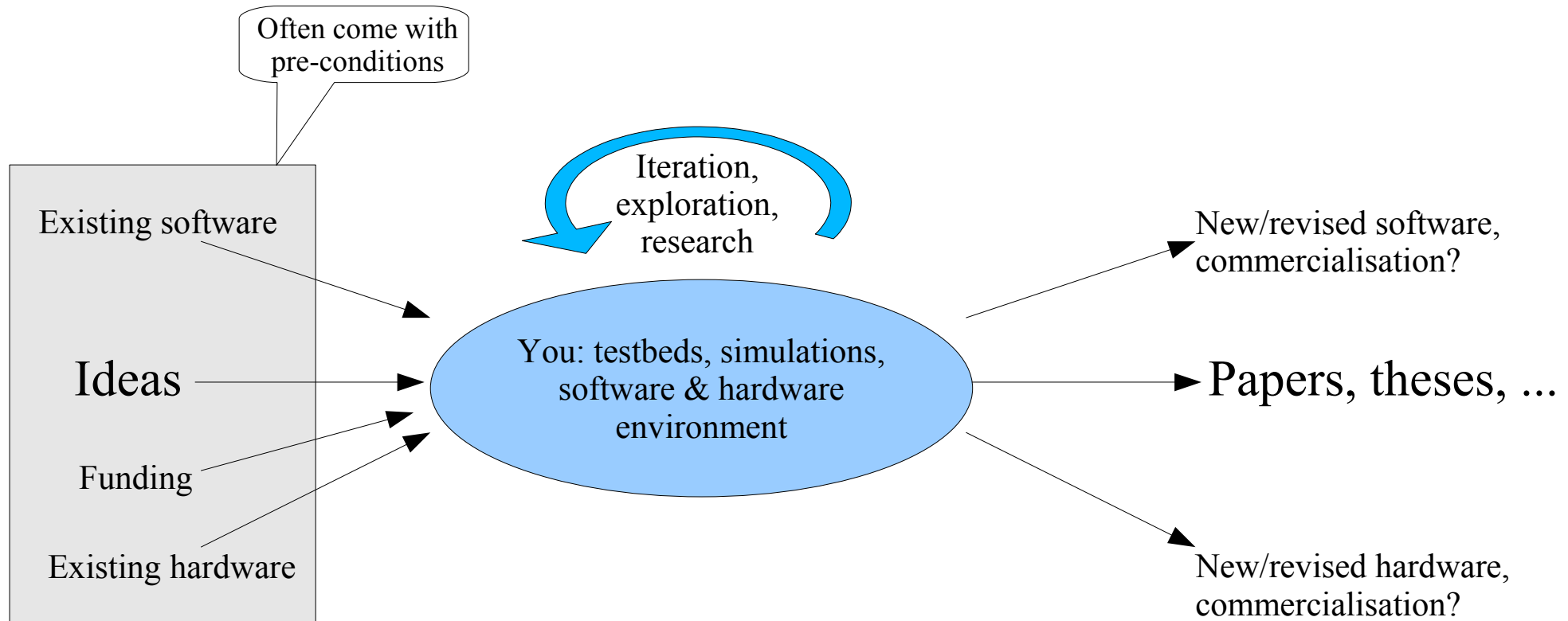


Of course, more than just *your* ideas...



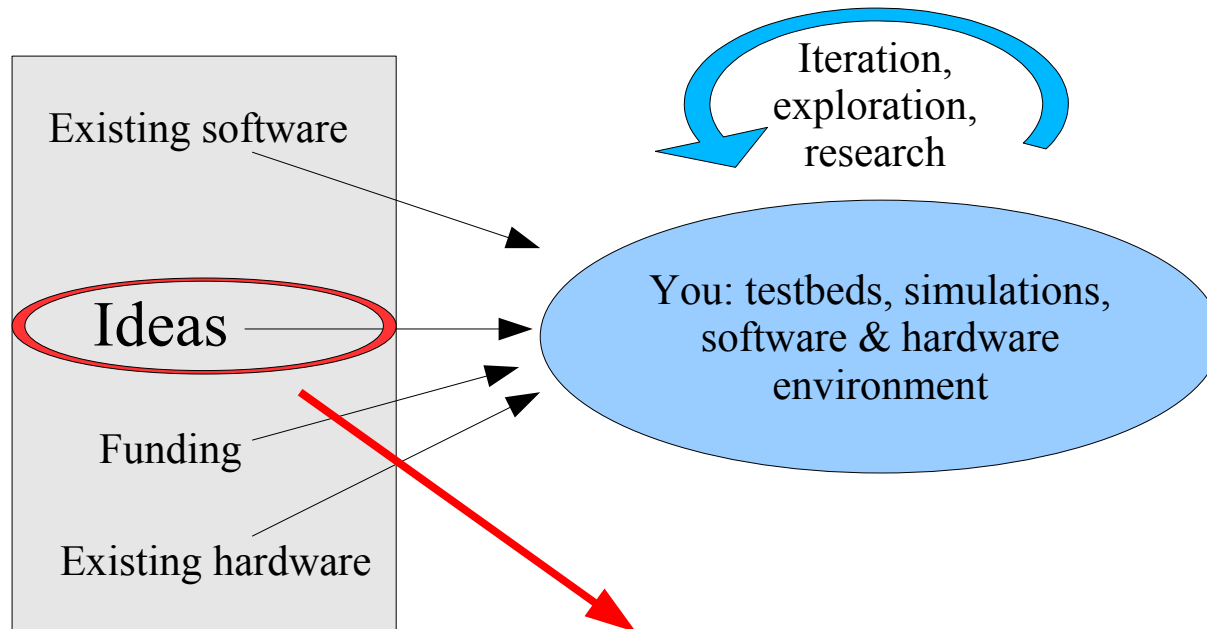


Consider the *strings attached*...





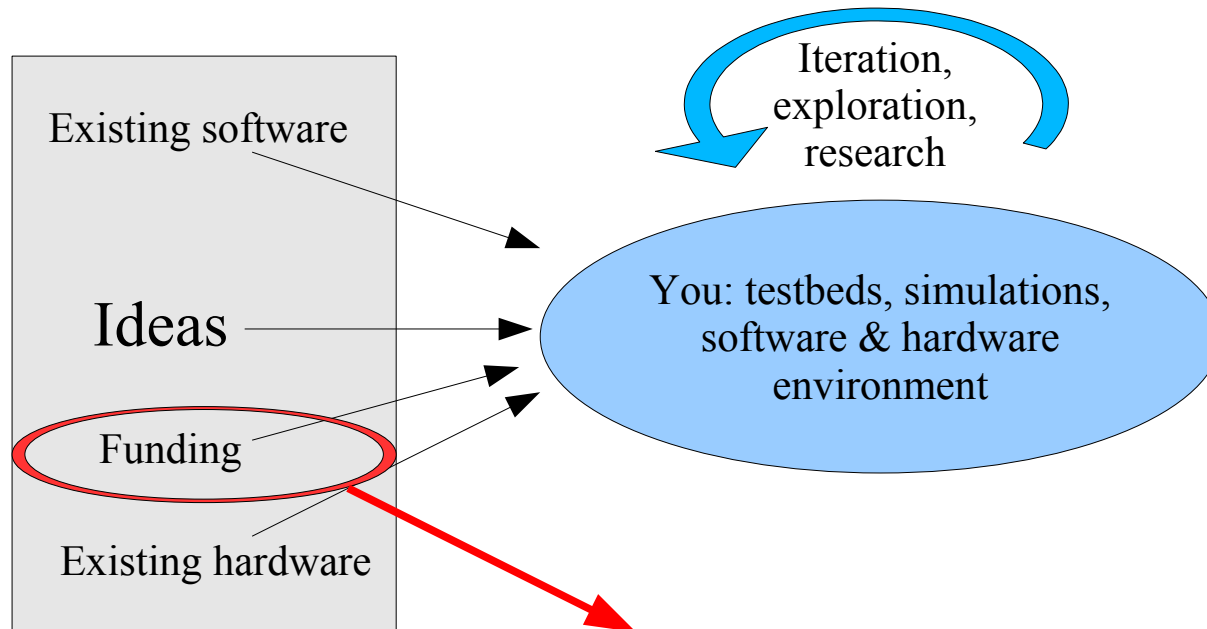
Previous ideas....



- Publicly available work: Cite & acknowledge when utilising the work of other people
- Unpublished (including knowledge obtained under NDA, etc): Almost certainly you cannot utilise



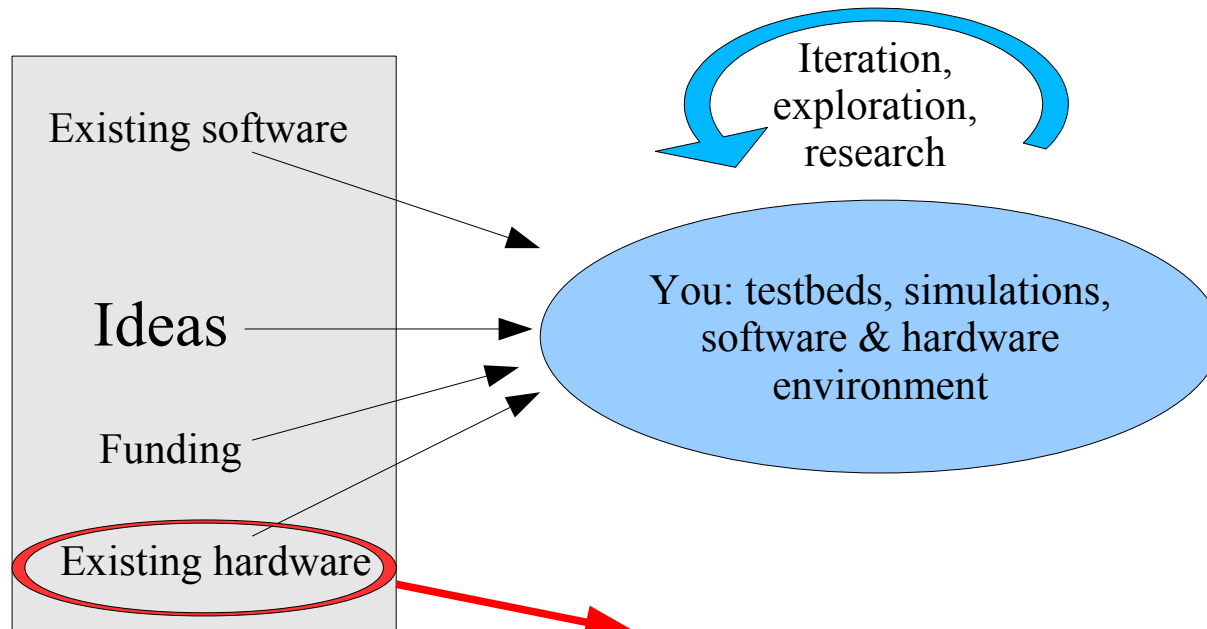
Consider the *strings attached*...



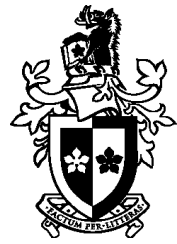
- Funding body (scholarships, equipment grants, salaries, travel support) may have requirements ranging from simple acknowledgement all the way up to non-disclosure and full ownership of any intellectual property you create



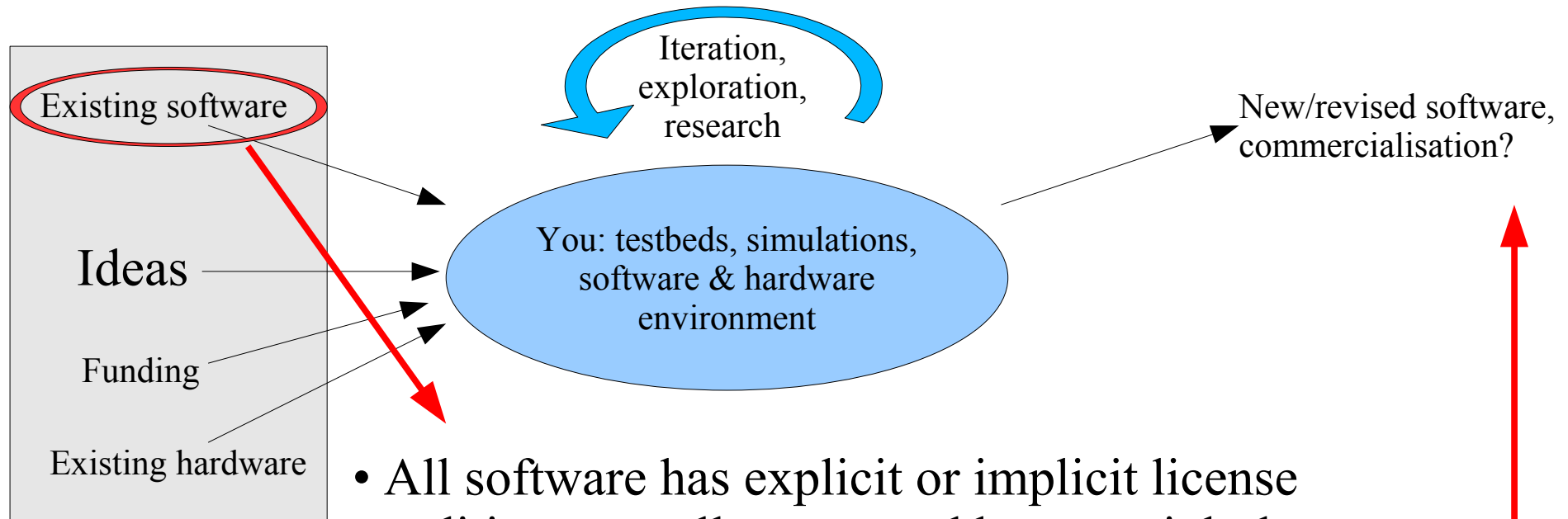
Consider the *strings attached*...



- We typically use hardware 'as-is', but...
- Hardware/firmware/ASIC designs are often covered by copyright – be careful before releasing a 'new' version of someone else's hardware design



Consider the *strings attached*...



- All software has explicit or implicit license conditions, usually protected by copyright law
- Empirical / experimental work often modifies existing code → “time to market” (time to publish)
- Be aware of obligations that might carry through to your modified code (not all 'open source' is the same)



GPL, BSD,

- Software licenses on ingress taint the egress
- BSD-style licenses are similar to academic citation
 - Simplistically: *“acknowledge your use of my code, but you don't need to reveal what you've added or changed”*
- GPL benefits the broader eco-system
 - Simplistically: *“benefit from my code but contribute your improvements to the broader community”*
- “Freedom”?
 - GPL protects freedom of the code itself, BSD provides freedom to the end-user – both have roles to play
 - Chose a license that matches business goals you might have for your research (commercialise? publicity?...)



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Rooms – Colleagues & collaboration

- Deliberate co-location of group academic staff and CAIA researchers around EN60{1,2,5,6} area
- Co-location has benefits
 - Staff, postgraduates, interns in the same region
 - Easy of collaboration – sharing & stimulating new ideas
- The EN605 common space is a challenge
 - Keeping noise levels reasonable
 - phone calls, discussing experiments, test-beds....
 - Keeping the shared space(s) secure



CAIA project and office space...

- EN605 (main lab) → postgrad students & interns
 - EN605a → Cisco URP / gja / ?? projects
 - EN605{b,c} → Hai/MAGIC, newtcp/NGEN, Diffuse, etc...
 - EN605d → GREEN / ARC Fellowship (Lachlan)
- New space, delayed
 - EN606c → 3x “postdoc” (i.e. CAIA research staff)
 - EN602c → 2x Sessional + 2x CAIA R&D staff
- EN601a → Telecomms/CAIA visitor office
- EN613 → project servers/hosts (dedicated air conditioning)



Local computing resources

- <http://mordor.caia.swin.edu.au>
 - DHCP server for 136.186.229/24 (.240 – .253 range)
 - Dynamic IP addresses are for *temporary* use only
 - Primary research staff file server (with hourly backups)
 - All CAIA members (should) have & use accounts here
 - Access via ssh login or Windows/SAMBA file shares
 - Your CV web page → `/home/<username>/public_html/cv`
- Accessing mordor account backups:
 - `mordor:/backups_bydate/mordor/home/<username>` (most recent backup)
 - `mordor:/backups_bydate/mordor/.zfs/snapshot/<date_time>/home/<username>`
 - where "<date_time>" is in the form YYMMDD_HHMM (e.g. the 8pm snapshot of March 8th 2011 would be 110308_2000)



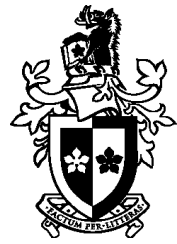
Local computing resources #2

- <http://archive.caia.swin.edu.au>
 - Repository of ISOs, CAIA talk/seminar templates, etc
- Our primary backup servers
 - raidserv1.caia.swin.edu.au & raidserv2.caia.swin.edu.au
 - Each machine: FreeBSD 8, Intel i7 950 Processor, 24G RAM, ZFS “RAID-Z2” array of eight x 2TB drives
 - rsync hourly or daily rsync from other key machines
 - archives of older research project datasets
 - FreeBSD “jails” and VirtualBox VMs for other in-house services



Other in-house servers/services

- caia.swin.edu.au (Main public web server)
 - Managed by gja & various others
- printserver.caia.swin.edu.au (CUPS print server)
- pxeboot.caia.swin.edu.au (pxeboot services)
 - Managed by Jason
- svn.caia.swin.edu.au (subversion repository)
- proxy.caia.swin.edu.au (caching http proxy)
- ldap.caia.swin.edu.au (LDAP server)
 - Managed by Lawrence



Project-related servers/services

- `pinger.caia.swin.edu.au` (active network scanning)
 - Managed by Sebastian
- `gs.caia.swin.edu.au` (public game server)
 - Managed by `gja/cholman`
- `l3dgeworld.caia.swin.edu.au` (LCMON server)
 - Managed by `gja`



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Policies: OH&S, Travel,

- We live within a corporate structure
 - Some policies are imposed from outside, some by me
 - <http://www.swinburne.edu.au/corporate/registrar/ppd/>
 - Keep an eye on emails from me, Moyra, Roberta
- CAIA travel & security policy on FAQ page
 - TL;DR
 - Have a good business rationale for travel (presenting paper at a top conference is a good rationale)
 - Don't let strangers into the lab (everyone is a stranger unless they have a key or a known CAIA member is their host)

And then there's network / computer security...



Our good relationship with ITS

- We have relaxed network rules
 - 136.186.229/24 (CAIA) & 136.186.228/24 (Telecomms acad) can initiate TCP and UDP sessions to anywhere
- We can customise our desktop OSes
 - Dual- or multi-boot Windows, FreeBSD, Linux,
 - Manage it ourselves (<http://archive.caia.swin.edu.au>)
- We can use non-corporate email and web clients
 - Thunderbird, etc...
 - Self-manage, use IMAP / SMTP to outlook.swin.edu.au once the email system migration kicks in (tonight?)



Good relationship with ITS #2

- We are not entitled to these freedoms
 - University auditors pressure ITS to lock-down all networked devices
 -most university subnets and networked' devices
- ITS will revoke CAIA flexibility if we abuse it
 - ITS trusts me to keep CAIA clean, I trust you to do same
 - Do not repeatedly create problems for ITS or disrupt our local network
 - Mistakes are learning opportunities, but please try not to learn too much at everyone else's expense ;)



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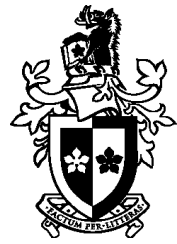
Internal funding & support

- University/Faculty directly provides
 - Acad staff salaries, post-grad student schols & travel*
 - \$1K/staff for PDR “Development”
- I receive a small budget for Telecomms & CAIA
 - 2012: \$--K (cf. \$--K in 2011, \$--K (CAIA)+\$--K (Telecomms) in 2010.)
 - Academic Staff travel (conferences, professional development)
 - Industry engagement (travel & food costs), Internships
 - Team morale & outreach (social engagements, Telecoms/CAIA parties, posters, industry breakfasts, etc...)
 - Specialised equipment to enhance productivity or try new ideas (e.g. KVMs, ethernet switches, secondary PCs, ...)



External funding

- Research-active academic staff are expected to attract research funding from external bodies
 - Long-term growth & flexibility requires external funds
 - (This is not an obligation for PhD students. In general, also not an obligation for staff on short- or fixed-term contracts)
- ARC Discovery and Linkage grants
 - Often long-term (3+ year) projects + large academic prestige
- Industry grants
 - Often short-term (1 year or less) + engagement prestige / links
- Consulting / short-term contracts
 - Talk to me first before making commitments of your time, CAIA space and resources....



Recruitment of students to CAIA

- Space is (soon to be) no longer the bottleneck
 - 15 desks in EN605 (3 “low profile”, 12 regular)
 - + possible intern desks in EN605{a,b,c,d}
 - 5 “staff” desks in EN60{2,6}c, visitor in EN601a
- I would like to see in 2013/2014
 - Academic staff members with multiple PhD students
 - e.g. 3 each for Jason and Philip, 4 each for Hai, Lachlan and myself (without sacrificing quality)
 - Two or three interns winter & summer
 - Visitor & four R&D / postdoc staff



Recruitment of coursework students

- Our BEng(TNE), BICT(NDS) and Masters programs need students (I'll ask Dragi to provide more detailed overview in a later talk...)
- Marketing to the outside world
 - School visits, OpenDay, videos of key infrastructure like the ATC Networking Labs, printed material, etc...
 - Feed student 'success stories' to me / FICT Marketing
- “Research-teaching nexus”
 - Expertise in leading telecomms tech contributing to content and direction of taught units
 - Experience in teaching → research papers on technology education & educational technology



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Question, rumours, gossip?