
BIC/DIMACS/A4Cloud/CSA International Workshop on Trustworthiness, Accountability & Forensics in the Cloud (TAFC2013) Malaga, Spain, Friday 7\textsuperscript{th} June 2013

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Workshop Focus

- Cloud computing as a “game changer”
  - e.g. EU economy
- Challenges:
  - standards, certification, data protection, interoperability, lock-in, legal certainty
- How to enhance trustworthiness in the cloud...
  - Technical & policy mechanisms to enable them
- Discuss how public, private & research communities can increase confidence in use of cloud computing
  - Ongoing research work; future research challenges – H2020
Policy, Ethics and International Collaboration

- Privacy, ethics and accountability
- Trustworthy host platforms for accelerated research & education
- Strategy for co-ordination of cross domain activities & multi-lateral approach in international cooperation
Continually building up our contact base in South Africa.

In the first years, working groups focussed on technical aspects of network information & cyber security and human oriented approaches for trust, privacy and security and continue to work on these (aligning research topics between the countries).

The point of this to give guidance to Commission where they should have research funding for joint international collaborations in Horizon 2020, the next research programme for 2014 - 2020.

In parallel, now building up a group focussing on a longer term strategy including logistical aspects, including the necessary models, mechanisms and processes required for the enablement of international cooperation.
Focus not only on current field of research but also dedicate some time on what you feel is the necessary future research challenges and work required

- one of the objectives of the workshop is to highlight areas where consortia can be formed in Horizon 2020 and other programmes.
- how international cooperation could benefit this research work in the future, highlighting specific reasons and rationales for it.
University of Cape Town Campus
Today's news

**UCT gets the nod as 3rd most beautiful university**
10 September 2012

Picture perfect: It was UCT's mountain setting that clinched it the 3rd spot on The Telegraph's list of most beautiful universities.

British newspaper The Telegraph chose UCT as the third most beautiful university in the world. Oxford University was first followed by Harvard.

In the photo gallery showcasing the 16 most beautiful universities on the newspaper’s website, the university's "mountain setting" is praise above its architecture.

UCT is the only African university to make it onto the list, which includes one of the oldest universities - in Bologna, Italy - in the world. The university, which is the oldest South African tertiary institution and an African leader in teaching and research, moved to the grounds it currently occupies in 1928, where it celebrated its centenary. The land was donated by Cecil John Rhodes and used to be part of his Groote Schuur estate.

View the [gallery of the 16 most beautiful universities.](#)
Universität Zürich
Kurt Baumecht

Prof. Dr. Dr. h.c. Kurt Baumecht ist einer der Begründer des Informatik in der Schweiz und hat als zentraler Pionier dafür gehalten, dass die Wissenschaftlichkeit der IT in der Schweiz auf eine solide Grundlage gelegt wird. Er hat dabei die Notwendigkeit der Ausbildung von IT-Fachleuten betont und dafür gearbeitet, dass der Fachbereich Informatik an der Universität Zürich anerkannt wurde.

Informatik: An der Praxis orientiert

Die von Kurt Baumecht eingeschlagene Forschungsrichtung richtete sich insbesondere auf die Anwendung der IT in Praxis und Wirtschaft. Er betonte die Notwendigkeit der praktischen Erfahrung und führte in seiner Lehrtätigkeit dort mit seinen Studenten intensive Projekte durch, um die Verbindung zum praktischen Umfeld zu stärken. So war er einer der Begründer der IT-Industrie in der Schweiz und hat maßgeblich dazu beigetragen, dass die Schweizer IT-Branche weltweit anerkannt wurde.

Grüezi@UZH
Information Security as focus area ... IBM ZRL

Identity thieves lurk online

Who you are in cyberspace is worth a lot to criminals, writes Toby Shapshak

DIGITAL LIFE
Tuesday June 1 2002 The Times 21

Identity thieves lurk online

Worth of average user is 803,450, of which 82,000

There's a 92% chance of doing something that is not worth it. The result is that the social engineering is just a handout handed out to everyone.

On the Internet, nobody knows you're a dog.

"I can't explain it—it's just a funny feeling that I'm being Googled."

© The New Yorker Collection 2002 Charles Barnsali from cartoonbank.com. All Rights Reserved.
Threats pile up in war that never ends

How Stuxnet Spreads

Experts who have disassembled the code of the Stuxnet worm say it was designed to target a specific configuration of computers and industrial controllers, likely those of the Natanz nuclear facility in Iran.

INITIAL INFECTION
Stuxnet can enter an organization through an infected removable drive. When plugged into a computer that runs Windows, Stuxnet infects the computer and hides itself.

UPDATE AND SPREAD
If the computer is on the Internet, Stuxnet may try to download a new version of itself. Stuxnet then spreads by infecting other computers, as well as any removable drives plugged into them.

FINAL TARGET
Stuxnet seeks out computers running Step 7, software used to program Siemens controllers. The controllers regulate motors used in centrifuges and other machinery. While the computers in a secure facility may not be on a network, they can be infected with a removable drive. After infecting a controller, Stuxnet hides itself. After several days, it begins speeding and slowing the motors to try to damage or destroy the machinery. It also sends out false signals to make the system think everything is running smoothly.
Cape Town awaits you!

The Waterfront
Our South African reality ..

World's ten fastest-growing economies*
Annual average GDP growth, %

<table>
<thead>
<tr>
<th>Country</th>
<th>2001-2010</th>
<th>2011-2015†</th>
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<tr>
<td>Angola</td>
<td>11.1</td>
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Sources: The Economist; IMF

*Excluding countries with less than 10m population and Iraq and Afghanistan  †2010 estimate  ‡Forecast

South Africa has undergone a political miracle over the last 2 decades

Abolition of Apartheid
- Universal suffrage, free 1 person – 1 vote elections
- International AIDS Conference in Durban
- Truth and Reconciliation Commission
- Nelson Mandela is elected first black president
- International economic sanctions progressively lifted

New constitution elections
- 1994
- 1999
- 2004
- 2009
- 2014
- 2019

Free elections
- 1994
- 1999
- 2004
- 2009
- 2014
- 2019

CODESA
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998

Reincorporation of homelands
- 1994

Rugby World Cup
- 1995
- 2007
- 2011
- 2019

International anti-retroviral rollout plan
- 2000
- 2005
- 2010
- 2015
- 2020

International AIDS Conference in Durban
- 1998
- 2000
- 2002
- 2005
- 2008
- 2011
- 2014
- 2017
- 2020

SA brokers
- Burundi
- South Africa
- China's ICBC

Investment in Standard Bank
- 2003
- 2006
- 2009
- 2012
- 2015

Non-permanent member of UN Security Council
- 2006
- 2009
- 2012
- 2015
- 2018

FIFA World cup
- 2010
- 2014
- 2018
- 2022
Nine key challenges stand in the way of eliminating poverty and reducing inequality

1. Too few South Africans work
2. The quality of school education for most black people is sub-standard
3. Poorly located and inadequate infrastructure limits social inclusion and faster economic growth
4. Spatial challenges continue to marginalise the poor
5. South Africa’s growth path is highly resource-intensive and hence unsustainable
6. The ailing public health system confronts a massive disease burden
7. The performance of the public service is uneven
8. Corruption undermines state legitimacy and service delivery
9. South Africa remains a divided society

Tackling these challenges will require the involvement of all South Africans and coordination and cooperation across society and government
SA lagging behind in doctorates

GERSHWIN CHUENYANE

SOUTH Africans are not opting to study to doctoral level, according to the National Research Foundation.

This has resulted in South Africa lagging behind other emerging economies.

Only 27 in 1 million South Africans have a doctorate compared with 42 in Brazil, 172 in South Korea, 240 in Australia and 259 in the UK.

“We are certainly seeing more people with MBAs, but a lot of people are stopping at that level,” said Georgina Barrick of Renwick Talent, a recruitment agency.

Natalie Fraser of the Association of Personnel Service Organisations, which represents the recruitment industry, blamed the education system for the low number of doctorates.

“Of those leaving university with a degree, many have only just scraped through and would not be invited to continue with honours, much less a master’s or a doctorate,” she said.

“Industries that require researchers and similar theoretical people would probably place higher value on a doctorate-level qualification than a company looking for a managing director or chief executive,” she said.

Professor Mamokgethi Setati of the University of South Africa said: “Fifty percent of growth in the US in the past 40 years was due to research and development. For example Silicon Valley, California, was the result of cutting-edge research that came out of the state universities.”

CITY PRESS 15/6/10
Left UCT full time faculty & joined T-Systems SA in 2002

T-Systems South Africa.
A heritage of growth & success.

Services by DaimlerChrysler

1997

2000

2001

2004

2006

2007

2008

2009

2010
Part of a growing company in South Africa

- T-Systems grew from 500 people in 2000 to 2500 in 2012
- Largest full ICT service outsourcer in South African market
- Supporting key SA enterprises like Eskom, Transnet, SASOL, DWA etc
Our Vision

As the Data Network Architectures group we pursue international research excellence and local industry relevance, while facilitating the professional growth of members of the group.

Core competences

The success of our projects rely on the DNA Group skill set which has its key strengths in:
- Formal Methods
- Software Engineering
- Computer Security

DNA alumni – last 9 years only

- 14 Honours students
- 21 MSc graduates
  - 4 with distinction
  - 6 studied further to attain PhD at
  - University of Zurich (2)
  - Imperial College, London
  - Oxford University
  - Technical University of Berlin
  - Institut National des Telecommunications
- 2 PhD graduates

DNA Alumni in 10 countries of the world
Network Security Framework
2012 Security Visualisation
Security as one of ‘core beliefs’

Based on the major challenges of our customers and society, we have established five Core Beliefs.

**Dynamic Net-Centric Sourcing**
T-Systems delivers flexible ICT sourcing solutions and pricing models for dynamic markets.

**Collaboration**
T-Systems enables companies to work across enterprise boundaries and geographical borders.

**Mobile Enterprise**
T-Systems ensures employees can access their data anytime, anywhere and from any device.

**Security & Governance**
T-Systems provides effective solutions for data security and governance.

**Sustainability & Corporate Responsibility**
T-Systems takes corporate social responsibility seriously.
MAnagement of Security information and events in Service InFrastructures

2010-10-01 to 2013-09-30

www.massif-project.eu

Project funded by the European Commission ICT work programme 2008 (FP7-ICT-2009-5)
Advanced SIEM Framework

Alert and reaction generation

Scenarios
Prototypes
Event and Information Collection
Highly-scalable, dependable and multi-level event collection

Predictive security analysis

Multi-level security event modeling

Trustworthy event collection

Multi-level event correlation

Process and attack simulation

Resilient framework architecture

Languages

EVENTS
POLICIES
RELATIONS
REACTIONS

Event, Process Models and Attack Models

Resilient event processing and integration

Advanced SIEM Framework

Scenarios
Prototypes
Multi-domain parallel-running processes
Olympic Games
Mobile money transfer service
CI Process Control (Dam)
Managed Enterprise Service Infrastructures

Actions and Countermeasures

Security analysis and notification

Security-aware processes

Languages

EVENTS
POLICIES
RELATIONS
REACTIONS

Multi-level event correlation

Process and attack simulation

Resilient framework architecture
Managed Enterprise Service Infrastructures
Think tanks of Deutsche Telekom.

- **T-Gallery**
  - Future forum of Deutsche Telekom
  - Scenarios for future connected life and work from an end-user perspective
  - More than 100 prototypes for connected life and work

- **Deutsche Telekom Laboratories**
  - Dedicated to research and development for Deutsche Telekom
  - International cutting-edge research of new technologies
  - 1 paper/day, 1 patent/week, 1 award/month, 1 Spin-off/year

- **T-City Friedrichshafen**
  - Wirtschaft Zukunft
  - Joint future lab of Deutsche Telekom and the city of Friedrichshafen
  - The world of tomorrow in a real life environment
  - More than 30 future projects

- **T-Systems Innovation Center**
  - Experience innovation
  - Open innovation with customers
  - Rapid prototyping
  - More than 70 customer workshops since 09/2010

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T-Labs „Anomaly Detection and Early Warning System“ (ADEWaS) Project.


T-Labs „Enhanced Database Security & Services (EDSS)“ Project.
Why South African co-operation is desirable?

- Sometimes viewed as a “field trial”!
- Smaller market
- Close(r) to clients
- Open-ness to change
- Like to be early adopters (e.g. pre-paid electricity & mobile, ATMs, Internet banking etc)
- Willingness to take calculated risks (less punitive regime?)
Founding of a South African industry / academic lab ...
Laboratorium fokus op veilige netwerke

JOHANNESBURG — Noor aanmerking was tussen die inligtingsteknologie- en akademie met die stigting van 'n laboratorium wat die insette van beide partiete vereis.

Die inligtingsteknologie- en akademie van 'n laboratorium wat die insette van beide partiete vereis.

Navoronder is ook oor ander sekeriteitsverwante aangeleenthede gedoen.

Oor een uiteindelik, 'n netwerk wat 'n virtualnet kan interpreteer en dienose en framekonfigurasië kan optree sonder dat menslike inmenging nodig is," sê Mr. Mark de Villiers van Cisco SA.

Nauwkeurige werk van inligtingsteknologie is met roepies in die bedryf saamgetrek. Terwyl 'n nauwkeurig deel sal uitmekaar van baie kwaliteit, sal dit relevante en nuttige wees dat aan behoeftes in die praktyk te voldoen.

Die laboratorium sal in navorsing en ontwikkeling, praktiese toets en prototipes en praktiese ontwikkeling doen tot op die vlak waar die koper se kansen deur en dit verder deur die bedryf ontwikkel kan word.

It saal in Johannesburg gelei word en is 'n behulskap in die bedryf.

IT-sektor en akademici vat hande

Network security think-tank

A 2016 vol to follow up to bingo network security was launched in SA. The aim was to conduct research and share knowledge for the benefit of all computer users.

The focus was divided into two parts: The first part is conducted at the University of Johannesburg and Cape Town. The second part is conducted by the Department of Information Technology and Novarex.

The South African lab is designed to be used as an example for the benefit of the industry and country as a whole. The overall goal is to help with the development of new security solutions for the industry and the country.

Academics and industry partners will work closely to develop new solutions and technologies for the benefit of the industry and the country. The overall goal is to help with the development of new security solutions for the benefit of the industry and the country.
How Research Mobility Impacts Careers in North/South Partnerships. The Swiss -- African example.

University of Basel
„Swiss -- African Joint Research Programme“
Kollegienhaus, Wednesday 28th November 2012

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To what extent my studies abroad enabled me to change the world around me, and what recommendations I hold for the young science generation

How was I able to transfer back knowledge as a graduate from a Swiss University to my home country, and what challenges did I encounter

How my research stay in Switzerland influenced my scientific career
SWISS SOUTH AFRICAN JOINT RESEARCH PROGRAMME (SSAJRP)

Welcome
The Swiss South Africa Joint Research Programme (SSAJRP) has been promoting scientific and technological cooperation between Switzerland and South Africa since 2008. The programme is one of several bilateral research cooperation programmes organised by the State Secretariat for Education, Research and Innovation (SERI).

SSAJRP fosters research partnerships between Swiss and South African scientists through joint research projects. It facilitates university faculty and student exchanges to promote knowledge transfer and innovation in both countries. It also supports industry orientated projects with potential for innovation and generation of market-oriented outputs through a number of Academia – Industry initiatives.

About the Programme
Cooperation is based on mutual interest, scientific excellence and reciprocity (matching funds).

In South Africa, SSAJRP is governed by the Department of Science and Technology (DST) and coordinated by the Council of Scientific and Industrial Research (CSIR) more...

Organisation, Background, Goals, Budget, Media
01.05.2012 News about SSAJRP from the SER website >

Funding Instruments
SSAJRP aims to strengthen existing research partnerships, aid the formation of new scientific networks and support knowledge transfer and innovation in Switzerland and South Africa. The programme’s funding instruments have been implemented to support both established researchers and young early career scientists.

Details >Funding Instruments

SNSF website >
Joint Research Projects, Faculty & Student Exchanges, Academia - Industry Initiatives, further funding programmes

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State Secretariat for Education, Research and Innovation SERI
www.sbf.admin.ch

Other Programmes
Similar bilateral research cooperation programmes exist with:

India
China
Russia
SWISS SOUTH AFRICAN JOINT RESEARCH PROGRAMME (SSAJRP)

About the Programme
Cooperation is based on mutual interest, scientific excellence and reciprocity (matching funds).

In South Africa, SSAJRP is governed by the Department of Science and Technology (DST) and coordinated by the Council of Scientific and Industrial Research (CSIR).

On the Swiss side, SSAJRP is administered by SERI. The University of Basel, as the Swiss Leading House for South Africa, and the Swiss Tropical and Public Health Institute, as the Associated Leading House, jointly assume coordination and management responsibilities.

In the 2013-2016 phase of the programme, SSAJRP will cover the following four priority research fields:

- Public Health & Biomedicine
- Bio- & Nanotechnologies
- Energy (emphasis on renewable energy sources, reliable energy supply and clean technology)
- Human & Social Sciences

Organisation
SSAJRP operates through a structure of standing committees, composed of representatives from government, universities and the private sector.

The Swiss South African Joint Committee, the supreme body and highest authority of SSAJRP, defines the strategic goals and orientation of SSAJRP. The committee is composed of an equal number of representatives of Switzerland and South Africa and chaired jointly by a representative of each side.

Background
The University of Basel has developed close ties with Southern Africa over several centuries. Since the founding of the Basler Mission (today mission21) in 1815, Basel has been building competence in research on South Africa. Vital for the establishment of scientific relations has been the Swiss Tropical and Public Health Institute, whose research on malaria prevention in Tanzania was awarded the Prince of Asturias Price.

The reputed Basel University Centre for...
SWISS SOUTH AFRICAN JOINT RESEARCH PROGRAMME (SSAJRP)

Funding Instruments
SSAJRP aims to strengthen existing research partnerships, aid the formation of new scientific networks and support knowledge transfer and innovation in Switzerland and South Africa. The programme’s funding instruments have been implemented to support both established researchers and young early career scientists.

Joint Research Projects
SSAJRP’s four priority research fields for the 2013 - 2016 phase of the programme are:
- Public Health & Biomedicine
- Bio- & Nanotechnologies
- Energy (emphasis on renewable energy sources, reliable energy supply and clean technology)
- Human & Social Sciences

Further details >
SSAJRP 2013-2016, SSAJRP 2008-2011

Faculty & Student Exchanges
SSAJRP supports young and established scientists through faculty & student exchanges. Faculty and student exchange grants promote knowledge transfer between Switzerland and South Africa by facilitating the establishment of cross-country cooperation partnerships and networks. In addition, the grants enhance the personal development and future career prospects of students and early-stage scientists.

Details >

Academia - Industry Initiatives
Initiatives in this science-to-market phase contribute to strengthening links and cooperation between academia and the biotechnology industries of South Africa and Switzerland.

Further details >
Seed money call 2011

Further Funding Programmes
COST - In July 2009 South Africa joined the COST network. COST (European Cooperation in Science and Technology) is one of the longest-running European instruments supporting cooperation among scientists and researchers across Europe and beyond. Networking activities between Europe and South Africa are financed through the recently signed reciprocal agreement. For detailed...
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<td><strong>Further details &gt;</strong></td>
<td><strong>ESKAS</strong> - Up to 10 university scholarships are granted to postgraduate students under the ESKAS programme.</td>
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<td><strong>Seed money call 2011</strong></td>
<td><strong>SNSF</strong> - The Swiss National Science Foundation (SNSF) offers additional funding possibilities for researchers working in Switzerland such as <em>International Short Visits</em> and <em>International Exploratory Workshops</em>.</td>
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<td><strong>GLOBAL SOUTH SCHOLAR-IN-RESIDENCE PROGRAMME</strong> - The Graduate Institute of International and Development Studies has created a <em>Global South Scholar-In-Residence Programme</em> specifically tailored to academics from universities of Africa, Asia and Latin America to permit them to further develop their teaching and research capacities.</td>
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CHF600,000 in 2011
for 9 joint projects
Observations

- Strong leader / “champion” in Uni Basel
- Multi-disciplinary focus dilutes
- Modes of funding are typical (joint projects, exchange, student support, etc)
- Forums
- Lack of industry involvement (e.g. IBM ZRL, Google Zurich, Pharmaceutical companies etc)
- “Best kept secret”
BIC development of programme in South Africa

- BIC is advocating a more multi-lateral cooperation model ... needed especially for cyber security

- Has a slightly extended model of working groups, including one called an Extended Working Group (EWG) in country

- Recently launched an EWG in India (Mr. Abhishekar Sharma of the BIC International Advisory Group (IAG) presenting India progress and launch ... aim to duplicate in South Africa and Brazil.

- Goal: to set up an EWG in South Africa in the next months.
Constituencies

- **Industry**
  - International companies
  - R&D entities
  - “Local” companies
  - Startups?
  - BEE

- **Academic**
  - Universities
    - Funding: national, international, industry (local / international)
Cyber Security

- Develop expertise in South Africa
- Increase number of qualified graduates (especially post-graduate)
- Critical infrastructure requires special consideration and protection
- Sophistication (and globalisation) of attacks continues to grow at rapid pace
- Joint European / South African projects can improve situation at many levels
Thank you!