



Computer Science

# Department of Computer Science



UNIVERSITY OF CAPE TOWN

# Department Overview

The Department of Computer Science aims to be the premier computer science department within Africa and make contributions to the discipline at a global level. To that end, we are constantly evolving our undergraduate, postgraduate and research capabilities, to produce and attract good students and staff to UCT. To this end some of the most recent initiatives are :

- Created the UCT Centre in ICT for Development – August 2008. Our department has built a reputation globally as one of the top places to study the application of ICT to issues of development. The centre allows us to bring this work into one unit and create a unified interface with our international partners.
- Had our degree accredited by the British Computer Society (BCS) – April 2008. The visit by the BCS accreditation committee in April 2008 produced a report accrediting the UCT B.Sc Computer Science degree for a five year period.
- Hosting the Hasso Plattner Research School – 2009. Hosted within the ICT4D centre will be the HPI Research School, the first such international institute. It will support African PhD students studying in the field of ICT4D.
- Computer Games stream – 2008. The Computer games industry is one of the largest digital industry worldwide, however there were no courses in South Africa designed to train game developers. This stream, in conjunction with Film and New Media, will cooperate with the Provincial Film and Media initiatives to increase the digital media base on the Western Cape. The first cohort will graduate this year
- Introduced innovative degree programmes (conversion MSc), to meet the skills shortage in IT professionals, and degree specialization (BioInformatics) to explore new disciplines
- Take an active part in organizing and competing in local and global programming competitions (often winning them)
- Work actively with local and international industry (through our advisory board and research activity)

## Context

The Department is located within the Faculty of Science on the Upper Campus of the University of Cape Town. The Department was established in 1971 as an offshoot of the Department of Applied Mathematics. It has access to the shared university and Science Faculty resources for computing and, in addition, runs its own senior and research laboratories.

# Teaching

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The Department offers Science degree programmes at both Undergraduate and Postgraduate level, and contributes significantly to the Computer Science component in the degree programmes of other Faculties, particularly Commerce and Engineering.

## Computer Science Degree Programmes

The Bachelor of Science (Information Technology) is a 3-year undergraduate degree. To cater for the variety of uses of computers in industry and society this degree is offered in a number of specializations. The basic Computer Science courses are core to each specialization and only the ancillary courses which tailor the degree to its area of applicability differ. The streams are:

**Applied Computing:** Designed for students graduating in an additional Science discipline such as Mathematics, Physics, Chemistry, Geology etc.

**BiInformatics:** Designed for students interested in the general field of BiInformatics. This specialization includes courses from Molecular and Cellular Biology.

**Business Computing:** Designed for students interested in commercial applications of computers. It includes courses from the Commerce faculty such as Information Systems.

**Computer Engineering:** Designed for students more interested in the hardware aspects of computing and the applicability of embedded systems. It includes courses from Electrical Engineering and Physics.

**Computer Games Design:** Designed for students interested in developing computer games. It is run in conjunction with the School of Film and Interactive media and includes courses in Graphics, Game Programming and Artificial Intelligence.

**Computer Science:** This is designed for students who wish to become specialized Computer Scientists and includes extra Science options such as additional Mathematics.

**Bachelor of Science Computer Science Honours** (B.Sc CS Hons) is a 1-year postgraduate degree, for students who have completed a B.Sc (Information Technology) degree at UCT. It is restricted to students who attain a good pass in their undergraduate degree and allows students to specialize in different areas of Computer Science. The course consists of a number of modules which the students can select according to their future career direction or research directions, followed by a major capstone project. In 2008 the modules offered are: Advanced Computer Systems, Advanced Graphics, Agents, Digital Libraries, Distributed Computing, Effective Virtual Environments, Genetic Algorithms, Interaction Design, Internet Interoperability, Intradomain Traffic Engineering, Image Processing and Computer Vision, Mobile Gaming, Network and Internetwork Security, Parallel Computing, Research Methods, Wireless Sensor Networks, Advanced Database Systems, New Venture Planning, Quantum Computing, Computability and Complexity Theory, Functional Analysis

**Bachelor of Science in Information Technology Honours** (B.Sc IT Hons) is a 1-year postgraduate degree offered to students who have completed a B.Sc Computer Science degree, but not at UCT. This distinction is required for British Computer Society accreditation. The modules and structure of the course is identical to that of the B.Sc Computer Science Honours.

**Masters in Computer Science by dissertation** (MSc/MPhil) only is a 2-year research training degree by thesis only. It is open to students who have obtained a B.Sc Honours degree in Computer Science from a quality university, whether in South Africa or elsewhere. The student undertakes a major research project for the degree. The thesis is examined by three examiners two of whom are external to the University and at least one external to South Africa.

**Masters in Computer Science by coursework and dissertation** (MSc/MPhil) is a 2-year research training degree. It is open to students who have obtained a B.Sc Honours degree in Computer Science but who still need to complete further

advanced study before going on to research under the guidance of a supervisor. The students take courses in their first year of study to give them an adequate background to undertake the research component of the degree, which is undertaken in the second year of study. The thesis component counts for 50% of the degree and again is marked externally.

**Masters in Information Technology** (MSc/MPhil) is a 2-year conversion course aimed at graduates who wish to participate in the current Information Technology revolution but do not possess formal undergraduate IT, CS or IS qualifications. More specifically its intake has been graduates who are working in a post that requires IT skills, or who wish to gain an IT qualification to obtain employment. The degree comprises coursework followed by a research methods module and dissertation which counts 50% of the final grade. The curriculum is especially tailored to give learners an overview of the key disciplines in IT. This course is not only popular with South African students but many students from the African continent take this course, as many African universities are unable to attract the level of staff or afford the facilities available at UCT.

**PhD in Computer Science** is a 3-year research degree where the student undertakes a major research project. The degree must advance knowledge and the student is required to present his finding and research at international conferences or research publications for peer review. This degree is externally examined and is the basis for a career in a research establishment or at a University.

## Contributions to Degrees in Other Faculties

The Computer Science Honours degree can be taken as an option in the Bachelor of Business Science degree offered in the Commerce Faculty. Students take the majority of their courses in the Commerce Faculty and complete the entire fourth year Computer Science Honours courses.

Students taking the Computer Engineering option in the Electrical Engineering Departmental in the Engineering Faculty take the first two Computer Science courses and part of the third year Computer Science course during their four year engineering degree.

Masters in Electrical Engineering in Telecommunications (MSC Elec Eng) is a coursework and dissertation Masters degree run by the Department of Electrical Engineering to provide skilled people for the telecommunications sector. Its first intake was in 2007. The Computer Science Department is a contributor to the courses in the degree and will play a greater role in the future with additional courses and research projects. This degree is seen as meeting a national and regional need and is considered a priority area within UCT.

## British Computer Society Accreditation

The Department has applied to the British Computer Society for Accreditation of its Undergraduate and B.Sc Hons CS degrees. This accreditation is required by the UK education authorities for all UK University Computer Science Departments. The Accreditation Panel visited the Department in April 2008 and is recommending our graduates for both CITP and Partial CSci (i.e. Chartered IT Professionals and partial accreditation as Chartered Scientists pending Masters/Doctoral work). We expect the BCS Board to accept this recommendation at its September meeting. Achieving this accreditation will make the UCT Computer Science qualifications internationally recognized at the same level of UK and European University Computer Science qualifications.

# Staff of the Department

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The Department of Computer Science at UCT is fortunate to be able to attract good quality staff with research experience from within South Africa and internationally. For the past 20 years the Department has been able to appoint permanent staff who have completed Doctorates in Computer Science, thus we have the basis for a good well established research culture. In addition, some of the staff are South African graduates who completed their Doctoral degrees at international universities and have returned to South African academia at UCT. The staff are:

## Head of Department and Professor

Ken MacGregor BSc Strathclyde, MSc Glasgow

## Professors

Edwin Blake BSc (Hons) Wits PhD London

Pieter Kritzinger MSc (Eng) Wits PhD Waterloo

## Adjunct Professor

Andrew Hutchison MSc HDE UCT PhD Zurich

## Associate Professors

Sonia Berman BSc Rhodes MSc PhD UCT

Gary Marsden BSc (Hons) PhD Stirling

## Senior Lecturers

Antoine Bagula M.Eng Louvain M.Sc Stellenbosch PhD KTH

James Gain MSc Rhodes PhD Cantab

Michelle Kuttel PhD UCT

Thi Hong Hanh Le PhD University of New South Wales

Patrick Marais MSc UCT DPhil Oxon

Audrey Mbogho M.Sc PhD City University of New York

Hussein Suleman MSc UDW PhD VPI&SU

## Lecturer - Academic Development Programme

Gary Stewart BSc (Hons) UCT

## Computer Systems Administrators

Craig Balfour

Ademola Freddy Adekayode

## Administrative Assistant

Salegga Valley

## Part-time Administrative Assistant

Eve Gill

## Senior Secretary

Jane Wright

## Receptionist

Bernie Sam

# Student Demographics

## Undergraduate

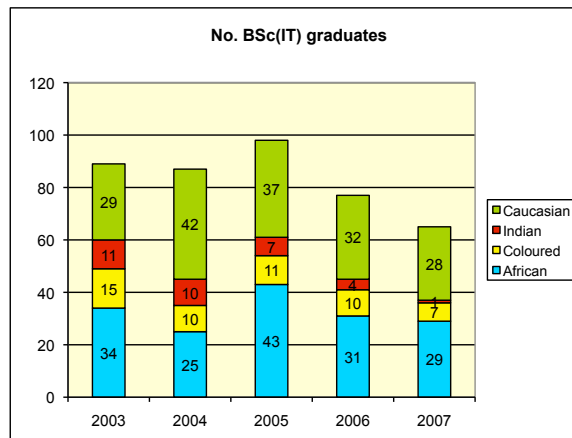
Entry to the BSc (IT) programme in the Faculty of Science at UCT is subject to the number of applicants to the Science Faculty in total and the quality, measured in matriculation results translated into points, of the applicants. The percentage of male applicants to female applicants is 77:23, which is in line with international figures. IT is seen as a male career with little interest being shown by females. International students, mainly from Africa, constituted 19% of BSc(IT) applicants.

Currently there are 293 students in the three years of the B.Sc programme

In 2007 the Department graduated 65 BSc students, 45% of whom were African, 13% Coloured or Indian and 43% Caucasian.

In 2006 there were 77 BSc(IT) graduates, 40% African, 18% Coloured or Indian, and 42% Caucasian.

In the three years 2003-2005 the Department graduated 274 students of whom 37% were African, 24% Coloured and Indian and 39% Caucasian. The ratio of female to male graduates was 16:84.

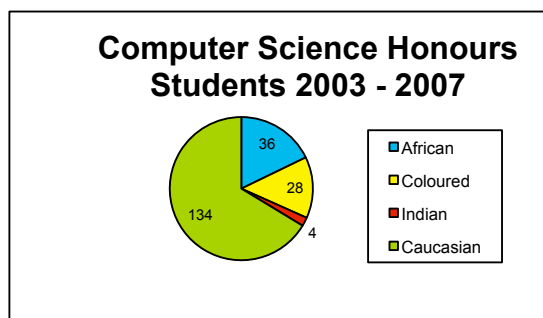


## Postgraduate

The numbers of currently registered postgraduate students and those who have graduated over the past three years are as follows.

### Honours in Computer Science and Information Technology

There are currently 35 students registered for this degree. In the past three years 2004-2006 the Department graduated 122 students of whom 19% were African, 13% Coloured and Indian and 68% Caucasian.



### Masters in Computer Science by dissertation only

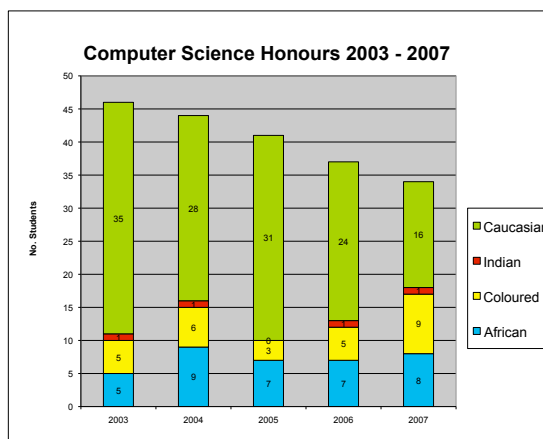
There are 38 students currently registered for this degree. In the past three years 2005-2007 the Department graduated 28 students, many with distinction.

### Masters in Computer Science by coursework and dissertation

There are currently 3 students registered for this degree. In the past three years the Department graduated 3 students.

### Masters in Information Technology

There are 35 students currently registered over the two years of this course, of whom 11 students registered for the first time in 2008. In the past three years the Department graduated 11 students.



### PhD in Computer Science

There are currently 24 students registered for this degree, which represents a recent and marked increase. In the past three years we have graduated 3 students.

# Extension/Outreach Activities

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## Student Programming Competitions

UCT students participate in both local and international students programming competitions with a large degree of success.

The Standard Bank IT challenge was introduced four years ago; it is managed by the British Computer Society on behalf of Standard Bank and provides a vehicle for Standard Bank to provide input into the development of programming skills. Participation is open to all South African Universities and encouraged by Standard Bank. The first three challenges (2005-2007) were won by teams from UCT. In 2008 the competition attracted eight entries from South African Universities and teams from Standard Bank. The UCT student team placed third after WITS and Stellenbosch.

The ACM ICPC is an international competition aimed at University students. The 2008 competition attracted entries from 6,700 teams selected from 1,821 universities in 83 countries. The Southern African region attracted entries from eight universities. A UCT team won the regional competition, as they have done every year since 2003. At the finals, held in Canada, UCT came joint 47th out of 100 teams, placing first in the Africa and Middle East Region. In the past UCT has placed as high as 7th position in this contest.

## Student Outreach

For many years the Department has organized the South African Computer Olympiad (SACO), which aims to identify and reward programming aptitude among high school learners and encourage more of them to take computer studies. SACO is the largest competition of its type in the world with a total of 465 schools entering 32,549 learners in 2007. The 2006 totals were 433 schools and 31,926 learners, so the participation in the competition is increasing. The ratio of girls to boys has improved to 46:54 as opposed to last year's 45:55. The Computer Science Department organizes the questions and solutions for all three rounds of the competition, administers the final round which is held in the Department, runs three training camps for the final six and a staff member accompanies the team to the International competition as coach.

Within the Department, we try as much as possible to engage with the wider community. Within Cape Town, we give talks at schools which target science subject for previously disadvantaged learners. This includes schools such as LEAP, COSAT and the Science Academy in Tokai. Furthermore, we have engaged in a programme of reaching out to other under represented groups, such as females, by giving talks at girls only schools such as Herschel and Sans Souci. Many of our postgraduate students also tutor part time at previously disadvantaged schools through a programme based in the Science Faculty.

The relationship with the wider community is furthered by our 'open evening' where local industry and school teachers are invited to attend an exposition of the research output and projects undertaken in the department. This event has been attracted a significant number of members of the community including the head of ICT education in the Western Cape.

## Professional

Members of the Computer Science Department play a significant role in the South African and International professional societies.

In South Africa, among the positions held by staff members are Past President of the South African Institute for Computer Science and Information Technology (SAICSIT), two members of staff are currently on the SAICSIT Committee, Chairman of the Western Cape Chapter of the CSSA, other member have been on the National Executive committee of the CSSA, Past president of Uniforum SA, members of the NRF ICT evaluation and programme panels, Two staff members founded Afrigraph, which is recognized by the ACM as a local Chapter, and organises a biannual Graphics colloquium and workshops in Africa with the aim of promoting research and knowledge in Computer Graphics. They are still members of this committee.

Internationally staff members represent South Africa on the International IT Society, IFIP, committees and working groups, are members of ISO standards committees. In addition, staff members serve on programme committees and as conference chairs of the organizing committees for both international and South African conferences, and on the Editorial Boards of international and local journals.

## Industry Liaison

The Computer Science Department has contact with a number of companies both large computer users and suppliers and small software companies in Cape Town. Among the companies the department has engaged in research and development projects are:

**TELKOM/Siemens:** The Department participates in the UCT TELKOM Centre of Excellence which is jointly sponsored by Siemens. The area of research is broadband communications and convergence of wireless and wired networks.

**IBM:** Established a LINUX Competency centre at UCT, predominately because of the LINUX experience which resides in the Department and which is operated by the Computer Science Department. It is used for commercial and parallel computing projects.

**Microsoft Research:** The Department is involved in projects with Microsoft research, which cover mobile communications and wireless technologies.

**T-Systems:** The Department has a security research laboratory sponsored by T-Systems. Prof. Hutchison who heads this research group and lectures in network security is Head of telecommunication services at T-Systems.

**Nokia Research:** The Department undertakes research in the use of mobile technology in disadvantaged communities with Nokia.

**Apple Computer:** The Department boasts two members of staff who are Apple Distinguished Researchers/Educators and is working with Apple to investigate how cellphones can be used as an education delivery platform.

**Black Ginger:** The Department undertakes joint research and development projects covering parallel rendering algorithms and animation techniques with Black Ginger a local animation and graphics company

**Complex Adaptive Systems:** The Department works with Complex Adaptive Systems on artificial intelligence projects using their Bayesian network simulator.

## ICT Innovations

ICT Innovations is a Unit of UCT run by the Computer Science Department whose aim is to give students commercial experience while they are studying for their degrees. It undertakes commercial development projects and employs students to implement them. Among the companies that ICTI have developed system for are: Barclays International, Nedbank, Standard Bank, CISCO Systems, Coca Cola and General Motors.



# Research

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The research in the Department is at the leading edge of computing but at the same time is aimed at designing systems that have specific application in the developing world. We produce students whose research work is publishable at an international level and can compete with those at overseas universities (see <http://pubs.cs.uct.ac.za/>). As a result, UCT Computer Science postgraduate students have obtained employment in advanced IT companies both in South Africa and internationally. In addition some of our postgraduate students have adopted the entrepreneurial route and started successful companies. Our staff also give courses, based on their research, to industry both locally and internationally.

Our researchers are well funded by international, governmental and industrial sponsors.

## UCT Research Centres

**Centre for Information and Communications Technology for Development (ICT4D):** Prof Marsden, Prof Blake and Prof MacGregor

This is a new centre created in response to the Department emerging as a world-leader in the application of ICT systems to the needs of the developing world. We have hosted researchers from Intel, Microsoft, Nokia, Palm etc. all wishing to study ICT4D with researchers from within the department. The centre is currently working on projects with the Meraka Institute (Pretoria) and Microsoft Research (Cambridge).

In 2009, the centre will host the **Hasso Plattner Research School** at UCT. This research school will support African PhD students working in the field of ICT4D.

## Research labs

The research is loosely organized in a number of research directions:

**Advanced Information Management Laboratory (AIM):** Prof. Berman and Prof. MacGregor

The AIM Laboratory deals with multiple facets of the information processing problem, exemplified by the following active research areas: databases; knowledge management systems; peer-to-peer computing; distributed computing and Web-based systems..

**Advanced Telecommunications Research:** Dr Bagula and Dr Le

The group aims to enhance the discipline of telecommunications through innovative applications with particular emphasis on socio-economic development; encourage the adoption of new telecommunication technologies through standardization; and promote the effective use of telecommunication in society through experimentation.

**Agents Laboratory:** Dr Potgieter, Dr Le and Dr Mbogho

The research in the Agents Lab is focused on computational intelligence and the use of adaptive agents. Research involves agent-based engineering of emergence in: Sensor Networks including RFID tags and Video Surveillance, Social Networks, Ontologies, Gaming, Value Networks and Anomaly Detection in Security Applications.

**Collaborative Visual Computing Laboratory (CVC):** Prof Blake, Dr Gain, Dr Marais and Prof Marsden

The Collaborative Visual Computing lab researches the interface between humans and computer systems. This research follows two main themes, computer graphics and human-computer interaction. The lab's approach is to develop systems that meet real needs, then evaluate the system to show that those needs have been met. We believe this approach ensures that we create graduates relevant to the needs of our country rather than focusing on the more theoretical approach to Computer Science.

**Data Network Architectures Group (DNA):** Prof Kritzinger and Dr Hutchison

The DNA lab focuses on the functional and temporal analysis of discrete, reactive systems, in particular computer networks

and their protocols. Research concerns all aspects from the design, specification, and analysis to the implementation of such systems and computer security is an important aspect of the work this group does. Current emphasis is on wireless mesh networks and ways of Connection Admission Control (CAC), security in such a highly vulnerable environment and general aspects of Admission, Authentication and Accounting in wireless networks.

**Digital Libraries Laboratory:** Dr Suleman

The Digital Libraries Laboratory conducts research and provides support for information management problems with particular emphasis on the developing world with its associated unique constraints, such as cultural differences, limited Internet bandwidth and limited access to skilled staff. Our activities are research-focused, but include some advocacy, training and consulting. Our work is oriented towards the goal of making all forms of information (heritage, research, education, etc.) more accessible to all people.

**High Performance Computing Laboratory (HPC):** Dr Kuttel, Dr Gain, Dr Suleman and Dr Marais

The High Performance Computing laboratory/group investigates problems related to computational science, grid and cluster computing, scalability of systems, visualization and large scale data management.

## Publications 2007-2008

### Articles in peer reviewed journals

Antoine B. Bagula and Gaston Mazandu. (2008) "Energy Constrained Multipath Routing in Wireless Sensor Networks". Lecture Notes in Computer Science, Vol 5061/2008, pages 453-467, June 2008.

Antoine B. Bagula. (2008) "On Achieving Bandwidth-aware LSP/LambdaSP Multiplexing/Separation in Multi-layer Networks". IEEE Journal on Selected Areas in Communications (JSAC): Special issue on Traffic Engineering for Multi-Layer Networks, Vol 25, No 5, June 2007.

Gain, J. and Bechmann, D. (2008) "A Survey of Spatial Deformation from a User-Centered Perspective", to appear ACM Transactions on Graphics, October 2008.

Marsden, G., Maunder, A. and Parker, M. (2008) "People are People, but Technology is not Technology" Philosophical Transactions of the Royal Society A, October 2008, pp 1-10.

Marsden, G. (2008) "Toward Empowered Design," IEEE Computer, 41(6), pp. 42-46.

Marais, Patrick and James Gain (2007) High fidelity compression of irregularly sampled height-fields. South African Computer Journal 38:40-50.

Marais, Patrick, James Gain and Dave Shreiner (2007) Distance-Ranked Connectivity Compression of Triangle Meshes Computer. Computer Graphics Forum, Vol. 26, No. 4, pp. 813-823, 2007.

C Rouse and S Berman (2007) "Mapster: A Peer-to-Peer Data Sharing Environment" South African Computer Journal, vol. 39, pp. 35 – 46, December 2007.

### Patents

Maunder, A., Marsden, G. and Harper, R. (2007) "Shoot and Carry". US Patent Number: 319607.01

### Peer Reviewed Published Conference Proceedings

Ah-Kun, L. & Marsden, G. (2007) "Co-Present Photo Sharing on Mobile Devices" Proceedings Mobile HCI 2007. Singapore. ACM Press. Pp73-80.

Arnab, Alapan and Andrew Hutchison (2007) DRM Use License Negotiation using ODRL v2.0. In Proceedings 5th International Workshop for Technology, Economy, and Legal Aspects of Virtual Goods, incorporating the 3rd International ODRL Workshop., Koblenz, Germany.

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Berman, Sonia and Katoma, V. (2008) "An e-Learning Model Based on Collaboration and Sharing" Proc. 3rd International Conf on eLearning, ICEL 2008, Cape Town, June 2008.

C Rouse and S Berman (2008) "A Management System for Integrated Querying of Web Databases" Proc. 10th WWW Conference, Cape Town, September 2008.

Blake, Edwin, David Nunez and Bertus Labuschagne (2007) Longitudinal Effects on Presence Suspension of Disbelief or Distrust of Naive Belief(2007). In Moreno, Laura, Eds. Proceedings PRESENCE 2007 The 10th Annual International Workshop on Presence, pages 291-295, Barcelona, Spain.

Blake,E, Sarah Brown, and David Nunez. (2007) Virtual environments to support people living with HIV. In Paul Cunningham and Miriam Cunningham, editors, IST-Africa 2007 Conference Proceedings. IIMC International Information Management Corporation, 2007.

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Karodia, R., Lee, S., Mehta, A. and Mbogho, A. 2007. A Visual Tagging SDK with Encryption and Parameterisation. Proceedings of the Fifth IEEE Workshop on Automatic Identification Advanced Technologies (AutoID 2007), Alghero, Italy, 186-191. ISBN 1-4244-1300-1.

Kritzinger, PS and PP Pileggi (2007) Performance Modeling of the Wireless Internet. In Proceedings Wireless Rural and Emergency Communication Conference 2007, Rome, Italy.

Labuschagne, Bertus, David Nunez and Edwin Blake (2007) Presence predicts false memories of virtual environment content. In Moreno, Laura, Eds. Proceedings PRESENCE 2007 The 10th Annual International Workshop on Presence, pages 297-301, Barcelona, Spain.

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Maunder, A., Marsden, G. & Harper, R. (2008) "SnapAndGrab – Accessing and sharing contextual multi-media content using Bluetooth enabled cameraphones and large situated displays." Proceedings CHI 2008. Florence, Italy. ACM Press pp 2319-2323.

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- Marsden, G., Lee, K. and Ah Kun, L. (2007) "Peepholes With no Strings Attached" Proceedings SAICSIT 2007, East London, pp.1-8.
- Mbogho, Audrey J.W. and Lori L. Scarlatos (2007) Genetic Parameter Tuning for Reliable Segmentation of Colored Visual Tags. In Thierens et al., Dirk et al., Eds. Proceedings Genetic and Evolutionary Computation Conference II, pages 1525, London, England.
- Nyirenda, Mayumbo and Hussein Suleman (2008) X-Switch: A Secure, Multi-User, Language-Independent Web Application Server. In Proceedings CARI 2008, Rabat, Morocco.
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- Sharpey-Schafer, Kieran and Hussein Suleman (2008) Evaluating Health Information Systems for Developing Countries using Simulation. In Proceedings IST-Africa Conference 2008, Windhoek, Namibia.
- Suleman, Hussein (2008) Automatic Marking with Sakai. In Proceedings Annual Conference of South African Institute of Computer Scientists and Information Technologists (SAICSIT), Wilderness Beach Hotel, Wilderness, South Africa.
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- Suleman, Hussein (2007) Managing Digital Library Components. In Proceedings Second Workshop on Foundations of Digital Libraries, Budapest, Hungary.
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- Tucker, B. and Blake, E. (2008) The role of outcome mapping in developing a rural telemedicine system. In Paul Cunningham and Miriam Cunningham, editors, IST-Africa 2008 Conference Proceedings, Windhoek, Namibia, 2008. IIMC International Information Management Corporation.
- Van Biljon, J., Kotze, P. and Marsden, G. (2007) "Factors Affecting Mobile Handset Choice" Proceedings INTERACT 2007, San Paulo, Brazil. Pp 523-527
- Winterbottom, C. and Blake, E. (2008) Constructivism, virtual reality and tools to support design. In Gary Marsden, Ilda Ladeira, and Paula Kotze, editors, Proceedings of the 7th ACM Conference on Designing Interactive Systems — DIS 2008, pages 230–239, Cape Town, South Africa, 2008.
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- M. Zennaro, B. Pehrson and A.B. Bagula. " Wireless Sensor Networks: a great opportunity for researchers in Developing Countries". To appear in the Proceedings of WCITD'2008 Conference, Pretoria, South Africa, October 2008.

M. Zennaro, H. Ntareme and A.B. Bagula. " Experimental Evaluation of Temporal and Energy Characteristics of an Outdoor Sensor Network". To appear in Proceedings of PAWN-08 Conference, Ilan, Taiwan, September 2008.

Gaston K. Mazandu, Antoine B. Bagula and Lena Wosinska. " Impairment Aware Multi-Path Routing. in GMPLS-Based Networks ". in Proceedings of Optical Fiber Communications Conference OFC/NFOEC 2008, Los Angeles, USA, March 2008.

Americo Muchanga, Antoine B. Bagula and Lena Wosinska. "On Using Fast Signalling to Improve Restoration in Multilayer Networks". in Proceedings of Optical Fiber Communications Conference OFC/NFOEC 2007, Los Angeles, USA, March 2007

J. Lane, A. Engelbrecht and J. Gain, "Particle Swarm Optimization with Spatially Meaningful Neighbours", IEEE Swarm Intelligence Symposium, Missouri, 21-23 September 2008.

S. Perkins, D. Jacka, P. Marais and J. Gain, "A Spatial Awareness Framework for Enhancing Game Agent Behaviour", In Proceedings of the 2008 ACM SIGGRAPH Symposium on Video Games (Los Angeles, California, August 09 - 10, 2008). Sandbox '08. ACM, New York, NY, pp. 15-22.

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