

benefits for each person and for society as a whole beyond the more obvious applications in industry. This project group aims to be the focal point in the creation of a critical mass of research in intelligent sensing environments.

Ontologies, semantic web and reasoning

An abundance of information leads to the problem of information overload, making it increasingly difficult to locate relevant information. Any satisfactory solution to this problem will have to involve ways of making information machine processable, a task which is only possible if machines have better access to the semantics of the information. It is here that ontologies play a crucial role. This research group constitutes the first steps towards establishing and growing a world class research group centered around the development of technologies for constructing, maintaining and using ontologies.

NyandaWeb co-investment

NyandaWeb/ sensor web is an initiative for the development of an extensive sensing and monitoring system that provides comprehensive, continuous, near real-time transport- and traffic related information for research, transport planning and traffic operations and management.

Congested network real-time video streaming

Although broadband technologies, both wired and wireless, have become available in South African urban areas it is still relatively expensive and has exacerbated the network congestion problems on our telecommunications infrastructure. The net result is that broadband is not quite broadband and the effective bit rate in an end-to-end video application varies widely from any given moment to the next. This project investigates the establishment of a core research, development and resource unit on real-time video coding.



Mobile technologies and applications

There is a strong need in South Africa to build up mobile application R&D competence in order to take advantage of the mobile phone phenomenon by building domain-specific mobile applications, such as the

educationally-focused MobileD platform. The intention is to build on this expertise to create a more generic technical platform that can be used in a variety of domains and to do focused research and development in the mobile applications space.

W3C Sub-Saharan office

The World Wide Web Consortium (W3C) is the de-facto international consortium that determines the future evolution of the web by executing its mission of developing protocols, standards and guidelines to ensure the long term growth of the World Wide Web, and maintain its global relevance as a key mechanism in the future information society of Southern Africa by establishing a local W3C office at the Meraka Institute.

Living Labs for information society applications

A Living Lab provides a platform for researchers, universities, industry and communities to collaborate for the creation, prototyping, validating and testing of new services, products and systems in real-life contexts. This project will focus on ICT R&D in a rural developing community.

Large ICT Demonstrator – UAV

This project aims to establish an ICT technology demonstrator focusing on unmanned aerial vehicles to build local technology capability and to enhance technology use and deployment in government, while stimulating collaboration across sub-disciplines among a large number of players operating at different points in the innovation chain. The creation of a development and integration capability in ICT is also encouraged in this way.

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INFORMATION AND COMMUNICATION
TECHNOLOGY RESEARCH & DEVELOPMENT AND
INNOVATION STRATEGY
IMPLEMENTATION PROGRAMME



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In response to the potential that Information and Communication Technology (ICT) represents to socio-economic development, and as envisaged in the DST National R&D Strategy of 2001, the DST facilitated the development of the ICT R&D&I (research and development and innovation) Strategy. Anticipating the approval and implementation of the Strategy, the DST in 2005 initiated the establishment of critical mass research in R&D in ICT through three ICT R&D flagship projects led by the Meraka Institute. Progress on the ICT R&D flagship projects as well as in the finalisation of the ICT R&D&I Strategy, have enabled the DST to secure additional funding for ICT R&D&I. Since March 2007 the allocation to the Meraka Institute, the implementation Agency, has been significantly increased to fund a total of 18 projects under the ICT R&D&I Strategy Implementation Programme.

Human Language Technologies (HLT)



HLT refers to a range of speech- and language-based technologies, like text- and speech processing, or automated translation systems. The main aim of the proposed programme is to develop and grow a world-class research capability in HLT, which addresses research problems relevant to South Africa's national priorities.

Time series analysis of satellite data to monitor climate change impact

Existing methods for time-series analysis of satellite data are insufficient, since data volumes are prohibitively large (> 10 Terabytes). Conventional image data structures cause massive Input/Output bottlenecks which impedes effective time-series analysis while its computational intensity far exceeds the capability of single workstations. The Remote Sensing Research Unit focuses on developing capacity and methods for detecting the impact of climate change on terrestrial ecosystems.

Intelligent environments for independent living (IE4IL)

Advances in information and communication technology (ICT) are increasingly allowing many persons with disabilities to live independently and to be active participants in society. This research group conducts research and development in ICT that will contribute to improving the

quality of life for persons with disabilities and the aged, specifically in the South African context.

Community wireless mesh networks

The low penetration of basic information and communication technology infrastructure such as basic telephony and internet, is isolating Africa from the global information society. Although cellular networks are showing impressive growth in Africa, pervasive broadband access needs new paradigms and thinking to create a significant breakthrough. The Wireless Africa programme is an R&D programme focused on research and development connecting 450 million rural people in Africa to each other and to the rest of the world.

Geomatics and spatial technologies (ICT4EO)

The need to maximize benefit from the investment in earth observation is well recognized at both national and international strategic levels (e.g. GEO, SAEON, GEOSS). The mission of the ICT for earth observation research group is to develop human capital and world-class expertise in computing technologies for earth observation and geographic information science through the research and development of distributed technology platforms, such as Sensor Web, which is an open and publicly accessible information sharing technology.

ICT in education



The concept of ICT in Education, or e-Education is strongly supported in the national e-Education White Paper as published in Sep 2004. E-Education goes beyond that of the traditional computer connected to a network – it encompasses a whole realm of new technologies like human language technologies, “smart-”, wireless-, handheld- and merging media devices, and high performance computing concepts and facilities. The ICT in

Education focuses on technology research, development and innovation in support of education outcomes within the national school system.

Scientific-Ubuntu distribution

The national R&D strategy stresses the importance of investing in ICT to foster local development and globalization, specifically mentioning

open source software as an investment area. The aim of this project is to develop an Ubuntu-based Linux distribution (Scientific-Ubuntu), for use by scientists, to enable scientific computing on Linux.

Nokia-Siemens telecommunications research Centre

The Nokia Siemens Meraka Centre for Telecommunications Research is being established to foster excellence in research relevant to new wireless communications technologies. This Centre is initially geared to promote low-power, low cost solutions for wireless connectivity, and thereby enable new economic growth for many African villages currently without good telecommunications facilities, like person-to-person, local data access, and the www through wide-area links.

Information security centre of competence

Through various discussions amongst scientists and academics, thinking was developed around the need to build and strengthen South Africa's national competence in information security. This is a project to establish an information security unit within the CSIR Meraka Institute to focus on limiting exposure to risks related to privacy, trust, and the complexities of inter dependent information systems. A further focus will be to maximize the availability, integrity and confidentiality of information and systems (2007/8 Objectives).

National software development capability



Software plays a key role in the information society and is an essential enabler of government service delivery as well as various industry sectors. The ability to produce software and deliver services in an efficient way is a fundamental capability that a modern economy requires. This project is developing a national software R&D plan and road map for South Africa, strengthening software development capability through skills intervention, and developing tools, guidelines and mechanisms in support of open source software platforms.

Distributed sensor networks

Omnipresent intelligent sensing environments have a promising future in supporting the everyday life of citizens, bringing important social