

## AWARDS, HONOURS AND ACHIEVEMENTS

- Stipendium of the Alexander von Humboldt Foundation for research at the *Institut für Kommunikationsforschung und Phonetik*, Bonn, Germany (1982, 1987, 1994 & 2018)
- Certificate of Acknowledgement of Leadership in International Research from the Vice-Chancellor of North-West University (NWU) (2010)
- Vice-Chancellor's Award for Outstanding Research from University of Stellenbosch (SU) (1999)

## DEFINING MOMENT

In 1998, Roux participated in the first International Conference on Language Resources and Evaluation in Granada, Spain, where he realised the pressing need for the development of digital language resources for African languages for various technological applications.

## WHAT PEOPLE MIGHT NOT KNOW

"While my culinary skills do not extend beyond making a cottage pie, I do know my way around wine varieties."

## BRINGING AFRICAN LANGUAGES TO THE DIGITAL AGE

South Africa is home to eleven official languages, but for a long time only two have had the proper digital treatment by apps, such as Google Translate: English and Afrikaans. Luckily the other nine are now not far behind, thanks in part to Justus Roux, who has been promoting and developing technology and digital resources for African languages for more than 40 years.

Roux graduated with a degree in African languages in the late 1960s at Potchefstroom University (now the North-West University), and then completed a Master's in 1971. After a short period of lecturing at the university, he moved to Stellenbosch and in 1979 completed a DLitt in African languages. "My doctorate focused on Sesotho and was quite interdisciplinary," he says. "It comprised linguistics, experimental work in speech acoustics, speech physiology measuring nasal and oral airflow patterns in speech production, and lip and tongue movements through cine-fluorographic techniques before the advent of video."

"We realised that if you make phonetic descriptions of a language, you can't just do it impressionistically, you have to have some instruments to support your views." Hence his entry into the field of experimental phonetics – the study of how speech sounds are formed, transmitted and perceived as part of communication. "At that time, we didn't have the proper laboratory apparatus to do experimental phonetics," he recalls. Fortunately, colleagues at various universities shared their instruments and knowledge which enabled him and his colleagues to do acoustic and physiological measurements of people speaking Sotho.

Roux's next stop was the University of Bonn in 1982 to learn the latest computer-based techniques in experimental phonetics. In 1987, he moved to the Fraunhofer Institute in Stuttgart to synthesise Xhosa speech for the first time. "These experiences were extremely valuable for me," he says, and he went on to set up an experimental phonetics laboratory at SU.

As the 1980s drew to a close digital technologies became more important, and Roux saw great opportunities for the improvement of research in language and the humanities in general. The 1990s saw the expansion of human language technologies (HLT). These technologies support communication between humans, as well as between humans and machines in natural language. Google Translate and Apple's virtual assistant, Siri, are recent examples of HLT, where interaction can take place through spoken language.

## HUMAN LANGUAGE STRATEGY

"South Africa had been lagging behind, but in 2000, I coordinated an advisory panel tasked with creating an HLT strategy for South Africa." This eventually led to government support for various language projects across the country. He further helped launch HLT by leading the African Speech Technology Project, the first major project of its kind. "A consortium of universities successfully developed a prototype automated telephone-based hotel reservation system that worked in five languages: Afrikaans, English, Zulu, Xhosa and Sotho," he says. "This project also served as a learning curve for many prominent South African researchers in this field."





Roux chaired a task team of the Department of Arts and Culture in 2010, set up to create a blueprint for the establishment of a Language Resource Management Agency which led to the founding of a national centre in 2016. Also in 2016, the then Department of Science and Technology, now the Department of Science and Innovation (DSI) introduced the South African Research Infrastructure Roadmap and Roux started lobbying for a national centre for digital language resources, supported by colleagues in the field.

“Usually these roadmaps only support the natural sciences and not the humanities,” he says. “We made a presentation to get onto the roadmap so that we could systematically develop digital resources for all official languages, to be used in various language technologies like machine translation and speech recognition.”

Roux spearheaded the establishment of the South African Digital Language Resource Centre (SADiLaR) in 2016 and was Director until his retirement at the end of 2017. He believes that SADiLaR will generate data for linguistics research and technology development for all of South Africa’s eleven official languages. “SADiLaR provides a vision for developing and supporting a multilingual democracy,” he explains. “The technologies are there; what is needed is large sets of digital text and speech data and that is what the centre is geared to deliver.”

Roux’s other passion is the growing trend of digital humanities (DH) which he has been promoting in the country. He helped establish the Digital Humanities Association for Southern Africa (DHASA), and currently serves as President. Apart from its resource development function, SADiLaR is also committed to promoting and stimulating academic capacity-building in this emerging field where digital technologies and humanities meet. “South Africa’s multicultural context creates an interesting opportunity for DH-based research and project development.”

Roux’s expertise in DH and HLT has been sought after the world over, and he has contributed to many professional bodies over the years, leading South African delegations to annual ISO Technical Committee meetings, presenting at international workshops and participating in international scientific committees. Notably, he has been a member of the Suid-Afrikaanse Akademie vir Wetenskap en Kuns since 1980.

Roux’s research contributions have certainly helped to carve a space for African languages to take part in the ongoing digital revolution.

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# Legends of South African Science II

**Academy of Science of South Africa (ASSAf)**

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