



SOUTH AFRICAN COMMUNITY BASED CO-DESIGN PROJECTS

by **BANG**

Bridging Application and Network Gaps (BANG) is a research group in the Computer Science Department at the University of the Western Cape (UWC). We investigate, design and produce Information and Communication Technology for Development (ICT4D) by working with real South African communities, industry partners, NGOs, formal and informal governance bodies, and other universities; together with multi-disciplinary teams in order to bridge digital gaps in an increasingly networked world.

Our Computer Science-oriented work operates at the intersection of mobile computing, Internet Protocol and telecommunication networks, human computer interface, and software engineering. We learn and employ technical, social and economic skills to address tough challenges via community engagement. We have successfully innovated bottom-up and fully open source communication alternatives with and for two marginalized South African communities. We have progressed our understanding of ICT4D from extensive longitudinal experience and engagement with both communities. We have learned that even though the two application domains are vastly different, the research results are very similar and bode well towards achieving some important goals and objectives of the South African National Development Plan (NDP) 2030.

We believe that alternative forms of information and communication technology as demonstrated by these two projects can make a real and measurable difference in the South African digital landscape. Our findings, prototypes and most importantly, our postgraduate students, can provide valuable examples and resources for how to increase the size of the South African telecommunications pie so that all can benefit.



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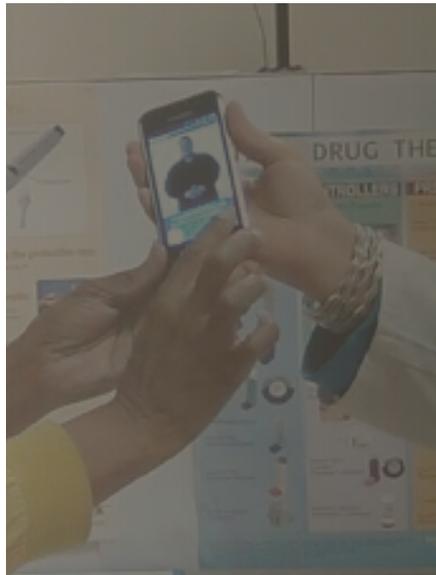


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SignSupport is a mobile app that orchestrates pre-recorded signed language videos stored on the device, incurring no mobile data fees for the Deaf end user. The initial idea stemmed from Deaf people through community-based co-design. We have realized this into functional prototypes.

SignSupport for pharmacy follows a protocol defined by pharmacists to gather and provide health information in SASL to support a Deaf patient's understanding of the diagnosed condition(s) and treatment adherence.

The pharmacist taps prescription directions in text.



The Deaf user views data in signed videos.

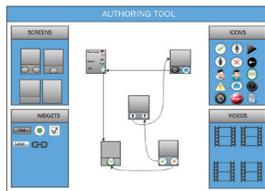
- The pharmacist takes a photo of the medication and explains what to do by tapping in the data step by step.
- These instructions map to pre-recorded signed language videos, and the Deaf patient views the instructions in SASL.

SignSupport for ICDL training provides support to Deaf learners pursuing computer literacy skills by providing lesson content in signed language videos. This allows Deaf learners to learn at their own pace, in front of a PC, with a mobile aid.



The computer literacy app provides lessons in pre-recorded SASL videos.

An authoring tool for SignSupport allows domain experts without programming skills to design the 'communication' with Deaf people for different communication scenarios, e.g., the two scenarios above or others. An interpreter helps a Deaf signer populate the scenario with video clips.



An authoring tool allows a scenario expert to design a SignSupport flow.

With Design for All in mind, the SignSupport concept is addressing the challenge of bridging gaps between Deaf and hearing people as a reference implementation to do so with any illiterate end user, in any language. While SignSupport only addresses limited domain scenarios, we fully recognise the need for free-form translation of both information and communication. Therefore, we are also working on a video relay service, to translate between signed and spoken language via a remote interpreter.

PROJECT: SignSupport

Since 2001, we have designed novel assistive technologies with and for a marginalized and under-employed Deaf community in Cape Town. These Deaf people are proficient and fluent in signed language, yet due to poverty and under-education exhibit limited functional literacy with written and spoken language when interacting with a hearing majority. A multi-disciplinary and trans-university team is currently busy with iterative and incremental design and evaluation of a mobile tool suite that bridges information and communication gaps between Deaf and hearing people, in the language that these Deaf people understand: South African Sign Language (SASL). We are generalizing this tool to handle a) multiple limited interaction scenarios, b) multiple languages for illiterate users, and c) multiple mobile platforms. There are currently two scenarios in prototype: pharmacy and international computer driver license (ICDL) training. Diabetes and antenatal care scenarios are works in progress.