Chapter 18

Design Analytics of Complex Communication Systems Involving Two Different Sensory Disabilities

Gahangir Hossain
Texas A&M University-Kingsville, USA

ABSTRACT

The design of a robust communication among two different sensory disabilities (Deaf vs. Blind) remains an emerging field of research in disability healthcare communication system design. As an important part of modern technology, android and iPhone applications are frequently used in designing such communication systems. However, there is no ‘one-size-fits-all’ in case of different sensory disability health communication design. Hence, an in-depth understanding of their requirement, media preferences, similarity and difference and up-to-date technology usability are plausible towards universal and personalized communication system design. This research addresses such complex issues and performs a study involving two different types of disabilities (deaf and blind) communication. As a part of healthcare analytics, critical incidences are recorded and corresponding complexities are measured in order to evaluate communication protocol with social signal processing. Communication flow diagram, complexity analysis and critical incidence are quantified to improve communication protocols. Moreover, the uniqueness of disability can be personalized through this process which has valuable implications in rehabilitation and multi-purpose healthcare communication device development.

INTRODUCTION

According to a world report on disability (World Report, 2011; World Program of Action, 2007) over one billion people around the world have some type of disability. Twenty five percent of the population in a given country is adversely affected by the presence of some form of disability. Out of hundreds of millions of children who are not in school, thirty to forty million have sensory disabilities. Over fifty-
four million people in the US have some form of a disability. Out of seventy million families, twenty million have at least one family member who has a disability. Canada, Bangladesh, Pakistan, and Egypt reported to have four million, seventeen million, nine million and seven million people with sensory disabilities, respectively (People with Disabilities in India, 2007; Foulgers, 2004).

Since sensory disabilities are highly prevalent worldwide, it is necessary to design a robust and effective communication solution. Recent developments of communication technology within integrated technology devices (smart phone, tablet, pad etc.) may help to bridge the gap between people with and without sensory disabilities. People with disabilities are becoming more technologically aware and are adopting emerging applications with technology devices. With premium training and assistance, they can adopt modern technology for social networking as well as managing their daily lives. While assistive technology solutions are helpful, in many cases, they are not interoperable to bridge communication gaps between people with mutually exclusive types of sensory disabilities (for example, deaf vs. blind or deaf-blind). One viable solution to overcome this obstacle is to have technological devices with universal design. However, sensory disabilities are more personalized and there is no “one-size-fits-all”, which requires an in-depth study of their opinions in action (Aslaksen et al., 1995; Russell et al., 1993)

Let us consider the conversation among four assistive technology expert users (Figure 1): John, Bob, Doris, and Debra. John is an experiment designer for people with cross-disability. Bob is a blind instructor with ten years of experiences in teaching people who are blind or visually impaired. Doris, who is hearing impaired (deaf), works with Bob in the same school, teaching students who have hearing problems. Debra, who is both deaf and blind, also works with Bob and Doris. Their actual names are changed to preserve the confidentiality agreement. Bob can communicate through speech, audio feedback, and tactile communication methods (Braille), but prefers voiceover feedback. Doris favors sign language to other modes of communication. Deborah loves the Braille communication tools. She also knows signing, animal behavior, auditory feedback, etc. The main theme of their conversation was to ascertain an optimal mode of communication between a deaf person and someone who is blind with the cutting-edge technology of smart phone applications. Naturally, their conversations are different from traditional inter

Figure 1. Communication between different sensory disabilities (Deaf, Blind, Deaf-Blind communication)
15 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the product's webpage: www.igi-global.com/chapter/design-analytics-of-complex-communication-systems-involving-two-different-sensory-disabilities/195777?camid=4v1

This title is available in InfoSci-Books, Communications, Social Science, and Healthcare, InfoSci-Medical, Healthcare, and Life Sciences, InfoSci-Social Sciences and Humanities, InfoSci-Select, InfoSci-Select, InfoSci-Select, InfoSci-Select. Recommend this product to your librarian: www.igi-global.com/e-resources/library-recommendation/?id=1

Related Content

Survey of Medical Image Compression Techniques and Comparative Analysis
www.igi-global.com/chapter/survey-of-medical-image-compression-techniques-and-comparative-analysis/159758?camid=4v1a

Assessing Joint Stability from Eigenvalues Obtained from Multi-Channel EMG: A Spine Example
www.igi-global.com/chapter/assessing-joint-stability-from-eigenvalues-obtained-from-multi-channel-emg/110763?camid=4v1a

Computational Inference of Gene Regulation from Whole-Transcriptome Analysis of Early Embryos
www.igi-global.com/chapter/computational-inference-of-gene-regulation-from-whole-transcriptome-analysis-of-early-embryos/155031?camid=4v1a

Diffusion of Innovations: A Foundational Theory for Medical Informatics Research
www.igi-global.com/chapter/diffusion-of-innovations/97410?camid=4v1a