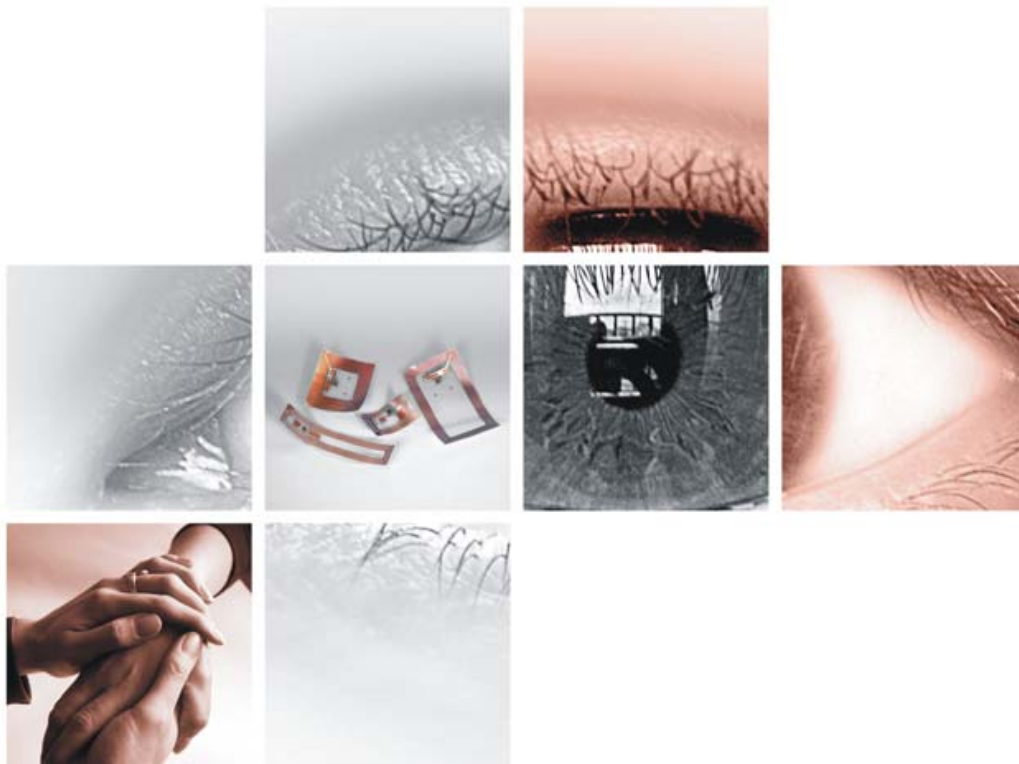


SLOVAK UNIVERSITY OF TECHNOLOGY, SLOVAKIA

SPOT

GOING BEYOND THE VISION LOSS BOUNDARIES

CSIDC 2005 Final Report



TEAM MEMBERS

Martin Adam
Michal Barla
Peter Sivák
Michal Tvarožek

martin@atrip.sk
crutch@seznam.cz
psivak@netcomga.sk
tvarozek@gmx.net

PROJECT MENTOR

Mária Bielíková, PhD.

bielik@fiit.stuba.sk
+421 2 60 291 473

Abstract

Nowadays, vast amounts of information are available to many people all around the world. What is more, the volume of available information is growing daily and it thus becomes increasingly difficult to organize, search and access this information. The problem of information processing will become even more severe when people from currently less developed countries start using and adding to this information at a scale comparable to developed countries.

In order to respond to the challenge of present and future information processing needs, we devised a concept which allows for organizing and finding relevant information, related to a particular physical environment, quickly and efficiently. Moreover, it enables us to supply this information to people who need it at places they need it and at the exact time they need it – to anyone, anywhere and anytime. In this way, it eases off the threat of excess information and thus goes a step beyond the current boundaries of information processing capabilities.

A system based on the proposed concept uses RFID (Radio Frequency Identification) tags to tag various entities in the environment with the purpose of providing people with contextual information. A mobile device is used to read data from these RFID tags and to retrieve meaningful information associated with them, which is presented to the user in an appropriate form (e.g., in spoken form for the visually impaired).

To demonstrate the real-world impact, which a system capable of advanced information processing and access can provide to society, we looked for something that could cause a small “revolution” within its field of application. Finally, we decided to develop the SPOT-IT system, which uses the described concept to offer aid to the many visually impaired or completely blind people living in the world today. Alone in the U.S. there are 750,000 blind people while some 8.9 million people suffer from low vision [13]. The situation is similar in other developed countries and even worse in developing countries. Worldwide there are close to 161 million people suffering from significant visual disability, 37 million of whom are blind [22].

These people many a time have to rely on others to help them perform various daily tasks. This is mostly because blind or low sighted people lack information about their surroundings, which sighted people receive naturally by simply looking around (even unconsciously). The purpose of the SPOT-IT system is to provide blind and low sighted people with contextual information about their surroundings, thus enabling them to know (i.e., “to see”) what is around them. Such newly gained information will in turn enable them to be more independent and self-sufficient, since they will no more have to rely on others to provide them with this information or perform tasks based on this information.

Ideally, the ultimate objective of the SPOT-IT system would be to make visionless people completely independent, but this would hardly be possible unless one truly restored their sight and enabled them to see the same way as visually unimpaired people see. Thus, the prime objective of the SPOT-IT system is to increase the level of independence of blind and visually impaired people by going a step beyond the current boundaries of seeing aids.

SPOT-IT is only one example of the concept’s overall potential, since the result of this project is applicable to a whole family of systems designed for a particular application domain. At the same time, the functionality of the SPOT-IT system is extensible to other applications also for sighted people thus providing new possibilities of information acquisition and processing resulting in a variety of socially valuable applications. It employs several on-coming technologies such as RFID or human body transmission and introduces several notable innovations including a novel way of associating information with real-world entities.