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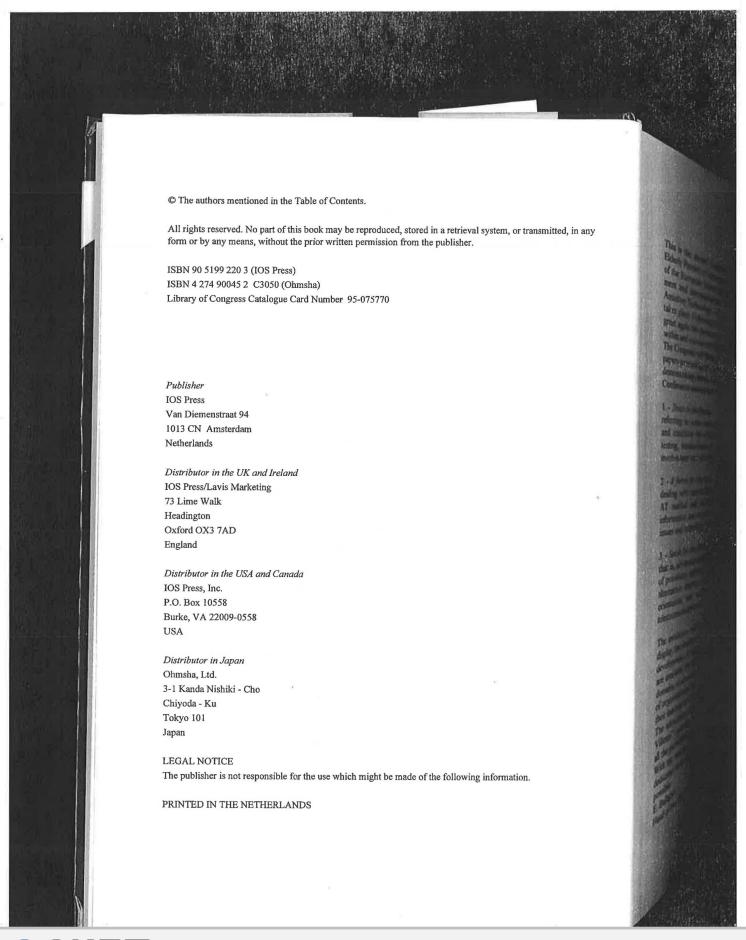
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Isaac – A Personal Digital Assistant for the Differently Abled

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Abstract. Designed to be used as an aid for individuals with cognitive dysfunctions, Isaac combines in one unit a pen-based computer, a digital camera, a GPS satellite navigation receiver, and cellular phone channels for both voice and data. This paper deals with Isaac as an experimental product, the arrangement and procedure of the ongoing user test and its results so far, and the challenging questions and ideas raised by the mere existence of Isaac.

1. Introduction

The aim of the Isaac project is to increase the independence of differently abled persons by enabling them to do more on their own and to decide themselves when they want to use the option of interacting with their relatives or the staff. A secondary purpose of the Isaac project is to find out how advanced technology affects daily routines and influences organizational structure.

The project has grown out of an existing cooperation between group homes in Lund for adults with cognitive dysfunctions and CERTEC, the Center for Rehabilitation Engineering at Lund University. Since September 1994, when the initial technical phase was completed, there has been a systematic search for different kinds of user experiences.

Fig 1. Isaac is based on Sharp´s version of Apples Newton with a CCD camera and phone handset integrated in a modified cover.

2. Isaac - an experimental product

Isaac combines in one unit a pen-based computer, a digital camera, a GPS satellite navigation receiver, and cellular phone channels for both voice and data. The handheld unit contains a miniature still camera. A picture is taken when a viewer window on the screen is touched, and a moment later a greyscale image appears. The picture can be immediately transmitted to the support center or just stored to be included in the personal picture data base and later printed on paper with photorealistic quality.

A receiver for the GPS satellite navigation system provides accurate coordinates in most outdoor locations. The latest position is stored and can be retrieved by the support center at any time. When privacy is preferred, this function can easily be disabled by the Isaac user.

Sequences of images on the screen can be used to guide the user in navigating on a walk, performing a repetitive task at work, cooking a meal, or doing the morning ritual properly.

The user operates Isaac through an LCD touch screen capable of showing greyscale images with reasonable quality. Interaction is based on symbols and pictures, avoiding text according to the user needs. The telephone directory is shown on the screen as faces instead of names and phone numbers. Dialling is automatic after touching the appropriate picture, and the back of the screen contains the handset.

A number of such mobile units can be in wireless contact with a support center providing assistance over the phone based on pictures, position data and other kinds of information managed by the system.
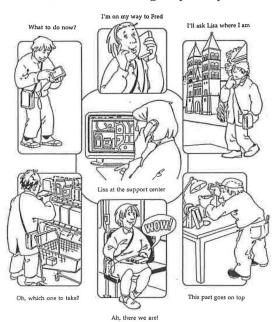

Fig 2. A wealth of capabilities

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