

# Convene – MUD interfaces for disabled users

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Convene is a problem oriented project regarding communication interfaces for disabled users. We have chosen to especially study interfaces for MUD (Multi User Dimension) systems, i.e. environments where multiple users interact in a common virtual environment, often in the form of a game. The results will be applicable in other areas, as the interactions in a MUD comprise most aspects of communication.

In the first, ongoing phase, we identify the problems specific to our user groups. These problems include handling fast interactions among participants, navigation in the MUD world, and general communication skills. Starting from our understanding of these problems, we propose a design with two main approaches to tackling the problems of our users:

- Separation of information into multiple modalities (speech, images, etc) and adaptation of these to specific disabilities;
- Transferring some information processing to simple forms of agents.

## Introduction

Communication between people occurs in many forms: Telephones, letters, newspapers, email, conference systems, MUDs, etc. Each new communication medium develops a culture of its own, which influences everything from the form and speed of communication to the content that is communicated. When a new communication medium is introduced, it does not primarily replace previous media, but rather extends and changes the ways that people can communicate.

However, as the number of different ways of communicating increases, the ability to communicate decreases for those who, for one reason or another, have limited access to these new media. It is thus important to spread the accessibility of the new media to everyone. This is especially true of the disabled, as telecommunication lowers the barriers between disabled and non-disabled. This indicates that if new media are made available to disabled people, their ability to communicate will increase, but that if they are not made available they risk being left out of important channels of information and communication in the society.

MUD environments provide excellent opportunities for several quite different forms of communication between people, such as “chatting”, adventure games, building worlds, etc. (Turkle, 1996). Unfortunately, several groups of disabled users are not able to enter this forum, as the interfaces are not adapted to their needs. The Convene project is an exploratory, problem oriented study of interface problems between MUDs and disabled users, especially youths. In this study we are co-operating with several interest groups for the disabled, such as The Swedish Handicap Institute (HI),

The Swedish National Association for Disabled Children and Young People (RBU), and Unga Synskadade i Stockholm & Gotland (USS; visually impaired youths in the Stockholm/Gotland area).

The project is intended to go through several analysis-design-implementation cycles, iteratively improving the systems and studying the effects of these improvements.

Let us start by providing a short introduction to what MUDs are, and then present our study. Based on our initial results, we have started to outline some design issues for a multimodal environment where different kinds of information are channelled through different media and where simple agents can aid the disabled user to find their way or understand the communication that occurs.

## Study object

What is MUD? In its most general form, it is a virtual environment where multiple users can meet and interact, both with each other and with the environment. Many different types of MUDs exist<sup>1</sup>, and some of the dimensions along which they can be classified are:

- Purpose: Conference environments, talkers (chat environments), games, etc
- Logical output medium<sup>2</sup>: Pure text, pure graphics, mixed mode
- Logical input medium: Keyboard only, pointer device only, mixed mode
- Software engine: Proprietary or shareware; programmable, extensible, or fixed.
- Access method: MUD specific protocol/clients only vs. generic clients, such as Telnet.

The most common type is probably role-playing games using text only, built on top of a programmable shareware MUD engine, and accessible via generic clients.

Our primary reasons for choosing MUDs as the study object is that (1) they encompass a broad spectrum of aspects on communication, and (2) they would seem to provide a good medium for social interaction for people sometimes hindered in that area. Further, the game-oriented aspect means that we get enthusiastic users who continue to use the systems, and that the environment itself provides motivations for interactions.

According to our sources in the handicap organisations<sup>3</sup> there is also a dearth of game environments adapted to users with disabilities in Sweden.

## Study

Our study is serving as a source of inspiration for the design rather than as a formal evaluation of the existing MUD interfaces. So it is part of the first analysis phase of the project.

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<sup>1</sup> For further pointers on the subject, see e.g. <http://www.godlike.com/muds/mres/research.html>

<sup>2</sup> We use the definition of logical media as defined by Bretan (1995).

<sup>3</sup> Personal communication with Sven H Eklöf, RBU.

## Method

As our goal is to find what sorts of problems these user groups experience when using a MUD environment, the first phase is entirely exploratory, using small groups of users that interact freely with the environments. Our focus in the analysis is on the modality used for interaction, the users' communication skills, and their navigation in the MUD world.

In order to study MUD environments, it is necessary to have several users present in the world simultaneously, something that is always a problem when studying CSCW (Computer Supported Co-operative Work) systems. To achieve this we introduced the whole group of users to the tools at the same time, and asked them to be present in the worlds at certain times. The studies were conducted in the subjects' habitual environment, using their own equipment enhanced with Internet-connection and speech synthesis tools, if needed. In each session we singled out one user at a time and video recorded his/her session, both their face and the screen. In addition, we logged user events on the server. After their first session in the system we interviewed each user about their experiences of the tools.

## User groups

At the moment, we have two user groups:

- "slow users", specifically young men with a progressive muscle dystrophy from all over Sweden, and
- visually impaired users, primarily from the Stockholm and Gotland area.

These groups were chosen partly because of availability, partly because of being reasonably homogenous, and partly because their disabilities span the space of modalities. In addition, their disabilities presumably affect the interface design rather than the design of the MUD contents.

## System/Technical environment

Our primary environment is SvenskMUD, a Swedish language LP MUD, (<telnet://svmud.lysator.liu.se>), a pure text game environment, put at our disposal by Lysator, the computer club at the University of Linköping. To access this MUD, we wrote a generic Telnet client of our own, so as to be able to easily incorporate client adaptations. This environment was chosen as it is the only existing Swedish language MUD, and because it represents both the most common type of MUD, as well as one extreme of the spectrum of interaction media. SvenskMUD is a role-playing game, where you move about the world and collaborate with others to accomplish tasks (quests). It also has computer-controlled characters that help or hinder the player.

We are also using a simple Palace environment (<http://www.thepalace.com> for the software, and <palace://tarrega.sics.se:9998> for the MUD site), which is a more graphically oriented MUD. The Palace is primarily a "talker" (chat environment), (see fig. 1) where each channel/room is represented by a picture with clickable "doors" to other rooms and events, and each participant is represented by a superimposed picture (an avatar). The purpose of a Palace MUD is usually purely social or informative. Palace was chosen both because of its bimodality (text in/out, graphics, and direct



**Figure 1: A screen dump from the Palace system.**

An early lesson was that it is not necessarily easy to adapt existing systems, even when they have explicit support for this, such as Palace does. As it turns out, the Palace API only gives access to participant utterances and menus defined by the plugin, not to things such as system messages, name of current room, number of doors in current room, or even who is in the room. This makes it very hard to adapt the system, especially to the visually impaired. We have not yet tested the Palace with the latter group, but predict difficulties for them navigating the environment. However, the manufacturers have shown some interest in improving the API, so it is possible that further adaptations may become feasible in the next cycle.

### **Slow dialogues**

The dialogues in MUD environments are usually fast paced, which limited the ability to communicate for the subjects with motor disabilities. Their disabilities mean that it takes more time for them to type in their responses than for a non-disabled user, which results in them being left out of large parts of conversations, as they cannot respond in time.

Our subjects express a wish to be able to speak to the computer, rather than having to type. Our current system only allows for input via the keyboard.

### **Communication**

The subjects seemed to prefer to congregate with other slow users, rather than to go explore the virtual world, or to find users outside their group. Partly this can be explained by their slow rate of communication. They prefer to talk to other users who are also slow. Another explanation might lie in a secondary social disability, stemming from their not being able to move around freely.

Subjects reported that beyond a certain number of people in the same room, approximately five, it got increasingly difficult to keep track of who was speaking and whom they were addressing.

## Navigation

Subjects did not move around in the world to any great extent. When they did, they only used the direct command “go to room” rather than exploring the world “physically”. Furthermore, as they only logged in as guests, they could not search for each other using proper names, but instead had to decide where to meet beforehand.

The implied navigational problems might not necessarily be due to their disability, but rather be novice behaviour. Once users get more familiarised with the environment, they usually start to explore more of it.

## Design issues

By the end of this year, we plan to have finished the initial result gathering and analysis. From these we will extract the major interface problems, and enter the next design and implementation cycle early next year.

Our current hypothesis, based on our initial study, is that one of the major problems is cognitive overload due to the real-time nature of the communication. Directions for future work are therefore three-fold:

- Reducing information overload by splitting information into multiple output modes and media. For example, textual room descriptions and content could be output via Braille displays, Braille printers, or even regular printers, while conversations are sent to speech synthesis. Another possibility is auditory cues, or entire soundscapes (Macaulay et al. 1997), such as bird song when entering a forest location, a klaxon when a danger is approaching, etc.;
- Reducing cognitive overload by providing alternate input modes/media, or reducing multiple ones, for example by adding speech analysis or eliminating mouse input;
- Reducing cognitive and physical overload by adding adaptivity or personal assistants/agents. For example, handling high level or vague commands, such as “head in an easterly direction”, could be useful to minimise the amount of input necessary to achieve a goal. Another example is to automatically provide shortcuts for frequently used command sequences, especially parameterised ones.

## Summary

Our initial studies show that the pace of communication, to whom subjects decide to talk, and navigation in the world are all areas of particular interest when dealing with disabled users. These results imply that we should devote more attention to how we design the interfaces to the MUD worlds. Our design suggestions therefore concentrate on issues of multimodality and simple agents to aid these user groups.

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