CPSC 319
Team 2

2COMMUNICATE

Dr. Pat Mirenda

Software Design Specification
Document

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2Communicate SDS
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1 Introduction

1.1 System Overview

This SDS will cover the software Autistic Conversational Skills Software or ACSS. This name is simply a developmental project name and in no ways reflects the final marketable name for the product.

ACSS will be a tool to help conversationally-impaired users learn and understand the proper protocol and timing of interrupting conversation. These users are children between ages 6-19 who are autistic or have Asperger’s disorder and have difficulty knowing when to interrupt an ongoing conversation.

ACSS will provide multimedia examples of real conversations in order to illustrate the two main types of legitimate conversation interruption:

i) An appropriate pause in the conversation. The length of this pause will depend on the rate at which the conversation is taking place (rapid, relaxed, moderate, etc.)

ii) An emergency situation in which immediate attention of one or more of the people involved in the conversation. Although emergencies can be relative, the software will focus on examples of emergencies that are universally recognized (e.g. fire, injury, etc.)

ACSS will provide an interface in which a user must indicate when it is appropriate to interrupt the onscreen conversation with regard to either of the situations presented above. Likewise, ACSS must relay back to the user whether or not the chosen moment of interruption was correct or incorrect, along with a reason and or suggestion.

ACSS will provide a statistical history of correct and incorrect choices along with sub-categories of each. ACSS will provide a profile based on these statistics for at least one main user.

ACSS will NOT provide any examples in which the exceptional clause “excuse me” is required or permitted to interrupt a conversation. This clause is beyond the scope and purpose of the software.

The application of ACSS is as learning software as well as possibly being used in research.

ACSS is targeted towards autistic children of age 6-19 with conversational impairments, specifically difficulties in detecting appropriate ways/times to interrupt an ongoing conversation.
The objective of the software is to simulate a real life conversation and to allow the user the ability to “interrupt” the ongoing conversation. The software will then determine whether or not the interruption choice was appropriate or not and why.

The ultimate goal of the software is to improve the ability of the user to determine how and when to interrupt a real-life conversation based on his/her performance with the software. A secondary goal is to allow an observer to monitor the progress of the user based on statistical data gathered by the software. Any inferences, conclusions, and relevant studies made based on this data will be handled independently and the software is not required to make any opinion nor is it responsible for any that are made.

1.2 Supporting Materials

The PowerPoint on Autism given by Dr. Pat Mirenda (the client) is available at http://www.umobileco.com/cs319/project/autismintro.06.HO.ppt

The recorded project description conversation given by Dr. Mirenda is available at http://www.umobileco.com/cs319/clientmeeting-jan24.mp3.

The general team website is located at http://www.umobileco.com/cs319/


1.3 Definitions, Acronyms, and Abbreviations

ACSS – Autistic Conversational Skills Software, the software that this SRS describes, simulating a real life conversation and allowing users to choose when to interrupt the given conversation

SRS – Software Requirements Specification, this document which outlines the requirements that the software must fulfill. Entirely design independent.

InterruptED – The temporary internal developmental name for the ACSS, used for the simplicity of labeling windows/title bars, etc. The completed project will be named according to marketing and research needs.

User – any person who uses the program, with the general case being children ages 6-19 with autism or having Asperger’s disorder who have conversational difficulties.

Administrator – a person who has administrative privilege/access to the system

GUI – graphical user interface

Main Menu Page – the initial menu to allow users to register/login
Game Menu Page – the initial menu for users who have logged in

Registration Page – the page that allows the user to create new accounts

Login Page – the page that allows the user to login if they have a valid login


OS – operating system

SDS – Software Design Specification

RC – Release Candidate

CVS – Concurrent Versioning System

Client – Dr. Pat Mirenda, with possible inclusion of her department and/or research staff.
2 Design Considerations

2.1 Assumptions

It is assumed that the hardware designated for ACSS needs to have a CD-ROM or a DVD-ROM drive for installing the software.

2.2 Constraints

- Platform:
  - must work on Macintosh and PC

- Operating system:
  - for Macintosh: must have OS X.4
  - for PC: must have at least Windows 98 or above

- Hardware:
  - the computer must have an audio output system and speakers or headphones
  - at least 128 MB of RAM
  - minimum 800x600 screen resolution with 256 colors

2.3 System Environment

The system runs a Java Virtual Machine to provide the ACSS to service on any operating system with Java installed, along with Java Media Framework. A XML database will reside on the system to store user and game information.

There is no specific hardware requirement for the system, other than the assumptions made in section 2.1 and the constraints made in section 2.2.
Figure 3.1.1 An Architectural View of the ACSS System
3.1 Overview

The system will follow the three-tier architectural style and be organized into three layers: the interface layer, application layer and the storage layer. The interface layer will be the graphical user interface that allows the users to interact with the system. It will be implemented using the Java Media Framework and the Java Swing Package, and will contain the video player and all menus. The application layer will contain the logic and rules for storing data in the database layer and also retrieving it in accordance with the user’s needs. This is the layer that will contain the data file parsers and will allow controlled access to the data files. Finally, the storage layer will store the metadata required for the system.

3.2 Rationale

The three-tier architecture style shall be used because it not only separates the user interface and the metadata, but also provides an application logic layer. The application layer provides a middle layer that allows the data files and the GUI components to be loosely coupled. The application layer has to be modified if there are any changes to the format of the data files and the interface layer will need little or no modification. This will make it easy for clients of this software to modify the data file format and attributes for further research purposes if they wish to do so. This layer makes the system more maintainable and reusable and also hides the complexity of processing data from the users.
4 High Level Design

4.1 Conceptual View

Fig 4.1.1 The Conceptual Diagram for the ACSS System
4.2 Physical View

Fig 4.2.1 The Deployment Diagram for the ACSS System
5 Low Level Design

5.1 Module

Fig 5.1.1  The Game Subsystem Diagram

Fig 5.1.2 (Next Page)  The State Diagram
Fig 5.1.3 The Storage Subsystem Class Diagram
Fig 5.1.4 The User Interface Subsystem Class Diagram
Fig 5.1.5 The User Subsystem Class Diagram
5.2 Sequence Diagrams

5.2.1 Accounts System

5.2.1.1 The system should allow users to login

- **Case 1: Login Succeeded**
  - UserName is in the database, and the userName and password pair matches.
  - User is granted access.

- **Case 2: Login Failed**
  - UserName is not in the database, or the userName and password pair does not match.

- **Case 3: Login Reset**
  - User presses "clear" to reset the login process.

- **Case 4: Login Aborted**
  - User presses "cancel" to cancel the login process.
5.2.1.2 The system should allow users to logout

Case 1: Logout Succeed
User presses logout and press "Yes" when the confirmation message pops out.

Case 2: Logout Aborted
User presses logout and press "No" when the confirmation message pops out.
5.2.1.3 The system should allow users to register an account

User

"register" button is pressed

Register GUl

Case 1: Register Successful
User ID and password are both valid.

Register GUl is displayed

UserName, and Password are entered, and "ok" is pressed

CheckUser(UserName, Password)

UserAccount(UserName, Password, age)

new user has been created

Register Account

Case 2: Register Failed
User ID is existed or the format of User ID or password is not valid or empty.

Register GUl is displayed

UserName, and Password are entered, and "ok" is pressed

Register Failed

CheckUser(UserName, Password)

Register GUl

Register Account

Case 3: Register Aborted
User has pressed the cancel button to abort the registration process.

Register GUl is displayed

"cancel" is pressed

Register Aborted

Register GUl
5.2.1.4 The system should allow the administrator to delete user account

Case 1: Delete Succeeded
The game/level file is a valid file.

Case 2: Delete Failed
The game/level file is not a valid file.
The appropriate error message is displayed on the screen.
5.2.2 Game System

5.2.2.1 The system shall allow the user to play the game
5.2.2.2 The system shall allow the user to exit the game at any point

Case 1: Quit Succeed
Users choose "yes" to quit the game. The game GUI closes up. User is redirected to the previous menu.

Case 2: Quit Succeed
Users choose "no" to cancel the quitting process.
5.2.3 Training System

5.2.3.1 The system should allow the user to practice playing the game

- Case 1: PracticePlay Succeed
  - The selected Video is a valid file.

- Case 2: PracticePlay Failed
  - The selected Video is either corrupted or not existed.
  - Exception caught while setting up the video player.
5.2.3.2 The system should allow the user to view and play the tutorial

5.2.3.3 The system should allow the user to exit the training system at any time
5.2.4 User Data System

5.2.4.1 The system may allow the user to view their performance history
5.2.4.2 The system may allow the administrator to erase user records

Case 1: Erase Succeed
The selected User has a valid score record.

Case 2: Erase Failed
The select user does not have a valid score record. "No History" is displayed on the screen.
5.2.4.3 The system may allow the user to modify their game setting

Case 1: Modify Key Map

- Settings GUI is displayed
- "keymap" button is pressed
- KeyMap GUI is displayed
- Key map has been modified
- Settings has been updated successfully

5.2.4.4 The system may allow the user to choose a reward

Case 1: RewardPlay Succeed
The selected Reward is a valid file.

- Game GUI is displayed
- "mediaURL" is selected
- VideoCheck(mediaURL)
- VideoPlay Succeed
- select a reward from the menu
- VideoCheck(rewardURL)
- PlayReward Succeed
- startPlayer()
6 User Interface Design

6.1 Application Control

Common Look & Feel
All windows will be Java/Swing style windows. These windows will have no additional toolbars or buttons except for the minimize, maximize, and close buttons found in all application windows.

The window appearance on any given system may change depending on the current system desktop theme and operating system (i.e. OS X.4 or Windows).

Minimum Requirements
The user must be running either Macintosh OS X.4 or Windows 98 or higher. Users will be required to use a minimum screen resolution of 800 x 600.

6.2 Screenshots
Fig. 6.2.1 The Main Menu

Please enter your user name and password

User name
Password

LOG IN  CANCEL

Fig 6.2.3 Login Menu
Fig 6.2.4 Tutorial

Pressing INTERRUPT button/key NOW would be BAD!
Press Space to continue...

Bad interruption!
Fig 6.2.5 Game Menu
Fig. 6.2.6 Practice
Please select your game:

default easy

PLAY  CANCEL
Fig. 6.2.8 Game Screenshots
Fig. 6.2.9 Interrupt
Fig. 6.2.10 Choose Reward
Fig 6.2.11 Reward
Fig 6.2.12 Score Review Menu
Fig. 6.2.13 Score Review for Current Game
Fig. 6.2.14 Score Review for All Games
Fig. 6.2.15 Settings
Fig. 6.2.17 Keyboard Mapping Menu
Please enter your new password

Old password:

New password:

Re-enter password:

OK
CANCEL

Fig. 6.2.18 Password Change
Fig. 6.2.19 Remove User
Fig. 6.2.20 Advanced Settings Menu
Fig. 6.2.21 Add Video
Fig. 6.2.22 Remove Video
Fig. 6.2.23 Add Game
Fig. 6.2.24 Save Game
Fig. 6.2.24 Remove Game