User Manual for Simulator

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Abstract:
This document summarizes system requirement and steps to run the simulator. It describes steps to run each of the visual, hearing and motor impairment simulator for basic and a couple of advanced operations.

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1 System requirement

System requirement: Windows 2000/ XP / 7 / Vista

Processor: Any processor running at GHz range

Known problem: The visual and hearing impairment simulator may take 60 to 120 seconds to simulate effect of severe visual impairment.

2 Contents of the folder

- **Dependencies:** Contains all the library files required for the simulator. Some or all of them may need to be registered based on the particular version of the operating system. Please refer to instructions below.
- **Executables:** Contains the executable files.
- **Profiles:** Contains five sample user profiles.
- **Screenshots&Audio:** Contains sample screenshots, layout definitions and audio files.
- **SimulationExamples:** Contains sample output from the simulator.
- **User Manual.**pdf: The present document, please read it first before running the simulator.

3 Instruction to use the simulator

The simulator is designed as a tool to help designers in visualizing, understanding and measuring effect of age and impairment on their designs. The software runs on a Windows XP or Windows 7 operating system. ***You may need to manually register one or more library files depending on your machine configuration. Please run the SetUp.bat file in the Dependencies Folder.***

- **Run the Simulator.exe file in Executables Folder**

3.1 Instructions to run the Visual Impairment Simulator

3.1.1 Quick start

1. Click on Visual Impairment Simulator
2. Select a level of Blurred Vision and presence of Colour Blindness using the checkboxes and option buttons.
3. The slider will show you the percentage of samples you have covered.
4. Now Click on the 'Demonstrate Simulation' button at the bottom right corner.
5. Select an image file in the folder 'GUIDEScreenshots'. *You can also store any screenshot of your application as a 24bit Bitmap (.bmp) file at 1280 $\times$ 800 resolution and simulate effect of impairment on it.*
6. Wait until the image appears in the screen.
7. Double Click at any point on the image.
8. The simulation will show you the perception of the visually impaired user.

3.1.2 Loading user profile

1. Click on 'Load User Profile' button on bottom left.
2. Select an xml file in the folder 'Profiles'.
3. It will load profile of a sample user stored in the xml file.
4. Now Click on the 'Demonstrate Simulation' button at the bottom right corner.
5. Select an image file in the folder 'GUIDEScreenshots'. You can also store any screenshot of your application as a 24bit Bitmap (.bmp) file at 1280 × 800 resolution and simulate effect of impairment on it.
6. Wait until the image appears in the screen.
7. Double Click at any point on the image.
8. The simulation will show you the perception of the visually impaired user.

3.1.3 Changing visual parameters

1. Select the tab 'Subjective Assessment' and change the level of severity using the slider, (Try to be within the quarter of the full range otherwise it may take long to run the simulator if the machine is slow).
2. Select the second Tab labeled 'Visual Parameters'.
3. In this tab, you can change the level of visual parameters of the user.
4. Select the third tab, labeled as 'Image Parameters'
5. In this tab you can see the effect of visual impairment in terms of image processing algorithms and run different image processing algorithms to manually simulate the effect of impairment.
6. Now Click on the 'Demonstrate Simulation' button at the bottom right corner.
7. Select an image file in the folder 'GUIDEScreenshots'. You can also store any screenshot of your application as a 24bit Bitmap (.bmp) file at 1280 × 800 resolution and simulate effect of impairment on it.
8. Wait until the image appears in the screen.
9. Double Click at any point on the image.
10. The simulation will show you the perception of the visually impaired user.

3.2 Instructions to run the Hearing Impairment Simulator

3.2.1 Quick start

1. Select Hearing Impairment Simulator
2. Select a type of hearing impairment and change the level of severity using the slider.
3. Now Click on the 'Demonstrate Simulation' button at the bottom right corner.
4. Select a sound file in the folder 'GUIDEScreenshots'. *You can also store any audio file of your application as a 16bit PCM encoded, 44.1 kHz .wav file (standard format)*.
5. Wait until the simulation completed.
6. The simulation will play the perception of the hearing impaired user.

3.2.2 Loading user profile

1. Click on load button on bottom left.
2. Select an xml file in the folder 'Profiles'.
3. It will load profile of a sample user stored in the xml file.
4. Now Click on the 'Demonstrate Simulation' button at the bottom right corner.
5. Select a sound file in the folder 'GUIDEScreenshots'. You can also store any audio file of your application as a 16bit PCM encoded, 44.1 kHz .wav file (standard format).
6. Wait until the simulation completed.
7. The simulation will play the perception of the hearing impaired user.

3.2.3 Frequency attenuation

1. Select Customized Frequency Attenuation option on the first tab.
2. Goto the third tab labeled Audio Processing.
3. Choose a frequency band, attenuation levels at left and right ear.
4. Now Click on the 'Demonstrate Simulation' button at the bottom right corner.
5. Select a sound file in the folder 'GUIDEScreenshots'. You can also store any audio file of your application as a 16bit PCM encoded, 44.1 kHz .wav file (standard format).
6. Wait until the simulation completed.
7. The simulation will play the perception of the hearing impaired user.

3.3 Instructions to run the Mobility Impairment Simulator

3.3.1 Basic operations

1. Select the Motor Impairment Simulator
2. Select a level of Motor Impairment, the slider will show you the percentage of samples you cover.
3. Select an input device and any combination of adaptation algorithms.
4. Now Click on the Demonstration button at the bottom right corner.
5. Select an image file in the folder 'GUIDEScreenshots'. *You can also store any screenshot of your application as a 24bit Bitmap (.bmp) file at 1280 × 800 resolution and simulate effect of impairment on it. However you have to manually store the locations of objects in the image in .xml or .txt format following the existing layout files.*
6. In case you do not have the layout definition ready, you can create one by pressing the 'Create Interface Layout' button and following the steps. It will create a text file with the same name of the image file of the interface.
7. Select the appropriate layout for that image, the layout has the same index number as the image in the 'GUIDEScreenshots' folder (*5*Interface.xml or *5*layout.txt for *5*.bmp).
8. Wait until the image appears in the screen.
9. Double click at any button on the image.
10. The simulation will show you the cursor trace and approximate movement time up to that point from the centre of the screen.

3.3.2 Loading user profile

1. Select the tab 'Subjective Assessment', it allows you to control severity of three different diseases for different devices.
2. Select a disease and change the level of severity using the slider.
3. Select the second Tab labeled 'Hand Functions'.
4. In this tab, you can change the level of hand functions of the user.
5. Select the third tab, labeled as 'Demography'
6. In this tab you can select the age, sex and height of the user.
7. If you change anything at the 'Demography' tab, do take a look at the 'Hand Function' tab, as the hand metrics will change according to the age, sex and height of user.
8. Select an input device and any combination of adaptation algorithms.
9. Now Click on the Demonstration button at the bottom right corner.
10. Select an image file in the folder 'GUIDEScreenshots'. *You can also store any screenshot of your application as a 24bit Bitmap (.bmp) file at 1280 × 800 resolution and simulate effect of impairment on it. However you have to manually store the locations of objects in the image in .xml or .txt format following the existing layout files.*
11. Select the appropriate layout for that image, the layout has the same index number as the image in the 'GUIDEScreenshots' folder.

12. Wait until the image appears in the screen.
13. Double click at any button on the image.
14. The simulation will show you the cursor trace and approximate movement time up to that point from the centre of the screen.

3.3.3 Changing motor impairment parameters

1. Click on 'Load User Profile' button on bottom left.
2. Select an xml file in the folder 'Profiles'.
3. It will load profile of a sample user stored in the xml file.
4. Select an input device and any combination of adaptation algorithms.
5. Now Click on the Demonstration button at the bottom right corner.
6. Select an image file in the folder 'GUIDEScreenshots'. *You can also store any screenshot of your application as a 24bit Bitmap (.bmp) file at 1280 × 800 resolution and simulate effect of impairment on it. However you have to manually store the locations of objects in the image in .xml or .txt format following the existing layout files.*
7. Select the appropriate layout for that image, the layout has the same index number as the image in the 'GUIDEScreenshots' folder.
8. Wait until the image appears in the screen.
9. Double click at any button on the image.
10. The simulation will show you the cursor trace and approximate movement time up to that point from the centre of the screen.
11. Now you can repeat steps 4 to 14 on this particular user.

4 Features available in full version

- Running visual, hearing and motor impairment simulation in batch mode – running the system through a series of interfaces of an application by writing a script.
- A cognitive simulator can be used to simulate effects of a few cognitive impairment.
- Prediction points of eye gaze fixation and eye movement patterns in the visual impairment simulator.

5 Contact detail

Please provide feedback and suggestions to

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