Final Presentation
Software Game to Improve Speed & Accuracy of Name Recall
Sponsor: Ohio University

Design Team 8:
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Alanna Ocampo – Bioinformatics

BME 4900
December 2009
A software memory recall game will be designed for people with Alzheimer’s Disease, dementia, or others who suffer from memory loss due to advanced age.

Overview of presentation:
- Background
- Project Objective
- Patents/Pre-existing Products
- Final Design
- Budget
- Timeline
Main cognitive deficits of clients:

- *Short-term memory loss of names and faces of loved ones and friends; causes frustration and embarrassment*
- Loss of basic faculties, disorientation
- Causes of Alzheimer’s Disease/dementia: deposition of beta-amyloid plaque, which interferes with communication between brain cells, entanglement of an essential neuronal protein called tau—damaged neurons

Why design a memory recall game?

- Speech pathologist recommended repeated use of images to improve memory recall
- Studies support this assessment ("Improvement of Picture Recall by Repetition in Patients with Dementia of Alzheimer Type" in the *International Journal of Geriatric Psychiatry*, volume 12)
Objective

- A software memory recall game will be designed for people with Alzheimer’s Disease, dementia, or others who suffer from memory loss due to advanced age.

- **Client Specifications:**
  - Game must be installable on a PC – Microsoft Windows with Vista
  - Must accept digital images and names, specific for each user
  - Must supply a default package of images of celebrities and political figures, relevant to elderly people
  - Must be able to select different lists of names to be worked on in different sets
  - Must prompt the user to say a name into a microphone once the image is presented
  - Must keep score and time
  - Respond to correct or incorrect answers with auditory and visual feedback.
  - Software used for voice recognition must be supplied, along with the microphone
Some pre-existing memory game products:

- Several computer memory games exist, with various capabilities and prices
- Ex: Memory Magic for kids by Mercury Learning Systems LLC ($50) & Sharper Brain & Sharper Memory for people with ADD and ADHD by Division of Advanced Cognitive Enhancement ($740), Wii and Nintendo DS word games ($50)

Problems:

DO NOT meet specifications!

- In general, memory games on the market are not customizable for adding personal images
- Do not have voice recognition answer input
- Games do not focus on facial recognition, but are path, sequence or puzzle memory games.

Proposed Design:

Meets specifications!

- Customizable for personal images
- Simple interface for elderly people
- Voice recognition answer input
- Game will focus on facial recognition

Reasonable marketing price!

- At 35% of prototype cost, can market game at ~$126
Related patents:

Problems:
- DOES NOT meet specifications!
  - Not a memory software game
  - Does not focus on face recognition
  - No voice input

Figure 4: 2008/01387783

Figure 5: 2005/0203430
This software will be programmed in C# using the .net framework in the Microsoft Visual Studio environment.

.net framework provides voice recognition libraries to use in applications.

Figure X below is the UML diagram which describes the outline of the classes used to implement this program.

Figure X: UML diagram
Budget

Software Game (Ohio University)

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Speech Ware Microphone</td>
<td>$250.00</td>
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<tr>
<td>Total Product Cost:</td>
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<tr>
<td>Shipping &amp; Extra:</td>
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<td>Grand Total:</td>
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Total Cost For Team 8 Projects: $1,641.00
<table>
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<th>Time Period</th>
<th>Task</th>
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<tbody>
<tr>
<td>11/30-12/14</td>
<td>-Order microphone</td>
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<tr>
<td>12/28-1/4</td>
<td>-Work on Profile, Person, ProfileLib classes</td>
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<tr>
<td>12/28-1/4</td>
<td>-Work on PhotoLib, SaveFile, &amp; StatisticsHandler classes</td>
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<tr>
<td>1/4-1/18</td>
<td>-Work on SpeechHandler class</td>
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<tr>
<td>1/18-1/25</td>
<td>-Work on PersonEditorForm, AboutForm, UserSessionForm &amp; PhotoEditor Form classes</td>
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<tr>
<td>1/25-end</td>
<td>-Work on main form class, debugging, and testing</td>
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Acknowledgments

- Dr. John Enderle
- Mr. James Paolino
- Ohio University