Smart Mirror
An interactive touch-free mirror that maximizes time efficiency and productivity

Senior Design I – Group 10

Initial Project Document
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Project Description:
Effective time management is the key to success in both professional and personal matters. It is very common nowadays for people to be disorganized and inefficient especially during mornings and hence our "Smart Mirror" project is designed to tackle this problem. Beginning the day with a purpose and a plan increases the chances of success. As a result, smart mirror will be installed in a bathroom since this is the place where people start their daily routine. The objective of our project is to maximize productivity by incorporating many essential applications in our design. Touch-less controls allow the user to interact with different applications such as email, to-do list, news, and weather. The mirror also provides big database of clothing. Additionally, the voice recognition feature enables the user to implement different functions such as turning on/off the mirror and playing music. Controllable lights and facial magnification features help create a better mirror experience.

Sponsors:
There are currently none, but reaching out to several companies including SoarTech, Microsoft, and Texas Instruments.

Specifications and Requirements:
- 32” Diagonal Display (Positioned vertically)
  - Contains GUI for user
  - Doesn’t completely block the mirror
- “Leap Motion” touch-less control
  - 8 Cubic Meter area of recognition
  - Reads up to 10 fingers
- Bathroom temperature
  - Monitors Humidity using sensor
  - Recommends use of bathroom fan
- Adjustable mirror lighting
  - Adjustable brightness
  - Light strip on each side of mirror
- Speakers
  - Play notification sounds
  - Play music
- Apps on Mirror
  - Weather
  - Email (Read only)
  - News
  - Music
  - To-do/Schedule (Read Only)
  - Clock/Timer
- Auto-on and auto-off via webcam
  - Recognizes user standing in front of mirror
  - Shuts off after 2-minutes of no user present
• Outfit collection via webcam
  o Stores favorite outfits of user
  o Can display outfit side-by-side on mirror with user
• Mirror magnification via webcam
  o Up to 10x Zoom
  o Provide facial detail to user
• Voice Control
  o Up to 15 feet away
  o Control whether mirror stays on or off
  o Control music app
  o Control timer app

Block Diagrams:

Figure 1: System Block Diagram
Figure 2: Software Block Diagram
Project Budget:

<table>
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<tr>
<th>Item</th>
<th>Price</th>
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<tbody>
<tr>
<td>32” LED HDTV</td>
<td>$300</td>
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<td>Microcontroller</td>
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<td>Leap Motion Controller</td>
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<td>Speakers</td>
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<td>Custom PC</td>
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<td>Vanity Lights</td>
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<td>Mirror/Lighting Housing</td>
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<td>PCB Manufacturing</td>
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Financed by potential sponsors and group members

Project Milestones:

Legend:
Research = Green
Design = Blue
Prototyping = Orange
Testing = Yellow