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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Georgiy Brussenskiy Christopher Chiarella Vishal Nagda

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
  - Stores favorite outfits of user
  - Can display outfit side-by-side on mirror with user
- Mirror magnification via webcam
  - Up to 10x Zoom
  - Provide facial detail to user
- Voice Control
  - Up to 15 feet away
  - Control whether mirror stays on or off
  - Control music app
  - Control timer app

Block Diagrams:

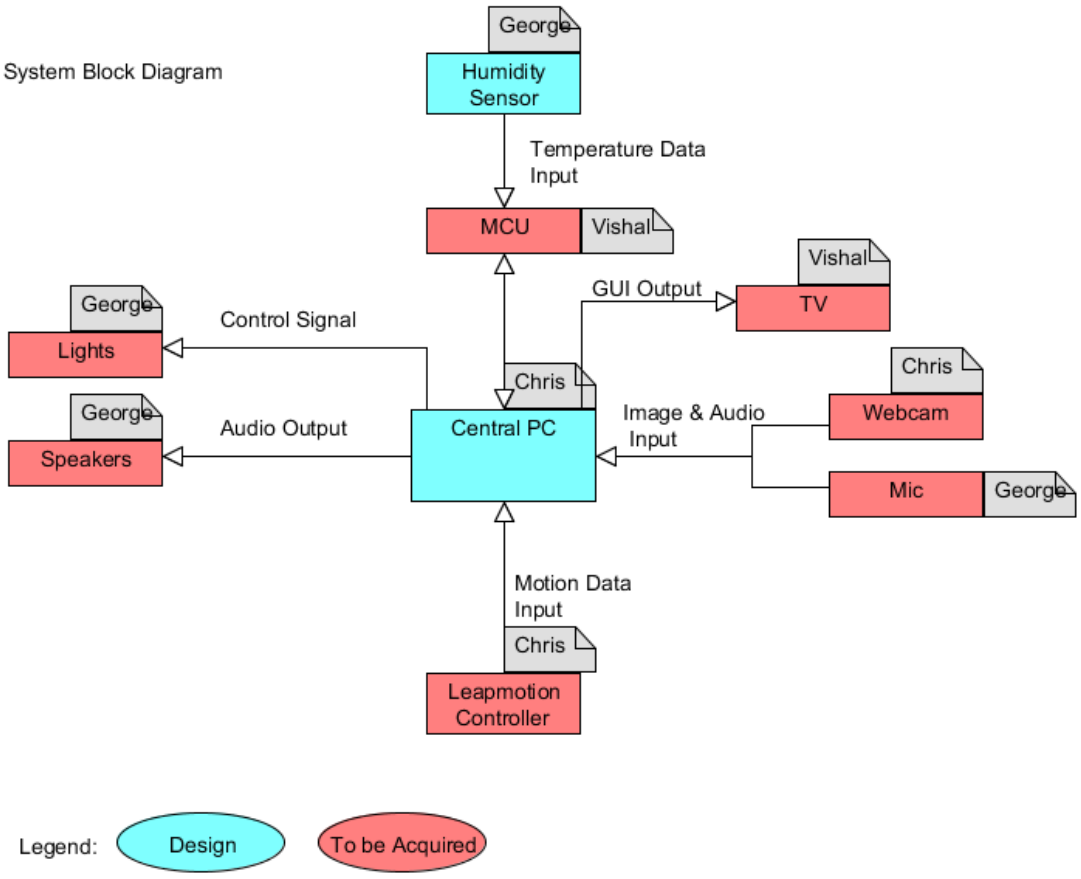


Figure 1: System Block Diagram

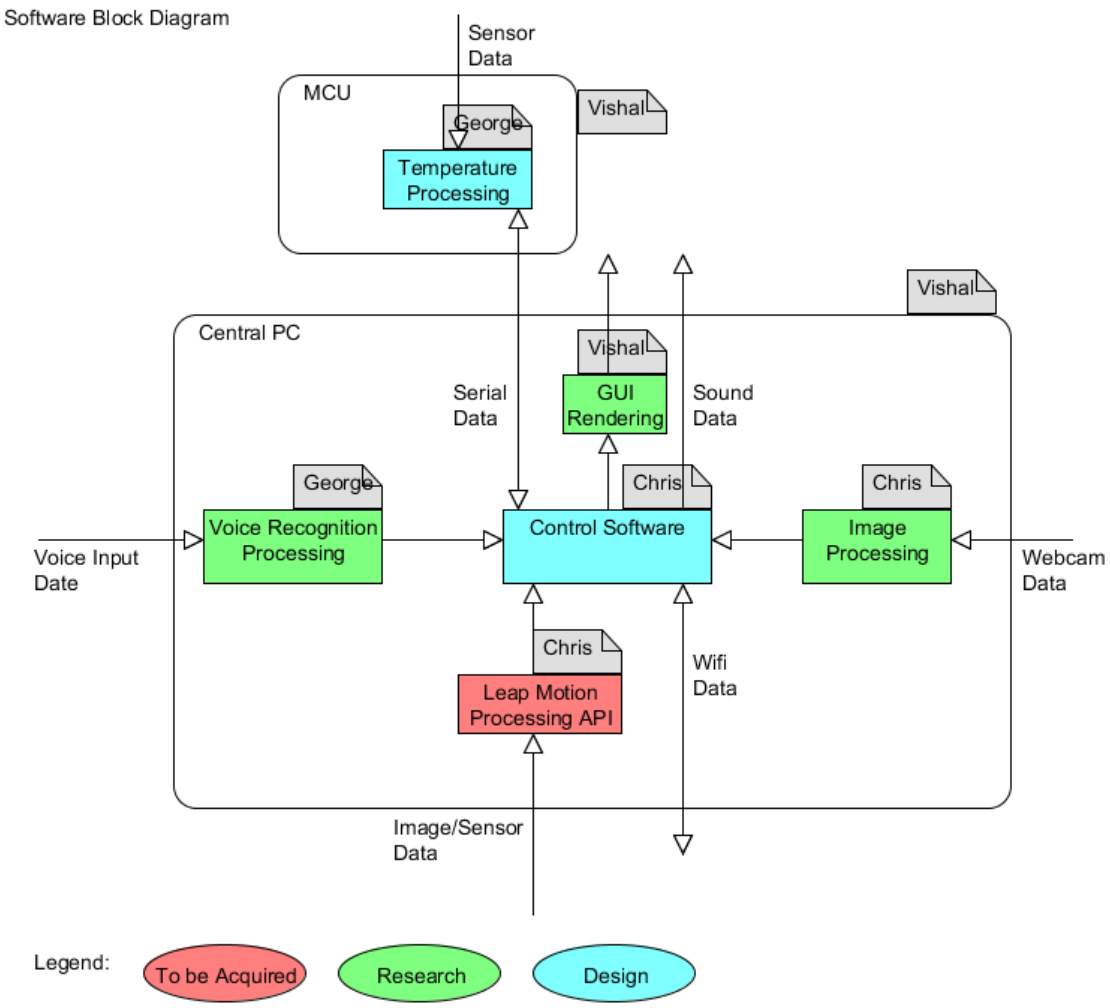


Figure 2: Software Block Diagram

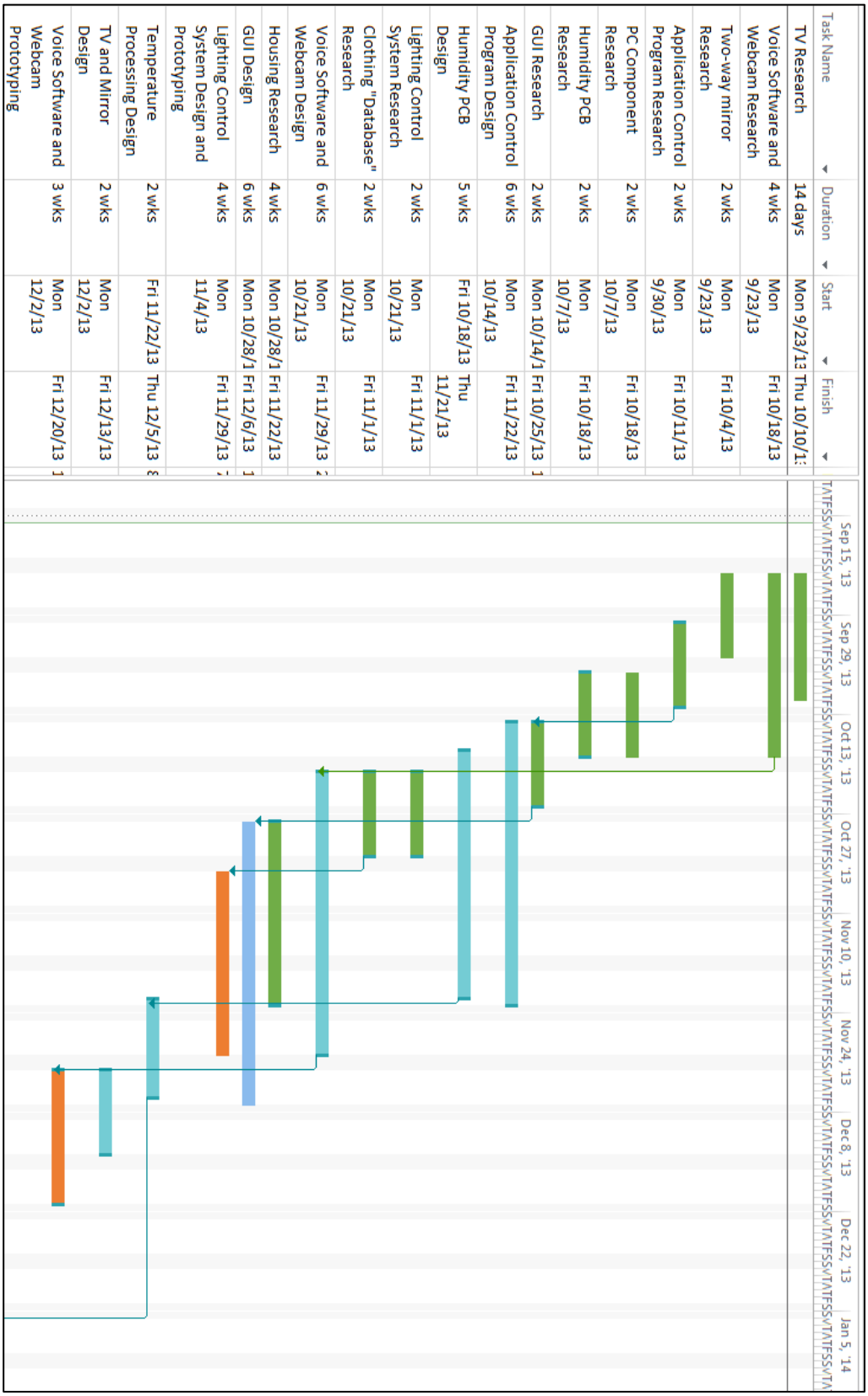
Project Budget:

	Item		Price
	32” LED HDTV		$300
	Microcontroller		$20
	Leap Motion Controller		$90
	Speakers		$25
	Custom PC		$500
	Webcam		$80
	Two-Way Mirror		$100
	Humidity Sensor		$30
	Vanity Lights		$50
	Mirror/Lighting Housing		$100
	PCB Manufacturing		$100
	Document Printing		$50
	Total:		$1445

Financed by potential sponsors and group members

Project Milestones:

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



Task Name	Duration	Start	Finish
TV Research	14 days	Mon 9/23/13	Thu 10/10/1:
Voice Software and Webcam Research	4 wks	Mon 9/23/13	Fri 10/18/13
Two-way mirror Research	2 wks	Mon 9/23/13	Fri 10/4/13
Application Control Program Research	2 wks	Mon 9/30/13	Fri 10/11/13
PC Component Research	2 wks	Mon 10/7/13	Fri 10/18/13
Humidity PCB Research	2 wks	Mon 10/7/13	Fri 10/18/13
GUI Research	2 wks	Mon 10/14/1	Fri 10/25/13
Application Control Program Design	6 wks	Mon 10/14/13	Fri 11/22/13
Humidity PCB Design	5 wks	Fri 10/18/13	Thu 11/21/13
Lighting Control System Research	2 wks	Mon 10/21/13	Fri 11/1/13
Clothing "Database" Research	2 wks	Mon 10/21/13	Fri 11/1/13
Voice Software and Webcam Design	6 wks	Mon 10/21/13	Fri 11/29/13
Housing Research	4 wks	Mon 10/28/1	Fri 11/22/13
GUI Design	6 wks	Mon 10/28/1	Fri 12/6/13
Lighting Control System Design and Prototyping	4 wks	Mon 11/4/13	Fri 11/29/13
Temperature Processing Design	2 wks	Fri 11/22/13	Thu 12/5/13
TV and Mirror Design	2 wks	Mon 12/2/13	Fri 12/13/13
Voice Software and Webcam Prototyping	3 wks	Mon 12/2/13	Fri 12/20/13

Figure 3: Senior Design I

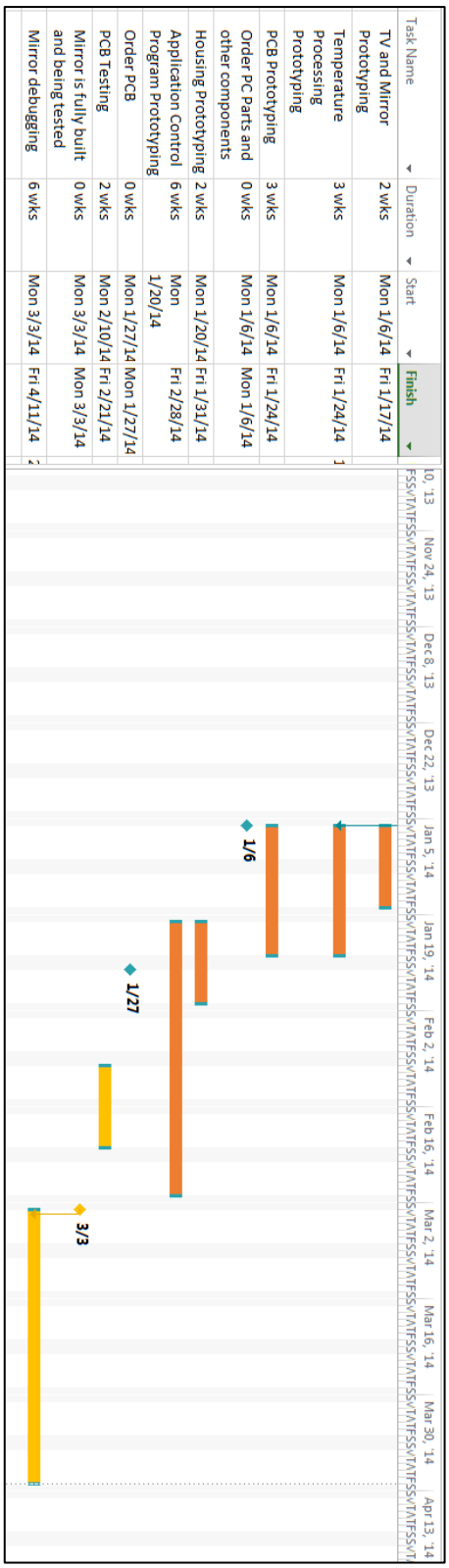


Figure 4: Senior Design II