Design Notebook

Rahul Balamurali

ECE 4873: Team Smart Look

Advisor: Dr. Linda Wills

Teammates:

Tara Poteat

Madeline Loui

Jake Webb

Caleb Alexander

ENGINEERING NOTEBOOK

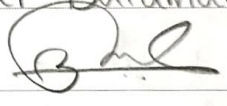
NOTEBOOK

NOTEBOOK NO.

CONTINUED FROM NOTEBOOK NO. CONTINUED TO NOTEBOOK NO.

ASSIGNED TO:

NAME Rahul Balamurali

SIGNATURE  DATE

DATE ISSUED BY

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COMPANY

DEPARTMENT

ADDRESS

CITY STATE ZIP

DATE NOTEBOOK COMPLETED NUMBER OF PAGES FILLED IN

NOTES:

GUIDELINES†

INTRODUCTION

Using a Notebook to record ideas, inventions, experimentation records, observations and all work details is a vital part of any laboratory process. Careful attention to how you keep your Notebook can have a positive impact on the patent outcome of a pending discovery or invention.

Following are some overall recommendations to help you keep more efficient and accurate Notebook entries. Remember, however, that these are simply a suggested set of guidelines. Only your attorney can supply the exact guidelines she would like you to follow to satisfy specific legal requirements. That is why we recommend that you consult your legal counsel.

RECORDING DATA

Your Notebook is a vital record of your work whether it is for patent purposes, legal records or documenting drug research under FDA guidelines. The Notebook can help you prove:

a. Exact details and dates of conception
b. Details and dates of reduction to practice
c. Diligence in reducing your invention to practice
d. Details regarding the structure and operation of your invention
e. Experimentation observations and results
f. A chronological record of your work
g. Other work details

Follow a few simple rules of thumb

1. Always record entries legibly, neatly and in permanent ink.
2. Immediately enter into your notebook and date all original concepts, data and observations, using separate headings to differentiate each.
3. Record all concepts, results, references and other information in a systematic and orderly manner. (Language, charts and numbering systems should be maintained consistently throughout.)
4. It is acceptable to make your entries brief. Always, however, include enough details for someone else to successfully duplicate the work you have recorded.
5. Label all figures and calculations.
6. Never, under any circumstances, remove pages from your notebook.

Remember to treat your Notebook as a legal document: It records the chronological history of your activities. The following guidelines should help you maintain the consistent and accurate entries needed for future legal purposes.

1. Start entries at the top of the first page, and always make successive, dated entries, working your way to the bottom of the last page.
2. After completing a page, sign it before continuing to the next page.
3. Make sure that you record the date of each entry clearly and unambiguously.
4. Never let anyone other than yourself write in your Notebook (excluding witness signatures, discussed later).
5. Never leave blank spaces, and never erase or remove material you have added. Simply draw lines through any blank spaces at the same time you are making your entries.
6. Do not erase errors. Just draw a single line through any erroneous entry, then add your initials. Enter the correct entry nearby.
7. You can supplement your entries with supporting material (e.g., test-result printouts and other documentation). But you must permanently affix the material onto a page in its proper chronological location.
8. Never rely solely on any supplemental attachment. Always include your own entry describing the attachment and add any conclusions that you might draw from its substance.
9. Occasionally, secondary sources might be too large or inappropriate to attach directly to your notebook. In this case, you can add all secondary sources to an ancillary record maintained precisely for this purpose. However, always remember to write a description of these secondary sources, clearly and unambiguously, in your notebook.

DOCUMENTING PATENT ACTIVITIES

A primary purpose of a Notebook is the support of documenting work that may be patentable. To support patent activities, it is necessary to provide clear, concise, chronological entries with specific dates. To rely on these dates, you must have at least one non-inventor corroborate that the events actually happened and that he or she understood your invention by signing and dating the "Disclosed to and Understood by" signature blocks.

Your Notebook should help you document and prove:

1. *Conception Date*—The date that you knew your invention would solve the problem.
2. *Date of reduction to practice*—The moment that you made a working embodiment of your invention.
3. *Diligence in reducing your invention to practice*—Diligence refers to your intent and conscious effort to make a working embodiment. You are not required to rush, or even to take the most efficient development strategy. But your Notebook must include details relating to your diligent activities. These are dates and facts that show what activities you have conducted to reduce the invention to practice, and when such activities were conducted. Since you may still be diligent despite periods of not working on reducing your invention to practice, always remember to provide reasonable excuses for these periods of inactivity by supplying facts relating to why there was no activity during the period in question. (e.g., unavailability of test conditions or equipment).
4. *How to make and use your invention*—provide documentation details sufficient to teach a colleague how to make and use your invention.
5. *The best mode of practicing your invention*—document the best way to practice your invention.

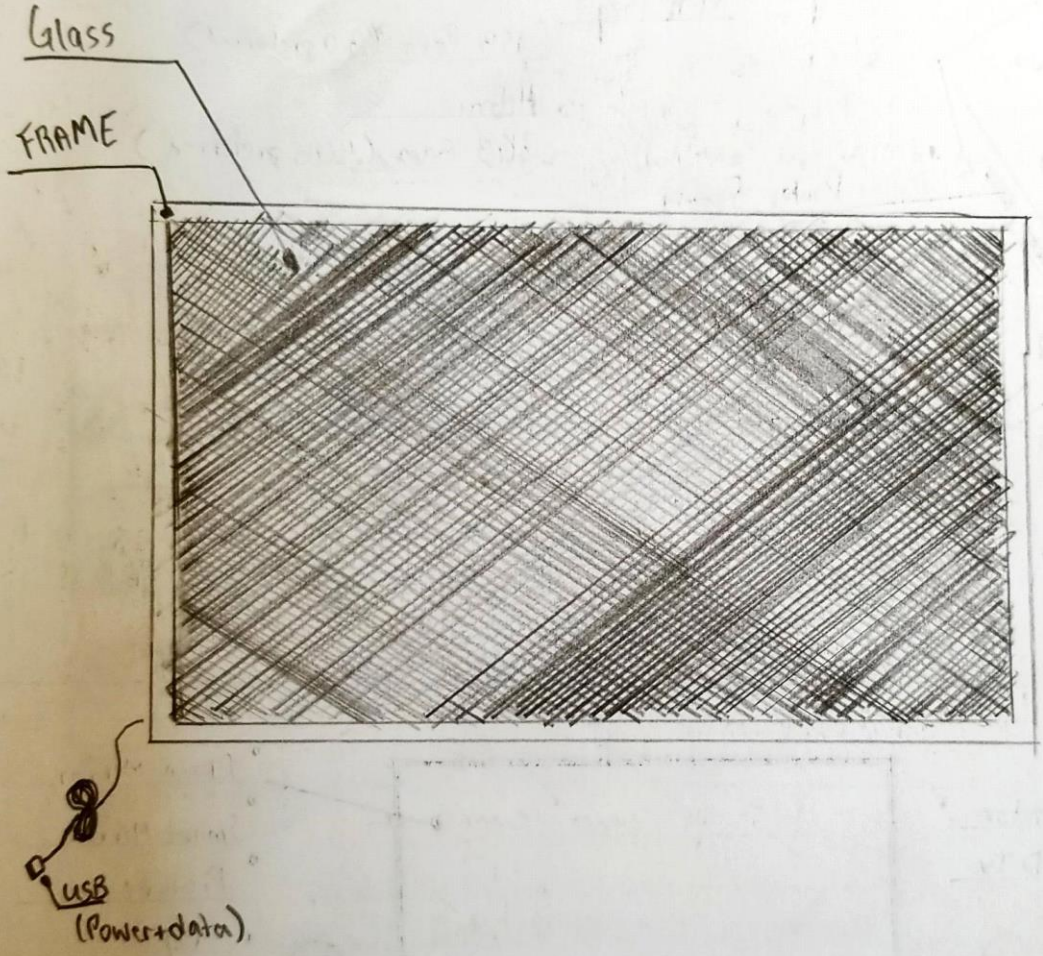
A non-inventor colleague should corroborate each of these events/facts by signing the "Disclosed to and Understood by" on the relevant pages.

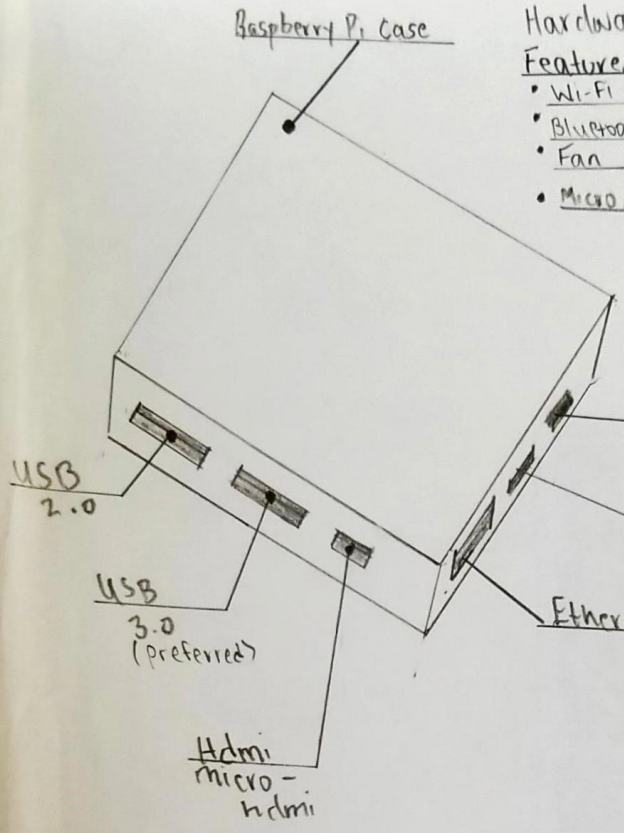
† BookFactory provides these sample guidelines "AS IS" without warranty.

IR Touch Frames

Array of XY Infrared LED/Photodetector pairs.

Company: ProDisplay
Electronic Play House.





Hardware Features

- Wi-Fi
- Bluetooth
- Fan

option 1: built-in
option 2: adapters

- Micro SD

Min. Req.

USB Port (3.0 preferred)

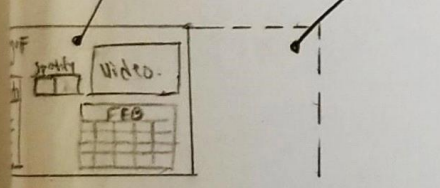
Hdmi

2GB Ram (4Gb preferred)

Software Feature

- custom Layout: Rainmeter.
- Bluetooth Sys connection
- " Media "
- Touch Screen - IR Panel.

1

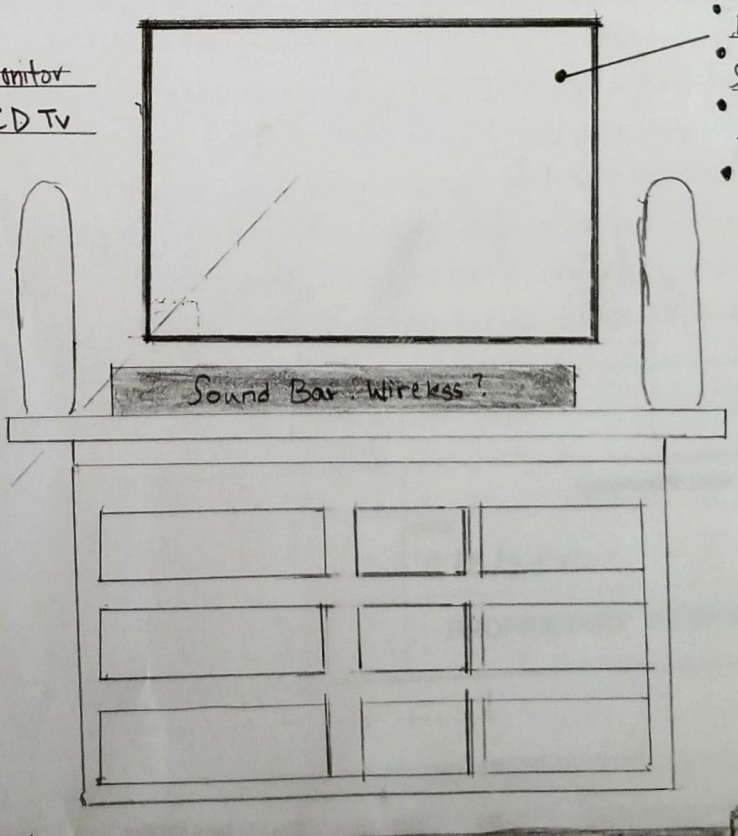


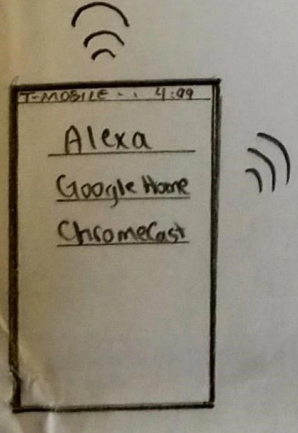
2

Monitor

LCD Tv

- Plain Mirror
- Smart Mirror
- Picture
- Tv





~180° viewing angle

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Meeting Minutes Notes : Meeting 1 2/5/2020

Team Members: Tara Poteat
Madeline Lowi
Hari Tiwari
Me
} ALL CMPE
GroupME formed.

① Discuss roles:
Me: Team Lead / coordinator / Hardware Lead
Tara: Communication
Madi: Software

My Role: Be aware of due dates, coordinate, make sure to turn in stuff on time, Hardware Stuff

② Discuss potential advisors: Linda Wills, Jeff Davis, James ~~3~~ Hamblen
(email them to inquire interest)

③ Google Drive

④ Team name: Mirror Mirror on the Wall, Mirror Master,

⑤ Meeting times: When is good.

Follow-up w/ Smart Mirror research

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Meeting Minutes Notes: Meeting 2 2/10/2020

Smart Mirror: Feature BrainStorm

- Alexa connect
- Video Casting
- Speech recognition.
- Smart board for education
- Change background
- display videos
  - workout videos
- Wii fit / Kinect open Source
- Hologram
- Security purpose ← FPGA?
  - → facial recognition } will require
  - → image processing } industrial-grade microprocessor w/ ind. GPU.
- brightness controls.
- wifi / bluetooth ~~capable~~ capable.
- distributed power: (trade off: power/functionality
- able to connect

Things to Consider.

1. power consumption
2. portability / compatability
3. Purpose / customizability
4. Features: realistic and capable to our capacity
5. Size of Mirror
6. Cost.
7. connectivity via bluetooth (other devices)
8. user input method (voice or touch or buttons)

* Meet w/ Dr. Wills 2/11/2020 *

* Look into existing Smart Mirros / limitations

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Meeting Minutes Notes: Meeting 2:5 w/Dr. Wills 2/11/2020.

Dr. Wills comments and question's:

- Our train of thought:
  - mirror usable as smartboard
- Power Consumption ← my comment: Not an issue w/internal and external power supply
- Size: "Is there a size limitation ← No, range from small to 95" diagonal 16:9 display
- Wifi / Bluetooth? ← built-in w/raspberry pi unit or adapter USB available
- Touch Screen ← my comment: IR frame.
- Cost? ← My comment: I approx ~$700-800 budget req

Note: Next steps for her as advisor
→ inform Dr. Frazier

We may need ~~a Pr~~ an another Secondary Prof who specializes in Infrared Laser technology ~~for~~ for our touch screen display.

Things to do:
- Project Summary

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Meeting Notes Meeting 3 2/12/2020

* PROJECT SUMMARY (3/11) * TECHNICAL REVIEW PAPER (2/27)
w/ Team Strengths/weakness Analysis

* presented stapled drawing

Goal

① Narrow Scope of project.: our limitations/ability
- 4-in-1 product
  - Mirror_Plain
  - Smart Mirror
  - Wall Painting
  - TV for Videos

user input:
- touch ← IR FRAME
- voice ← microphone needed. // Alexa-enabled
- buttons

remote select when leaving home or something. // aesthetics.

Look into IR Frames to understand about it more.

② determine size of 4-in-1 : full fledge display unit size (LCD or LED Monitor or TV)

③ Raspberry Pi : Wifi/bluetooth enabled or adapter
↳ (4+ GB ram) May not provide sufficient power.
- External power source

④ Alexa feature: Amazon OPEN SOURCE Dev. tools via Raspberry Pi

⑤ customizability : Rain Meter w/ touch enabled // RGB 100% NEEDED!!
user friendly

Things to do:
- IR research
- Power Research
- Linux compatibility w/ Rain Meter.
- Consider user-friendly interface

Meeting Minutes Notes: Meeting

Note: Meet w/ Dr. Linda Wills Thursday (3/5)

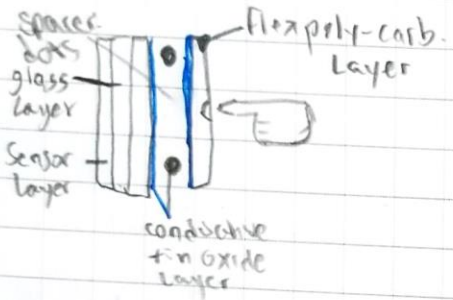
(optical)
IR-FRAMES are ideal w/effectiveness. BUT Fairly expensive

Other less effective options

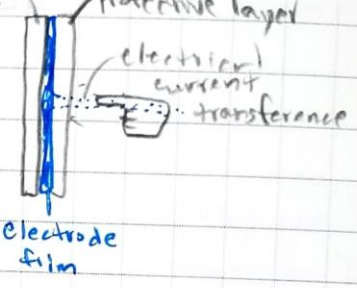
① - Resistive
② - Capacitative

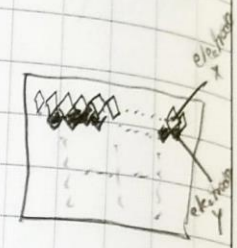
] capacitive > $ resistive.
resistive less touch sensitive

① Common



② Glass





Sensor detect ΔV w/touch
two-touch max
Finger only
thick layer = < clarity
" " = < Sensitive
easy to scratch
Least Expensive

Multi touch
more expensive
durable glass
Limited screen sizes.

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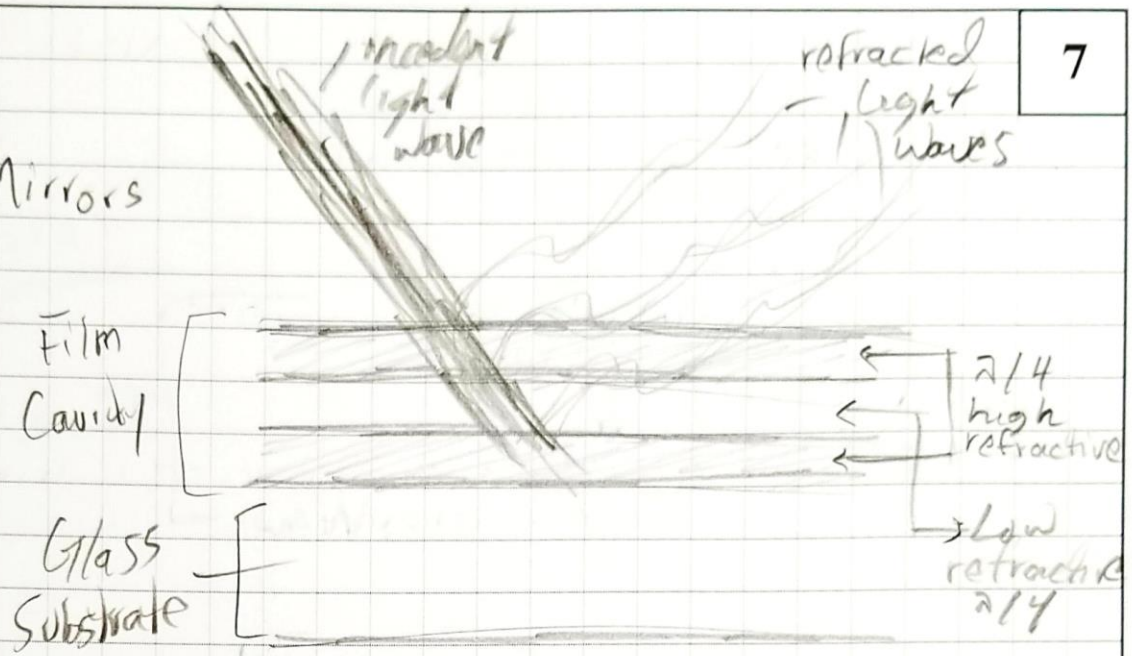
Notes:

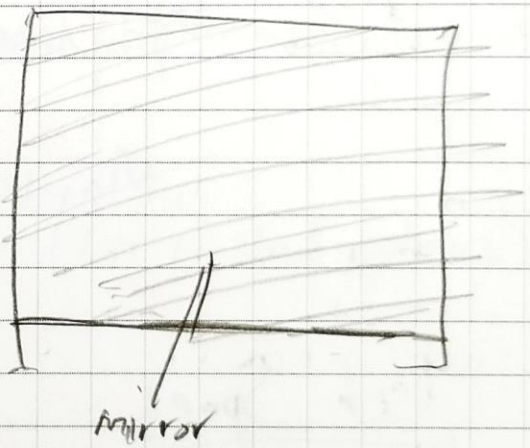
Dielectric Mirrors



Dielectric Mirrors

ratio: (reflective - trasparent)

30-70	← preferred
40-60	
35-65	
45-55	x
20-80	x
25-75	



Note: ratios can't be to extreme

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Project Plan

Proposal

Intro → Project overview — Tara

Tech. Specs → Implementation — Rahul

Hardware ⇄ Integration/Testing ⇄ Software

Market Analysis — Madi

Tech Specs

Wifi / Bluetooth adapter
Raspberry Pi - Unit
Display
Mirror
IR frame

RP unit - Explain pros/cons
Display unit - 32" (monitor preferred)
IR frame - Compatible w/ RP unit?

Material cost
Labor
Software programming

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Potential Software

- Rainmeter
- Conky
- RazerLabs

Things to consider

operating System compatibility

* - rainmeter - Windows 10 OS. (optimal choice)
  - Conky - Linux
  - RazerLabs - Windows / Linux (but limited options)

Rainmeter (on laptop) ✓safe

CPU usage: 4-6%
GPU usage: 1-3%
RAM usage: ~ 2.5kb Max.
Arch: 32-Bit or 64-bit Windows OS Arch.

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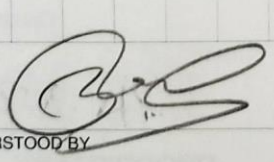
SIGNATURE 

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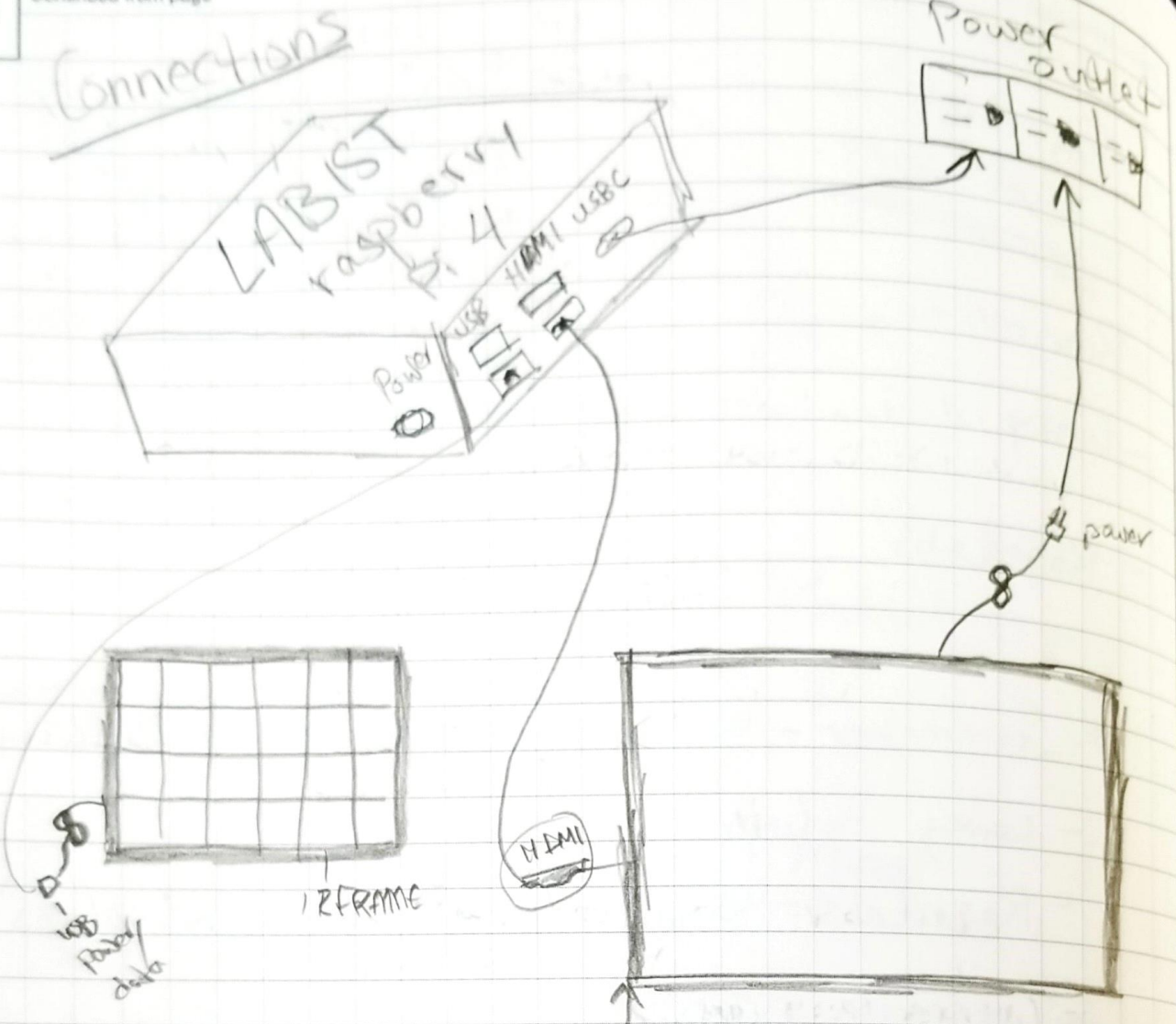
Connections



None of these images are to scale size

1) Strip Exterior Casing
2) Fit IR frame overlay

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Raspberry Pi

Choice: Labists RP4B

Amazon $99.99

Website: $99.99 + student discount.

is there a way to add memory modules?

REQ

~ 4GB + RAM

~ Micro-SD Slot - 32 GB (Minimum)
- Class 4 (Minimum Support)

- HDMI or Micro HDMI (2.0 x 2)

optional
- Wifi support (802.11 b/g/n/ac) (2.4GHz or 5GHz)
- Bluetooth Support (4.2 module)

- DI port lane
- Camera port lane
} GPIO 40 pin header Support

- NOOBS PREINSTALLED - Window IoT core OS

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CASTING SETUP

~~Video casting w/RaspberryPi~~

1. ChromeCast – connect ChromeCast to RP unit. * done *

or

2. Raspberry Pi Alternative (RaspiCast)
   - Raspian OS
   - Mouse/keyboard dongles
   - Connect to Network
     - ↳ SSH
     - ↳ sudo apt-get install libjpeg8-dev libpng12-dev
     - ↳ OMNIX-S
       - → git clone "Haariger Harald" github
       - → CD omixv
       - → make ilclient
       - → make j4
       - → sudo make install
     - ↳ RaspiCast in Phone
     - ↳ config w/ IP Address

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Amazon Alexa Dev Tools

1. Raspian OS → MicroSD card
   ↳ unzip → ↑
2. Microphone USB → RP unit.
   Audio output
   Mouse/keyboard/ethernet
3. Install Raspbian
   configure OS → connect to internet
   enable speaker
   enable Microphone
4. update Pi package
   - /home/pi ← terminal directory
   - cd/home/pi
   - sudo-apt get upgrade
5. Register Raspberry pi unit w/ AVS credentials.
6. Build AVS Device SDK (Terminal file)
7. Install Sudo Script.
8. Wake Word "Alexa"
9. Refresh token
10. Test *DONE*

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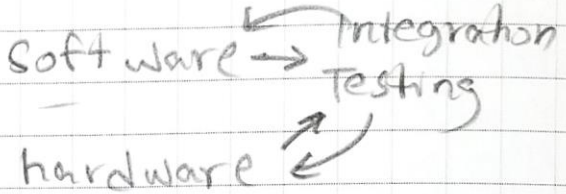
Meeting w/ Dr. Wills NOTES

Look over Time line

↳ Gantt Chart

↳ Add potential room for delays in shipping.

↳ Project flow



Alternatives:

- small display w/ touch-enabled device

USER INTERFACE LAYOUT

- RAINMETER SAMPLES

(+) - RSS - Live feed imbedded into HTML code.

QFD Chart

(+) → CUSTOMER REQ: Aesthetics/ease of config.

(+) Mention additional port layout

(+) EST. cost not include Misc fees

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HTML Widget Code

Layout

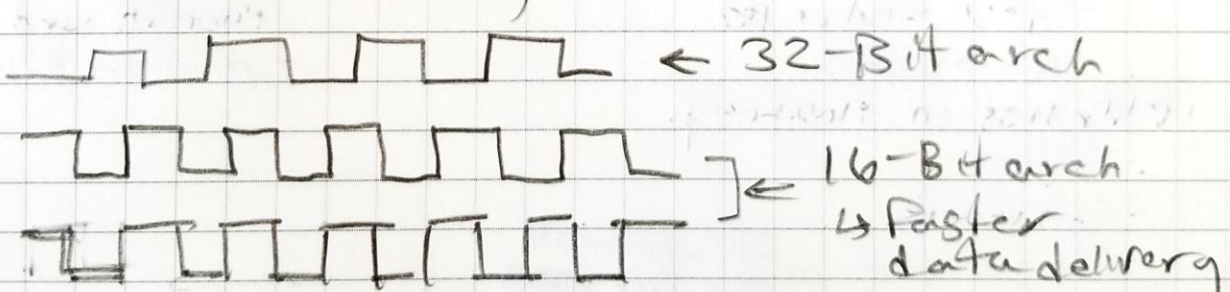
```
<!DocType html>
<Html>
    <head>
        <Title> "Widget_Title" </Title>
        <link> "RSS_Link "
    </head>

<body>
    <h1>
        — header —
    </h1>

<input>
    <read / RSS Link>
```

MEMORY – LPDDR4

2-way 16-Bit Architecture



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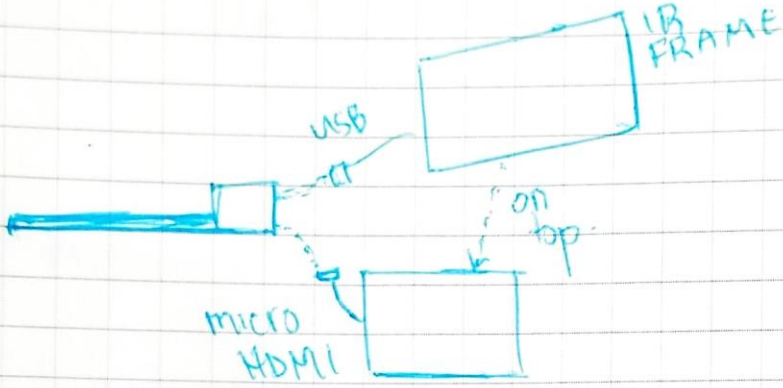
IR Frame: 4 parts - assembled
2 screws each side.
↳ Problem: can't get "Left-click"

Raspberry Pi 4: Windows OS to 3GB. (Manual override
Audio/wifi/Bluetooth adapter driver issues
Fan installed. w/ GPIO pins 4 and 6



Two Options for Windows OS installation.
① USB Boot
② MicroSD Boot

① WOA Der. for RPi4
- ARM64 Windows ISO
- Woa → WinPatch.

② Windows on Raspberry.
- WinPatch
- Cmd prompt
- Edit config.txt : over_voltage=6
arm_freq=2000
- Edit manual RAM override.

for USB Boot
- Pi 4 eeprom on MicroSD card
- install on RPi4

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Complications: Page 16:

- Slow OS - tried troubleshoot / optimization / reinstall OS
- Failed drivers: wifi / Bluetooth / Audio - Adapter + Ethernet
- 3 GB RAM Limit. → 8 GB enabled.
- Original TV didn't work → New TV

- TV new res low

- Second installation of Windows OS failed
- Third Version of Windows OS

If doesn't work, reinstall first OS (slow)

- Rainmeter wouldn't pull all files in .rmskin properly.

- No Mirror → Mirror Film
- dual monitors not supported. UEFI not supported.

Unifiable Extensible Firmware Interface.

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Email to: ece4012report@ece.gatech.edu, linda.wills@ece.gatech.edu

cc: madeleineloui@gatech.edu, tpoteat3@gatech.edu, calebsalexander@gatech.edu, jake.webb42@gatech.edu, rbalamurali3@gatech.edu

Subject: ECE4873D2A: Group Number: 3, Group Name: Smart Look, Weekly Report

Smart Look Status Email

Madeline Loui | CmpE | mloui3 | madeleineloui@gatech.edu | 585-483-9984
Rahul Balamurali | CmpE | rbalamurali3 | rbalamurali3@gatech.edu | Group Leader | 770-826-6945
Tara Poteat | CmpE | tpoteat3 | tpoteat3@gatech.edu | 910-262-5765
Jacob Webb | CmpE | jwebb38 | jake.webb42@gatech.edu | 210-249-1760
Caleb Alexander | EE | calexander49 | calebsalexander@gatech.edu | Web Master | 919-807-9261

Group Website: Not Yet Assigned

Primary Advisor: Whit Smith ECE
Secondary Advisor: Linda Wills ECE

Problems:

- Budget is $700, can't find sponsors
- We need to consider materials

Current Status:

- Met new group members from the summer
- Have a good idea of materials we need to purchase
- Go through syllabus

Task Status: Actions on last week's Action Items

- We decided to have weekly virtual meetings with our group and advisor on Wednesday's at 12:30
- Additional group meetings will be on Monday's at 12:30 if needed

Planned Tasks: Action Items for the upcoming week

- Oral presentation powerpoint w/advisor Dr.Wills, Wednesday August 26th 12:30 p.m.
- Update proposal based on advisor feedback
- Contact manufacturers for quotes

Smart Look Status Email: Week of 8/24

Problems:

- Not sure if we will have sponsorship yet, so Caleb will look for materials already available to borrow from the IDC
    - We are taking steps to seek sponsorship, putting together a sponsorship letter of sorts and sending it to Dr. Frazier. Then he will send it to the appropriate sponsors

Current Status:

- Working on sponsorship summaries and will send those out this week
- Starting to choose desktop customization tool (Conky vs. Rainmeter)

Task Status: Actions on last week's Action Items

- Created presentation for the oral presentation to the advisor
- Revised proposal based on feedback from the first semester

Planned Tasks: Action Items for the upcoming week

- Download and become familiar with Conky / Rainmeter as user interface software
- Try to customize an interface and share features with the group
    - Madi and Jake will experiment with Rainmeter
    - Tara and Caleb will experiment with Conky
- Once we hear about sponsors, revise proposal to narrow down what functionality the mirror should have
- Reach out to manufacturers for quote on materials after we get confirmation on sponsorship

Updates/links

https://www.canakit.com/raspberry-pi-4-8gb.html?cid=usd&src=raspberrypi ($120 + tax)
NOTE Caleb has a raspberry pi 3

Materials / Manufacturer Quotes

Smart Look Status Email: Week of 8/31

Problems:

- Still not sure if we will have sponsorship yet
    - We sent the sponsorship documents to Dr. Frazier, however, we still haven't heard any response
- Caleb went to look for materials already available to borrow from the IDC, didn't have a lot of the materials that we were looking for other than a raspberry pi unit
- A couple of us don’t have monitors/HDMI/keyboards to connect to raspberry pi to experiment with it

Current Status:

- Team members compared desktop customization tool (Conky vs. Rainmeter)
- Rainmeter seems easier to use
- Start creating a story board

Task Status: Actions on last week's Action Items

- Team members experimented with Rainmeter/Conky to get familiarized and to compare usability

Planned Tasks: Action Items for the upcoming week

- Experiment with Raspberry Pi - Caleb will give extra Raspberry Pi’s to the rest of us
- List of what we would want to include in user interface, make some drawings for visual design
- Create storyboard
- Update Jake on what we talked about
- Windows on Raspberry Pi - Noobs: https://www.raspberrypi.org/documentation/installation/noobs.md

Updates/links

https://www.canakit.com/raspberry-pi-4-8gb.html?cid=usd&src=raspberrypi ($120 + tax)
NOTE Caleb has a raspberry pi 3

Materials / Manufacturer Quotes

Smart Look Status Email: Week of 9/6

Problems:

- We have to figure out material quotations, so we have to reach out to manufacturers
- What is the process for buying materials? Is it through FPL? Or reimbursement?
- Mirror mode transitions, multitasking, store the state?

Current Status:

- We got sponsorship from FPL (~$1k + maybe more)
- Smart home features, display energy stats
- Decide on Windows/Rainmeter because many resources for it

Task Status: Actions on last week's Action Items

- Created storyboard
- Continued experimenting with Rainmeter

Planned Tasks: Action Items for the upcoming week

- Finalize costs since we have a sponsorship now
- Finalize materials and send quote requests to mirror/IR-frame manufacturer - Rahul
- Follow up with FPL/Dr. Frazier (may have different goals, figure out how we will purchase materials) - Rahul
- Document why we chose Rainmeter over Conky (pros and cons) - Rahul, Caleb
- Start prototyping with Rainmeter - Caleb, Madi, Tara
- Check out open source home automation softwares/other softwares (phase 1) - Jake

Smart Look Status Email: Week of 9/14

Problems:

- What is the process for buying materials? Is it through FPL? Or reimbursement?
    - Haven't been able to contact Dr. Frazier regarding a meeting with sponsor
- Mirror mode transitions, multitasking, store the state?

Current Status:

- We got sponsorship from FPL (~$1k + maybe more)
    - ~$100 -> Raspberry Pi 4
    - ~$350 (32”) or ~$500 (40”) -> Dielectric Mirror, from TwoWayMirrors
    - ~$250 for IR frame
        - Most likely will buy from amazon
    - ~$300 for 32” or 40” display

    - ~$1000 * includes estimated tax rates but not shipping expenses

      We meet our sponsor’s given budget
- Started making Rainmeter interface
    - Use this skin: https://www.deviantart.com/michaelpurses/art/Sonder-Rainmeter-skin-838147223
    - There’s a button that can turn on/off rainmeter (smart mirror <-> mirror transition)
- Looked at OpenHAB (home automation, Windows)
    - Complex installation
    - Unsure about interface
    - Supports Amazon Alexa
- Home Assistant
- FPL Energy App: https://appsforwindowspc.com/download-fpl-for-pc-windows/
    - https://www.fpl.com/landing/mobile-app.html
    - Use mobile emulator
    - Ask FPL for a demo account
- Covid tracker - https://gatech-covid-tracker.com/

Task Status: Actions on last week's Action Items

- Created storyboard
- Continued experimenting with Rainmeter
- Prototyped with Rainmeter
- Researched open source home automation softwares + Raspberry

Planned Tasks: Action Items for the upcoming week

- Finalize materials (create spreadsheet) and start ordering ASAP
- Sponsor noted on all relevant documents - Rahul
- Continue prototyping on Rainmeter - Madi, Tara, Caleb
- Document why we chose Rainmeter over Conky (pros and cons) - Rahul, Caleb
- Follow up with FPL/Dr. Frazier (may have different goals, figure out how we will purchase materials) - Rahul
- Research home automation software - Jake

Smart Look Status Email: Week of 9/21

Problems:

- What is the process for buying materials?
    - Is there a form for submitting orders?
- Mirror mode transitions, multitasking, store the state?
- The quotes received from the mirror manufacturers are doubled to what we had previously allocated for it, but with FPL sponsorship funding we are still underbudget
- Still no quotes from IR frame manufacturers
    - Worst case scenario, we can order IR frames from Amazon

Current Status:

- Dielectric Mirror:
    - 32": $302.21+shipping
    - 40": $448.17+shipping
    - 50": $1477.39+shipping
- IR Frame: 32” ~$150 || 40” ~$200
- Discuss meeting times for meet w/FPL

    Monday: 12:30pm-5pm
    Tuesday: 11am-4pm
    Wednesday: 12:30pm-5pm
    Thursday: 1pm-5pm

Task Status: Actions on last week's Action Items

- Prototyped with Rainmeter
    - Linked to apps rather than websites
    - Found template for sliding/different screens
- Researched open source home automation softwares + Raspberry

Planned Tasks: Action Items for the upcoming week

- Rainmeter - create sliding screens, other apps
    - Possibly get mobile emulator to work
- Send a intro email to James Steinberg, he will be our contact for FPL
    - Discuss progress in terms of Rainmeter and/or raspberry pi integration
    - Type Weekly report and send it for submission
    - Discuss changes for documentations (mainly summary/proposal)
    - Discuss creating a "How-to" manual for software setup
- Send email to FPL to plan meeting time
- **For FPL meeting**
    - **Create a specific list of items to order and prices to present to FPL**
    - **Update proposal**
    - **Update presentation to include current prices and screenshots of storyboard**
    - **Live demo of Rainmeter**
- Start ordering materials after meeting ($1k limit)

Smart Look Status Email: Week of 9/21

Problems:

- Not sure about the status of our sponsorship with FPL so we might have to revert back to ECE funding, in which case we need to reconsider some budget.

Current Status:

- We want to stick with our original mirror design/purpose rather than redesigning our entire work/progress

Task Status: Actions on last week's Action Items

- Continued working with Rainmeter
- Prepared presentation for FPL

Planned Tasks: Action Items for the upcoming week

- Get in touch with Dr. Frazier, set up follow up meeting
    - CC Dr. Steinburg
    - Thursday or Friday
- Build BOM -> Dr. Steinburg for ordering
    - Raspberry Pi == #1 priority
- Bluestacks -> check if emulator works (for home automation)

Smart Look Status Email: Week of 10/5

Problems:

- Never had follow up with Dr. Frazier about sponsorship

Current Status:

- Need to order parts ASAP

Task Status: Actions on last week's Action Items

- Continued working with Rainmeter
- Continued working with home automation
- Sent follow up emails, but no responses

Planned Tasks: Action Items for the upcoming week

- See if Dr. Frazier responds about follow up - All
- Start ordering parts - All
    - Look at the process for ECE: http://eceseniordesign2020fall.ece.gatech.edu/labs/FundingSources/2020Fall/FundingSources.htm
    - Amazon Prime Day
    - Order dielectric mirror after checking measurements of display upon arrival
- Continue creating Rainmeter interface - Madi and Tara
    - Bluestacks -> check if emulator works (for home automation)
- Compile all bill of materials - Rahul
    - Meet Monday to look over build materials then send them to Dr. Steinberg - All
    - Raspberry PI 4 || 32” display || 32” IR frame

Smart Look Status Email: Week of 10/12

Problems:

- Never had follow up with Dr. Frazier about sponsorship
- Have to place two separate orders, possibility of a delay

Current Status:

- Need to order parts ASAP (by the end of the week)

Task Status: Actions on last week's Action Items

- Continued working with Rainmeter
- Continued working with home automation
- Created bill of materials and will order soon

Planned Tasks: Action Items for the upcoming week

- Send out materials to ECE department to order - Rahul
- Continue creating Rainmeter interface - Madi and Tara
    - Bluestacks -> check if emulator works (for home automation)
    - Add more applications
- Test rainmeter files to work with the RaspberryPi - Caleb
- Home Automation - Jake
- Get started on team website - Caleb

Smart Look Status Email: Week of 10/12

Problems:

- Need to find a time to meet up
- We couldn't buy a dielectric mirror we wanted, was too expensive for us to buy despite reimbursement
    - Bought 1-way mirror sheets instead
- Hardware limitations with Raspberry Pi 4
    - Need Windows on Raspberry for Windows 10 - very slow but the image processing software works
        - Runs on IOT core
    - Most peripherals would not be available, so features like Bluetooth, WiFi, and Ethernet would need adapters
    - Uncertain about IR frame
    - Can we have Windows on Raspberry and all the other features running on the Raspberry Pi at the same time?
- Where to meet?
    - HIVE has limited hours
    - Dr. Wills lab - probably shouldn't leave stuff because door could be left open
    - Can we bring our equipment there each time?

Current Status:

- Parts ordered through amazon, and ALL part have arrived
- We have a sudo test version of a functional rainmeter interface
    - Need to integrate it into raspberry pi
- Meet up next week to start working with hardware

Task Status: Actions on last week's Action Items

- Need to meet up soon to assemble and integrate parts

Planned Tasks: Action Items for the upcoming week

- Continue creating Rainmeter interface - Madi and Tara
    - Bluestacks -> check if emulator works (for home automation)
    - Add more applications
- Test rainmeter files to work with the RaspberryPi - Caleb
- Home Automation - Jake
- Get started on team website - Caleb
- Meet together to put hardware together (next Wednesday) - all
- Send Dr. Wills name and GTID - all

Smart Look Status Email: Week of 10/12

Problems:

- Planned on meeting up but we decided to not carry all the materials in the rain so postponed in-person meetup
    - Possible other collaboration methods

Current Status:

- All parts arrived
- Ready to assemble
- Rahul and Caleb will work on hardware together and update the rest of us
- Madi and Tara and Jake can finalize software (Rainmeter) once hardware parts are assembled

Task Status: Actions on last week's Action Items

- Bluestacks
    - Downloaded app/emulator successfully
    - AT&T digital life app works with bluestacks emulator; need to log in still
- Researched Raspberry Pi/Windows issues
    - Updated Windows version that doesn't mess with ports
    - There's a way to start up Raspberry Pi where it uses all 8GB RAM

Planned Tasks: Action Items for the upcoming week

- Continue creating Rainmeter interface - Madi and Tara
    - Stay updated on hardware progress
- Get started on team website - Caleb
- Need to meet up soon to assemble and integrate parts - Rahul and Caleb will meet (maybe virtually)
    - Test rainmeter files to work with the RaspberryPi
- Reimbursement - need to submit request by Nov 30th - Madi, Tara, Jake

Smart Look Status Email: Week of 10/12

Problems:

- TV we ordered does not work so we have to wait for the new one to come in

Current Status:

- IR frame, raspberry pi are connected and work together
- Currently have a draft Rainmeter skin

Task Status: Actions on last week's Action Items

- Most of the hardware is put together

Planned Tasks: Action Items for the upcoming week

- Test Rainmeter on the Raspberry Pi
- Test IR frame with monitor
- Keep working on Rainmeter skin
- Download applications on Raspberry Pi

Integration Testing Procedure:

IR FRAME

Came as 4 separate parts. Assembly was very easy, just attach the sides with correct labels and secure it with 2 screws for each attached side. Then connect the usb connection on to a system. It was driver free and compatible with various devices. At this moment, i did not have the Raspberry Pi assembled and configured so i tested it with my personal windows laptop and it worked perfectly. The only problem is that i can't get the “left click” aspect of the touch to work because there is no wall or block support to register as touch since right now it's just an open back. I believe it will work better as a double tap and will test it out when the new monitor arrives.

Raspberry Pi

Original issues: Windows OS installation on the RP4 limits ram to 3gb, disables ports and drivers (audio/wifi/bluetooth), slightly slow.

Current status and issue: I disabled the Memory limiter manually on the device boot manager itself, that fixed the ram limitation to where it functions on all 8GB ram. I installed an updated version of the WoR Windows10 Core that patched the port issues on boot-up. The Drivers are all still disabled. However since the ports are all working a work-around solution can be to use USB adapters for each driver. The ethernet port is functional so we have access to the internet via ethernet. With audio issues, the driver basically doesn't exist. So other than getting an audio adapter, another method could be to manually reroute all audio directly to the TVsys with the hdmi controls. Essentially, it will be like manually registering the TV audio driver as the raspberry pi’s audio driver.

Fan installed on raspberry pi with the GPIO pins 4 and 6 as instructed in the RP4 manual and works upon startup correctly. Heat sinks were installed on the highest heat sources, CPU and two microcontroller grids.

Next step would be to install rainmeter and test it on the RP4 with KBM prior to testing it with touch functionality IR frame installed.

Smart Look Status Email: Week of 11/9

Problems:

- Raspberry Pi w/ Windows OS is slow. Testing Multiple versions of the windows OS.
    - Some versions are either slower, non-functional peripherals, etc.
    - Rainmeter skins generated is slow and borderline not usable
        - I believe it is due to the hierarchy of our rainmeter skins format
        - NXT OS _ Rainmeter

Current Status:

- Testing Multiple versions of the windows OS.
- Caleb and I (Rahul) are testing different versions of Windows Arm OS on our own Raspberry Pi devices to observe performance variations between the Windows OS
    - Need to finalize version selection by Thursday (11/12)

Task Status: Actions on last week's Action Items

- Tested Rainmeter on the Raspberry Pi
- Tested IR frame with monitor
- Finalized Rainmeter skin
- Downloaded needed applications on Raspberry Pi

Planned Tasks: Action Items for the upcoming week

- Updated Rainmeter skin with applications and connected with filepath.
- Proposal needs to be updated
- Make a how-to-guide
- Figure out presentation deliverable for EXPO
- Create website and upload current deliverables by (Nov 23rd)

Integration Testing Procedure (Rahul) Email transcript sent to team and advisor:

I did get windows working on the Raspberry Pi 4. After our meeting I was able to get Rainmeter running browse the internet and use the app store to install few apps, however two things with that – ONE is that some of the Rainmeter actions didn't work (I assume it is because when I download it from the google drive it doesn't download completely with necessary or equivalent file paths and I met with madi and tara later today regarding this to see if we can find a solution) and TWO is that it is very very slow.

I found a few different versions and/or methods of installation for the Windows on Arm imager where the some version's are quite frankly running faster and smoother than the version I currently have installed on the RP4. Each installation takes anywhere between 3-4 hours because the imaging software takes a long time to format the boot SD card. We still have 4 weeks for the final submission for the prototype, so I think it would be beneficial if I took the next couple days trying to install and test different versions of the windows imager. This would allow me to get faster and smoother RP4 windows to work with and I've seen some installation tutorials for a few of these versions that show that the audio driver working, which if you remember was one of the drivers that was not functional with our currently installed RP4. Ideally, I'd like to stop these trials either after trying out 4 versions or by this Thursday, whichever comes first, just so we don't hinder on the this for too long. Once these trials are over, I will load or reload the boot SD with whichever one was or seemed the fastest.

@Alexander, Caleb S If you have the time, would you mind doing the same thing. Like try installing your Raspberry Pi device with a couple versions and test it out and get whatever observations you can about each of them, i.e. the responsiveness and functional peripherals. I know since you would probably be driving to GA on Wednesday during our meeting you and I can briefly discuss your versions. And by Thursday we will have a final version that will be uploaded into the boot drive.

Smart Look Status Email: Week of 11/9

Problems:

- Nothing much

Current Status:

- Hardware works, mirror is pretty reflective
- Audio driver does not work because we aren't using official Windows OS
    - Can use Bluetooth speaker

Task Status: Actions on last week's Action Items

- Found RockPi which is a good windows alternative to Raspberry Pi
- Basically done with prototyping the mirror - brought it to campus

Planned Tasks: Action Items for the upcoming week

- Finish up documentation: Rahul
- Presentation: Jake lead: Jake & Caleb & Rahul record parts;
    - Everyone make slides -> Once we make slides -> split into parts
    - Outline:
        - Overview
            - Purpose
            - Functionality (4 in 1)
        - How everything is put together / components
            - Hardware (IR frame, Raspberry Pi)
            - Software (Rainmeter)
        - Why each part is important to project
            - IR frame: Touch screen
            - Raspberry Pi: compact
            - Rainmeter skin: Customization
        - Future Work
            - Rock Pi?
            - Audio / voice capability
- Video Demo: Tara & Madi
- Website: Caleb
- Poster: based off of presentation: everyone
- Look at past demos/presentations: everyone