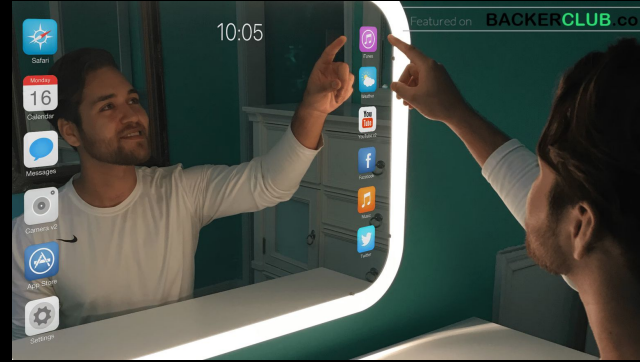


Use-Case

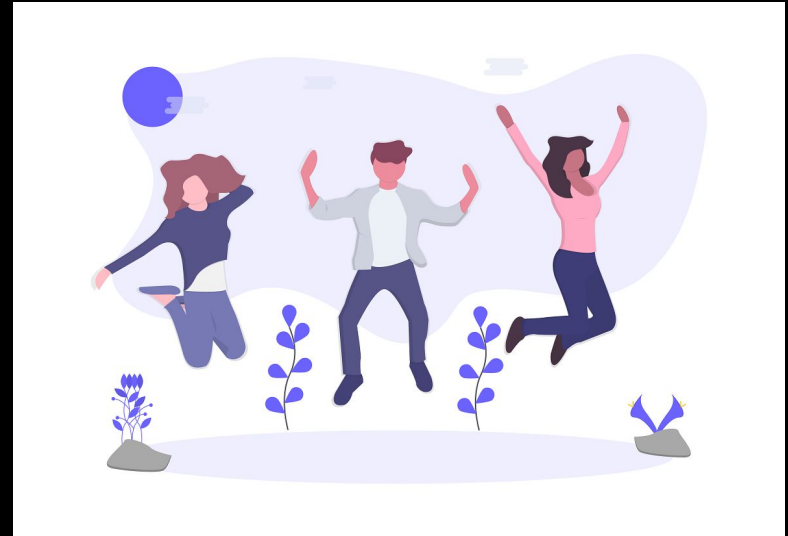
The goal of our project is to create a device that will assist our users in picking an outfit for their busy day.

By implementing AI Vision technology and a user-driven database consisting of their wardrobe, we can create a smart mirror that is able to analyze your top and give you suggestions on how to complete your outfit.

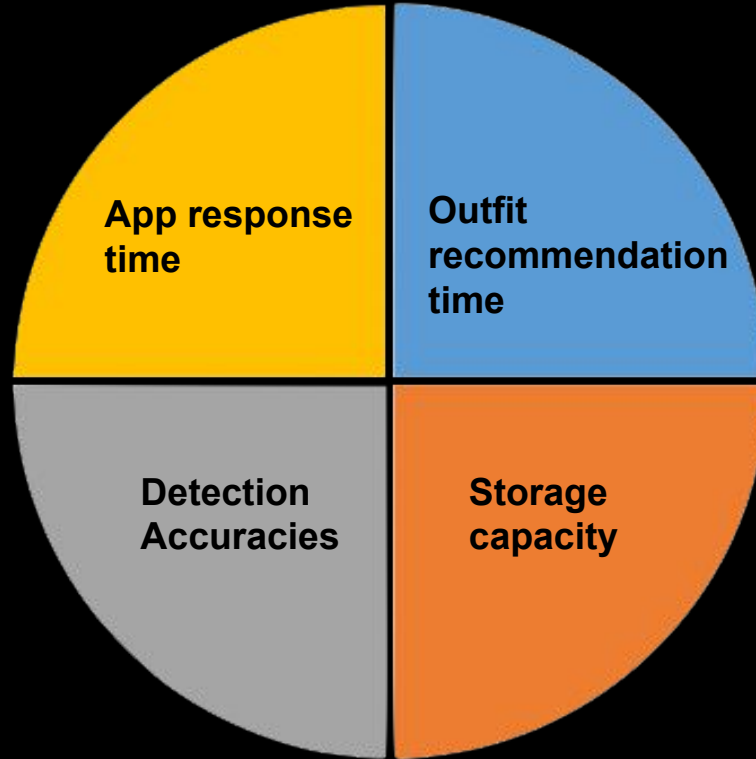


Use-Case Requirements

- Prioritize smooth and enjoyable experience
 - Convenience
 - Time efficiency
 - Accuracy
- Identify the necessary metrics
 - App Response Times
 - Recommendation Times
 - Detection Accuracies
 - Storage Capacity



Use-Case Requirements Explanation



Quantitative Use-Case Requirements

APP

Database Latency < 200 ms

ON/OFF Response Time < 1 s

LED Lighting Control < 1 s

Database Storage Capacity > 2GB

Database input time < 1 s

ANALYSIS

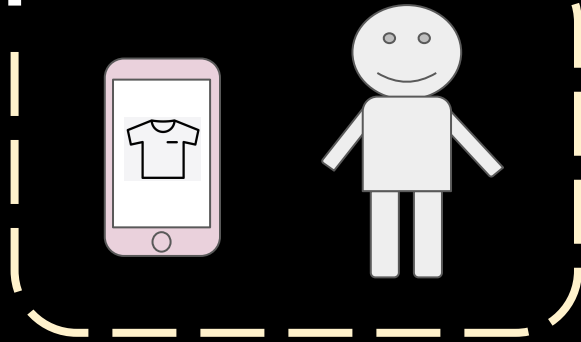
Outfit Recommendation < 5s

Torso Detection Accuracy > 99%

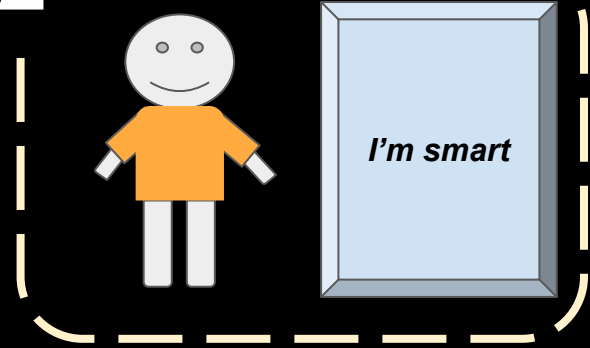
Color Detection Accuracy > 95%

Solution Approach

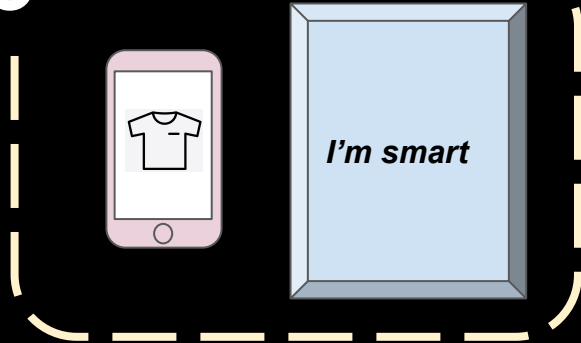
1 Register wardrobe



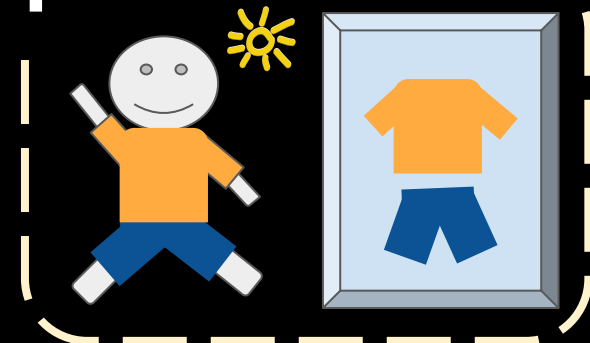
2 Stand up in front of My-flection



3 Transfer data & computation



4 Recommend outfits



System Specification

Outfit recommendation

1. User) Stands up in front of the mirror
2. App) Adjusts lightings
3. Camera) Takes an image input
4. Jetson) Send the img file to software
5. Software) Detects torso & color
Recommends outfit
6. Mirror) Outputs results

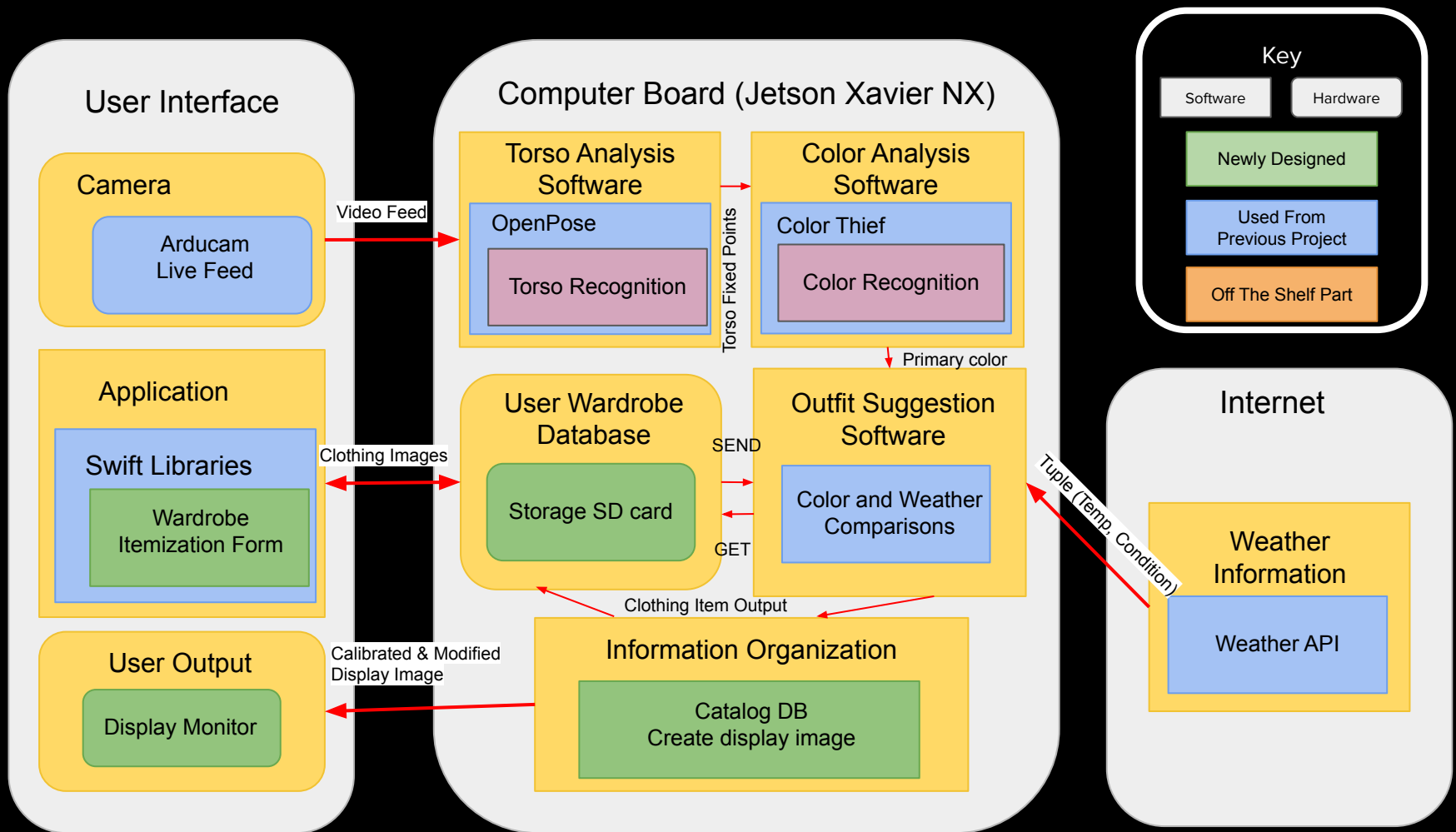
A PAIR & A SPARE
WARDROBE REHAB
COLOUR
DRESSING GUIDE

IF YOUR MAIN COLOUR IS	CREATE EASY COMPLEMENTARY OUTFIT PAIRING WITH	OR GO FOR A TONAL OUTFIT
PINK	Light Blue, Dark Blue, Grey, White, Black	Red, Yellow
RED	Light Blue, Dark Blue, Grey, White, Black	Pink, Yellow
ORANGE	Green, Light Blue, Dark Blue, White, Black	Yellow, Brown
BEIGE	Dark Blue, Purple, Brown, White, Black	Yellow, Orange
YELLOW	Green, Dark Blue, White, Black	Yellow
GREEN	Orange, Purple, White, Black	Yellow, Light Blue
LIGHT BLUE	Pink, Red, Orange, White, Black	Dark Blue, Purple
DARK BLUE	Pink, Red, Yellow, Grey, White, Black	Light Blue, Purple
PURPLE	Orange, Grey, Green, White, Black	Light Blue, Dark Blue
BROWN	Yellow, White, Black	Orange
GREY	Pink, Red, Dark Blue, Purple	White, Black

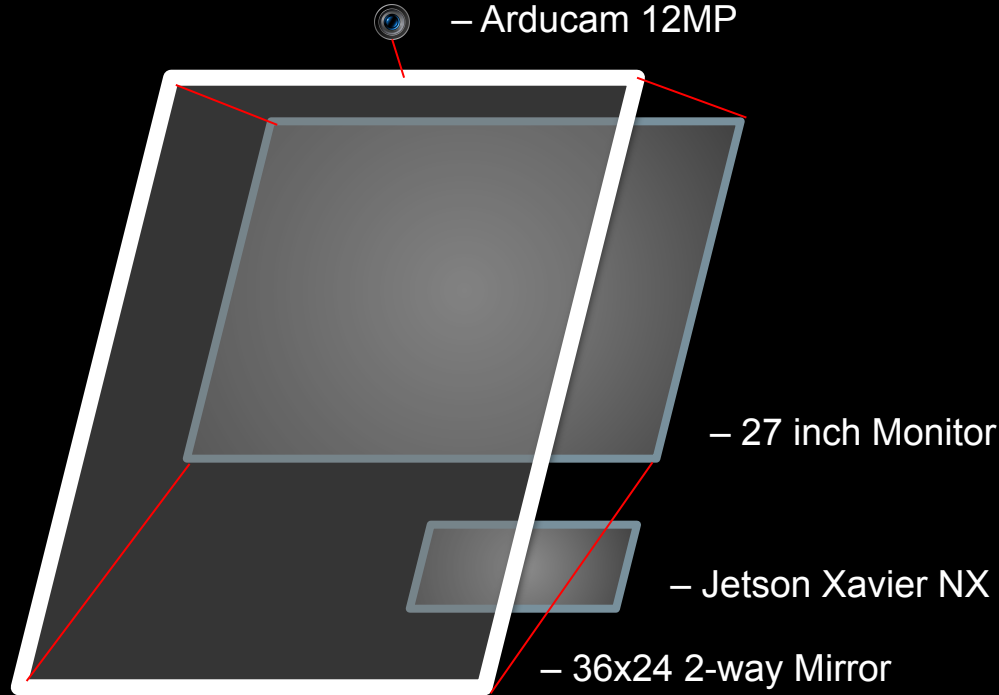
Outfit storage

1. App) take a pic of 1 outfit(t-shirt, pants, etc)
load & analyze the pic(color, type)
store @ DB
Weight clothes by preference, when they were last worn, etc
2. User) remove from DB if clothes are not available





Hardware Components



Item
Nvidia Jetson Xavier nx
Arducam B0250
36x24 Two-Way Mirror
27-inch HP Monitor
16 GB micro-SD card

– Items purchased so far

Implementation Plan

- **Hardware Components**

- Jetson Xavier NX
- Arducam 12MP IMX477
- 32 inch Monitor
- 42 inch two-way mirror



- **Software Components**

- App Development: Swift or React Native
- Color Detection API: ColorThief
- Torso Detection: Openpose
- Real-Time Weather API: National Weather Service API
- Data Analysis: OpenCV in C++
- Database: CSV file





Testing

Requirement	Test	Metrics
Torso Detection	Analyze fixed points	99% accuracy
Color Detection	Within range	100% within
Outfit recommendation time	Average over 10 trials	0.5s margin of error
Mirror On/Off response time	Average over 10 trials	0.1s margin of error
LED lighting On/Off time	Average over 10 trials	0.1s margin of error
Database input time	Average of 10 trials	0.1s margin of error

Risk Mitigation

- Risks of torso detection
 - Set an outline or specific distance/angle of the camera that will increase accuracy of torso detection
- Risks of inconsistent lighting
 - LED Lighting
 - Recommend user to stand in well-lit environment



Project Management

- User Interfaces
 - Wonho
 - Ramzi
- Hardware Implementation
 - Wonho
 - Ramzi
- Torso Analysis
 - Jeremy
 - Yun
- Color Analysis
 - Jeremy
 - Yun
- Outfit Analysis
 - Jeremy
 - Yun
 - Wonho

Item	Manufacturer	Model Number	Source	Cost
Nvidia Jetson Xavier nx			ECE Inventory	\$0
Arducam B0250			ECE Inventory	\$0
36x24 Two-Way Mirror	SPEEDYORDERS		Amazon	\$192
27-inch HP Monitor	Hewlett Packard	M27ha	Amazon	\$174.08
16 GB micro-SD card	Sandisk	SDSQUAR-016G-GN6MA	Amazon	\$8.83

