# 10ft Interface and Controller Prototype

Smart TV UI & Controller

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# Project Deliverables

**Scenario:** Tasked with creating a new studio-specific proprietary streaming device and application (like a Chromecast or FireTV stick). Plan out the interface and how the user navigates it through inputs.

Using the concepts of responsive design, plan a user-friendly 10-foot interface that a user would interact with from approximately 10 feet away, i.e., couch and television.

## Design requirements

**Create wireframes that show at least one viewport of content with two views – a grid view and a single-column view.**

**Grid view:** Show options in a condensed view and should include:
  • A screenshot thumbnail
  • Movie or show name
  • User rating
  • Running time (or episode count)
  • Year made.
Grid view should allow for more items to be on screen at once.

**Single column view:** Allows for more expanded metadata.
Required in view:
  • All elements from the grid view
  • An expanded screenshot or image series
  • A brief movie summary
  • Top-billed cast/crew
  • A similar tv/film list.

**Prototype the inputs (controller):**
Design of the proprietary controller. Create at least a lo-fi/paper prototype of the controller. Show/describe how the controller will navigate:
  • Menus
  • The main interface
  • Streaming content

## See toggle functionality in action:
https://video.kent.edu/media/SKelly_10ft+Interface_Final/1_ih8q5obq

# Design Research & Considerations

Users are in a "lean-back" experience or a passive mindset. They aren't looking to do anything complicated and often hope to relax. Because of this, this design stuck to standard UI practices and strategies for this 10ft interface.

All elements must be easily navigatable on screen using a directional controller (d-pad.) Essential functions include left, right, up, down, and select.

The design must consider the text and critical on-screen actions within safe-zone margins that can vary between 85%-95% of the screen (height and width.) When designing these screens, 10ft interfaces with 1080p (and up) displays were top of mind:
  • 1080p = 1920x1080px at 320dpi
  • Simple san-serif fonts or simple system font
  • Layouts that flow within limited-direction navigation

TV screens have a "Flicker" effect due to the display's odds and even scan lines because of this, lines or borders should be no less than 2 pixels thin to prevent them from disappearing or flickering on display.

When it comes to colors, it's best to avoid using pure white (#ffffff) because it can create a halo effect. A slightly off-white (like #f1f1f1) is recommended use instead. It's also best to avoid over-saturated colors (like red) due to their strain on the eyes. Darker colors (close to black) are opted for (mimic dark mode), keeping the eye focused on the available content.

The font size was also a significant consideration for this project. Anywhere from 24px to 96px font size is recommended for 10ft UIs. No text should be less than 24px due to the user's distance from the screen.

Focus/highlight states must indicate the user's location/position within the navigable items - no ambiguity.

Some additional principles followed include:
  • Simplicity and lightweight interaction
  • Clean and simple design
  • Use of more prominent (larger) elements with considerable space between them.
  • Presenting a clear set of actions/options on the screen
  • Putting the most important content/options first for easy navigating
  • Avoiding unnecessary screen levels - make it easy to get in and out of screens

## Sources for standards, best practices, and inspiration*:
  • Cooper, Cronin, Reimann. (2014) About Face: The Essentials of Interaction Design (4th) Wiley. (Pg 564-566 - Designing for 10-foot interfaces)
  • Design and User Experience Guidelines (Fire TV) | Amazon Fire TV - https://developer.amazon.com/docs/fire-tv/design-and-user-experience-guidelines.html
  • Introduction - Android TV - https://tv.withgoogle.com/
  • Designing a 10ft UI. Designing a television user interface... | by Pascal Potvin | Medium - https://pascalpotvin.medium.com/designing-a-10ft-ui-ae2ca0da08b7
  • A Step Forward: Designing for the 10-Foot User Experience | Solid Digital - https://www.soliddigital.com/blog/designing-10-foot-user-experience
  • Re-Thinking User Interface Design for the TV Platform | by Pascal Potvin | You.i TV | Medium - https://medium.com/you-i-tv/designing-for-10ft-ceeb202c1315
  • Beyond the Toilet Paper Roll: Prototyping for 10ft - Medium - https://medium.com/you-i-tv/beyond-the-toilet-paper-roll-prototyping-for-10ft-dde17c0dc71a
  • How to Design a Smart TV Interface That Works - https://www.bsgroup.eu/blog/tips-for-ui-ux-design-on-smart-tv/
  • Designing for Television, Part 1 - https://medium.com/this-also/designing-for-television-part-1-54508432830f
  • Design Inspiration/Examples - https://pin.it/6J2lv1k

**Note:** Annotations in blue

# Grid Layout

**112px columns**

**90px margins**

**36px gutter**

16:9 ratio - 1920 wide - 12 column-grid

**①  Grid**
The categories page would adhere to a grid layout, remaining in-frame horizontally versus having swimlanes (overscan.)  Content stays within safe action & text areas.

Directional (d-pad) buttons allow you to scroll up and down, left and right through listings.

**②  Select movies**
Thumbnails would feature cover images (or a movie screenshot.) When a movie is focused/highlighted (first one by default on page load), the thumbnail will expand slightly with a thick border & shadow to signify where the user is on the page.
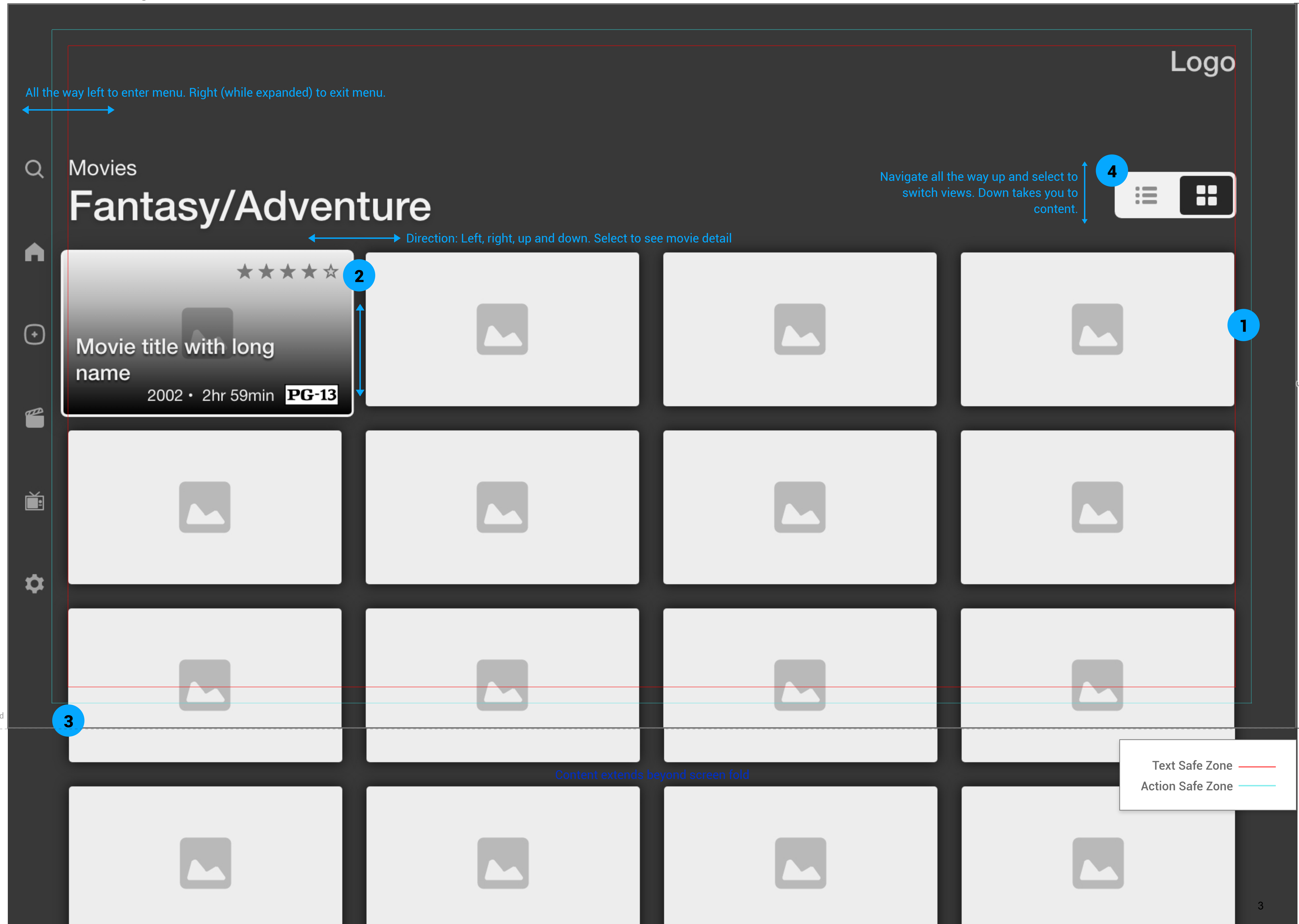
When highlighted, metadata would appear (overlaid), including:
- Movie title (name)
- User star rating
- Year released
- Runtime
- Film ratings (for audience appropriateness)

If the select button on the remote is clicked while in focus, it would transition to a details page where you could see more info, play or add to the watchlist.
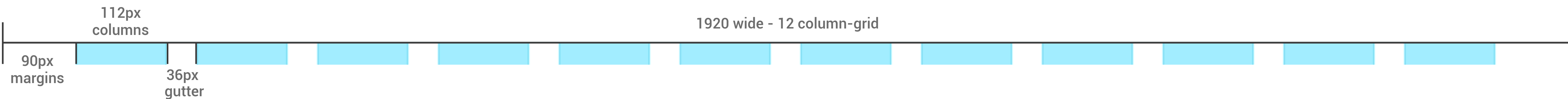
**③  Infinite scroll**
Options would scroll until all content within that category is shown. If the user doesn't want to scroll to find content, they could utilize the search function within the side menu (by arrowing left.)

**④  Toggle views**
For the user who prefers a list or perhaps more details when browsing, they'll be able to toggle their view option from the grid to list view.

Logo

All the way left to enter menu. Right (while expanded) to exit menu.

Movies
## Fantasy/Adventure

Navigate all the way up and select to switch views. Down takes you to content.

**④**

Direction: Left, right, up and down. Select to see movie detail

★★★★☆ **②**

Movie title with long name

2002 • 2hr 59min **PG-13**

**①**

1080-height

**③**

Fold

Content extends beyond screen fold

Text Safe Zone
Action Safe Zone

# Single-Column Layout

**1 Moved-up**
When toggled to list view, category headline and toggle buttons would push up to allow more space for the movie/show list.

**2 More Details**
Content is nested in a box that stretches the entire column grid when a movie is focused. The movie image gets expanded, and the additional content is displayed:
• Movie Name
• User star rating
• Year released
• Runtime
• Film ratings
• Short synopsis/summary
• Top-billed cast/crew
• Similar films

If the select button on the remote is pressed while a movie is highlighted, it will, again, transition to a details page where users can see more info, play or add to their watchlist.

**3 Expanded screenshot image**
An aesthetic feature: an image from a scene in the focused movie would fill the background (with an overlay, so all text is legible.)

**4 Additional listings**
Non-focused listings would appear in a list with a smaller screenshot and less info until highlighted. The users would scroll through these listings using the D-pad directional up and down buttons..

**5 No back button**
An on-screen back button was excluded on both views because functionality resides on the remote.*

**See toggle functionality in action:**
https://video.kent.edu/media/
SKelly_10ft+Interface_Final/1_ih8q5obq

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112px columns

1920 wide - 12 column-grid

90px margins

36px gutter

5  All the way left to enter menu. Right (while expanded) to exit menu.

Logo

Movies

# Fantasy/Adventure

Direction: Up and down. Select to see movie detail.

Navigate all the way up and select to switch views. Down takes you to content.

**Movie title with long name**

★★★★☆  2002 · 2hr 59min  **PG-13**

The future of civilization rests in the fate of the One Ring, which has been lost for centuries. A daunting task lies ahead for a hobbit when he becomes the Ringbearer - to destroy the One Ring in the fires of Mount Doom where it was forged.

**Cast & Crew**

Peter Jackson, Elijah Wood, Ian McKellen, Cate Blanchett, Sean Austin, Orlando Bloom…

**Similar films**

Tap right to select a similar movie, then up and down within this sub-menu interaction

Movie title with long name

★★★★☆  2002 · 2hr 59min  **PG-13**

Fold

Movie title with long name

★★★★☆  2002 · 2hr 59min  **PG-13**

Text Safe Zone
Action Safe Zone

1080-height

# Testing Controllers

## Contextual inquiry study
**Tested:** Competitor remotes of similar size and shape with three non-disabled participants:

• one adult male - larger hand size
• one adult female - medium hand size
• one child (age 5) female - small hand size

Observation and interviews were conducted to understand usage, behaviors, and remote comfortability.

**Findings**
•  Label buttons with icons
•  Need an easy way to get back to the previous screen
•  Placement power button out of range of the main directional functions to avoid accidental shut off
•  Direction pad, back & volume buttons should be placed for easy thumb access
•  Size of the device should comfortably fit into hands of all sizes

**Competitor remotes**



## In-person moderated testing with prototype

Tested: Clay prototype remote with two able-bodied participants:

• one adult male - larger hand size
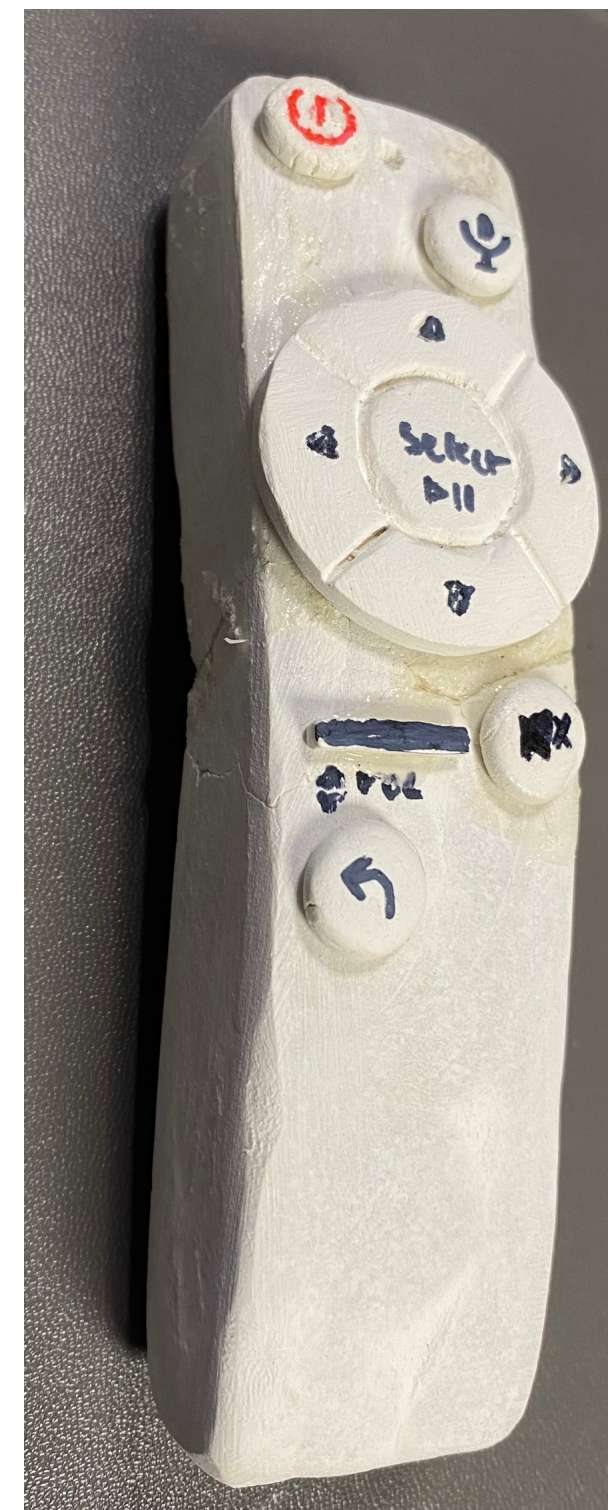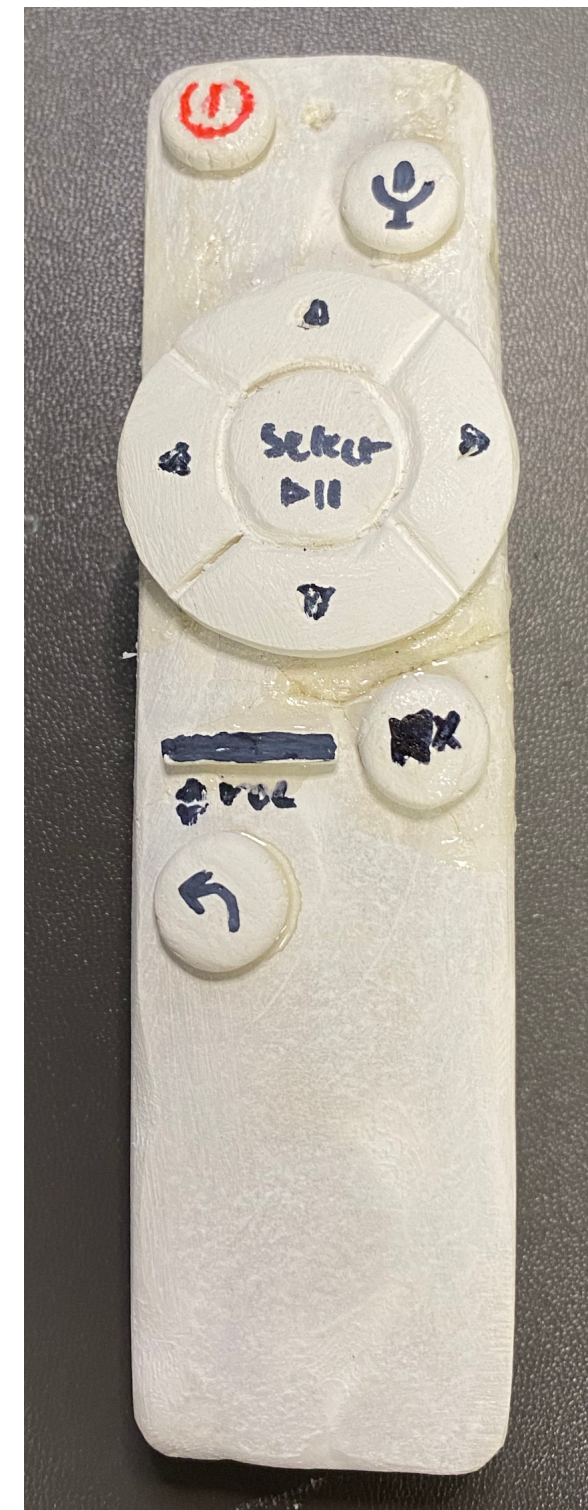• one adult female - medium hand size

**Control Goals**
•  Discover the ease of functionality - placement & understanding of buttons
•  Ergonomics - comfortability and thumb reach
•  Ambidexterity - Used comfortably by left & right-handed individuals

**Interface goals:**
•  Interpretation of how the interface worked
•  Desirability of multiple viewports
•  Directional navigation and user flows are easily achievable

**Findings**
•  Mute button is a little close (on the clay prototype) to the toggle volume, but users preferred the button location was where it was over having the volume/mute the sides of the remote so that it would work with either hand efficiently.
•  All controller functions are easily accessible within the thumb range
•  Controller was a comfortable fit within hands - no strain
•  For the UI, users did not see the reasoning for the list view, as those movie details could be seen on a dedicated page instead.
•  Users were able to successfully identify how to navigate through movie selections and access menus and toggle options.

# Controller Wireframe

**Microphone**
To speak into

Placed up top, so the user to easily
tilt up towards their mouth.

1.4"

**Power button**
Power tv/streaming device on and off.

Furthest reach as it's used less than
interface functions. It likely features a
red or green color to indicate it's to turn
the device on/off.

POWER

**Voice Control**
Press and speak into the microphone to search
(command) via voice assistant. Press again to exit
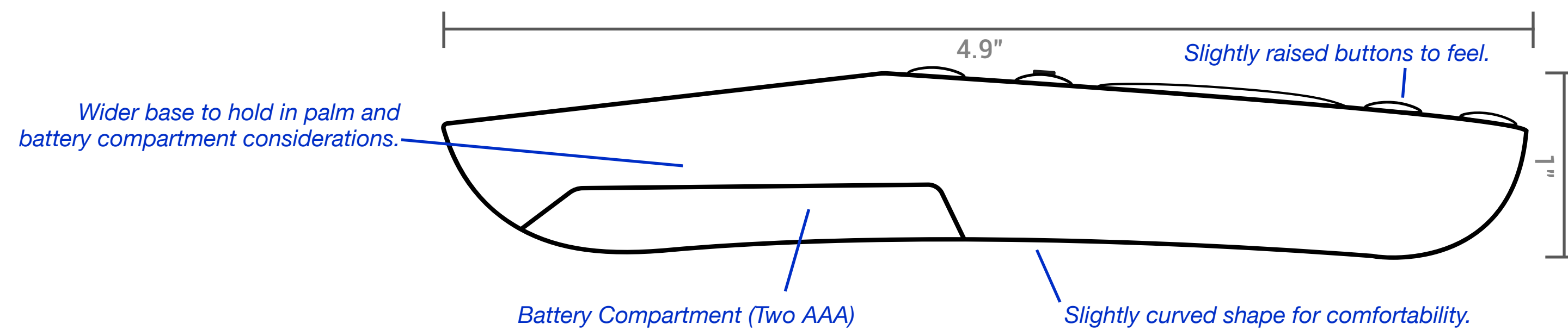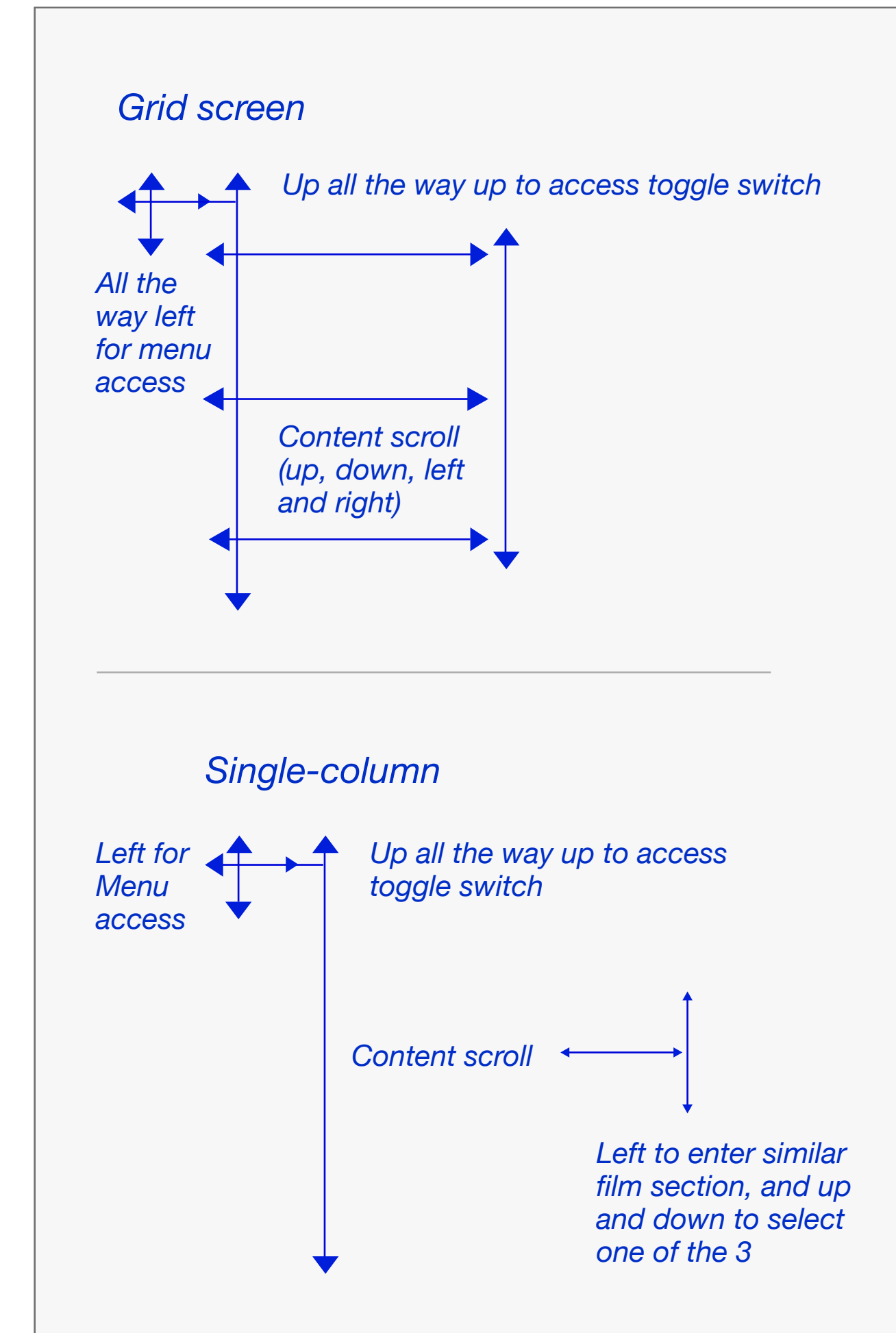voice command/search.

Placed slightly low than power button for easier
reach.

VOICE

**D-Pad (Directional)**
Allows users to navigate up, down, left, right, and
select (center button).

The select button would serve as a pause/play
button **during video viewing.** Press and/or hold
the left and right directional buttons to fast/skip
forward and rewind while watching content.

D-pad is placed more centered/middle of remote
for optimal reach and interaction.

SELECT
▶II

**Front-view**
• Simple & minimalist
• Some buttons that serve multiple functions

**Volume button**
Switch that toggles up and down
will control the tv volume output.*

When muted, press up (or mute
button again) to resume sound.

VOLUME

MUTE

**Mute button**
Quickly turns the sound off or on.

Shares a hortizontal space with volume
button as a relative function.

**Back button**
Placed lower on the remove for
quick/easy access.

Takes the user to previous
screens, home or exit the
program.

BACK

4.9"

LOGO

**Side view**

4.9"    Slightly raised buttons to feel.

Wider base to hold in palm and
battery compartment considerations.

1"

Battery Compartment (Two AAA)    Slightly curved shape for comfortability.

**D-pad trajectory**

**Grid screen**

Up all the way up to access toggle switch

All the
way left
for menu
access

Content scroll
(up, down, left
and right)

**Single-column**

Left for
Menu
access

Up all the way up to access
toggle switch

Content scroll

Left to enter similar
film section, and up
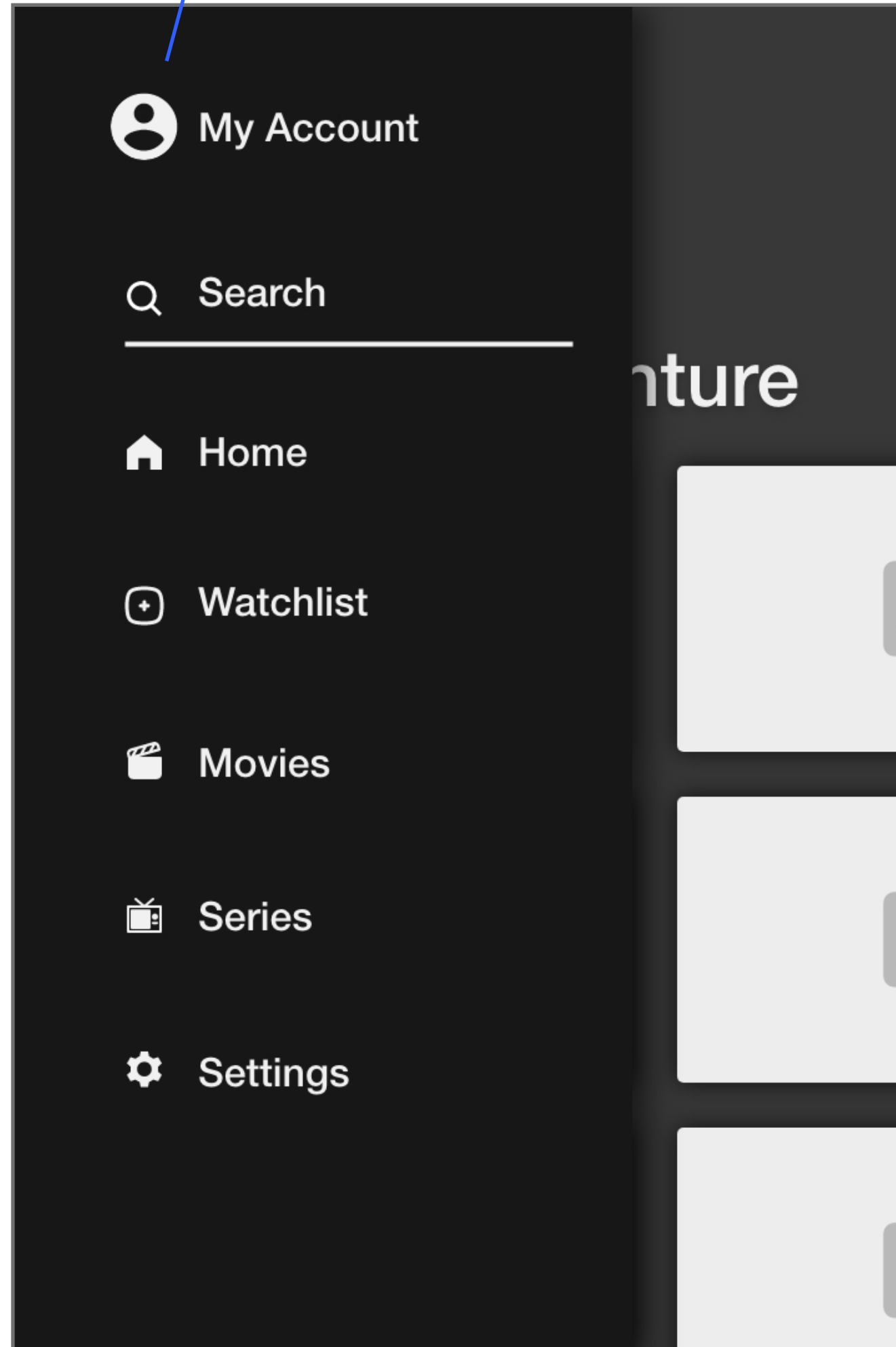and down to select
one of the 3

6

# Additional views, sketches and notes

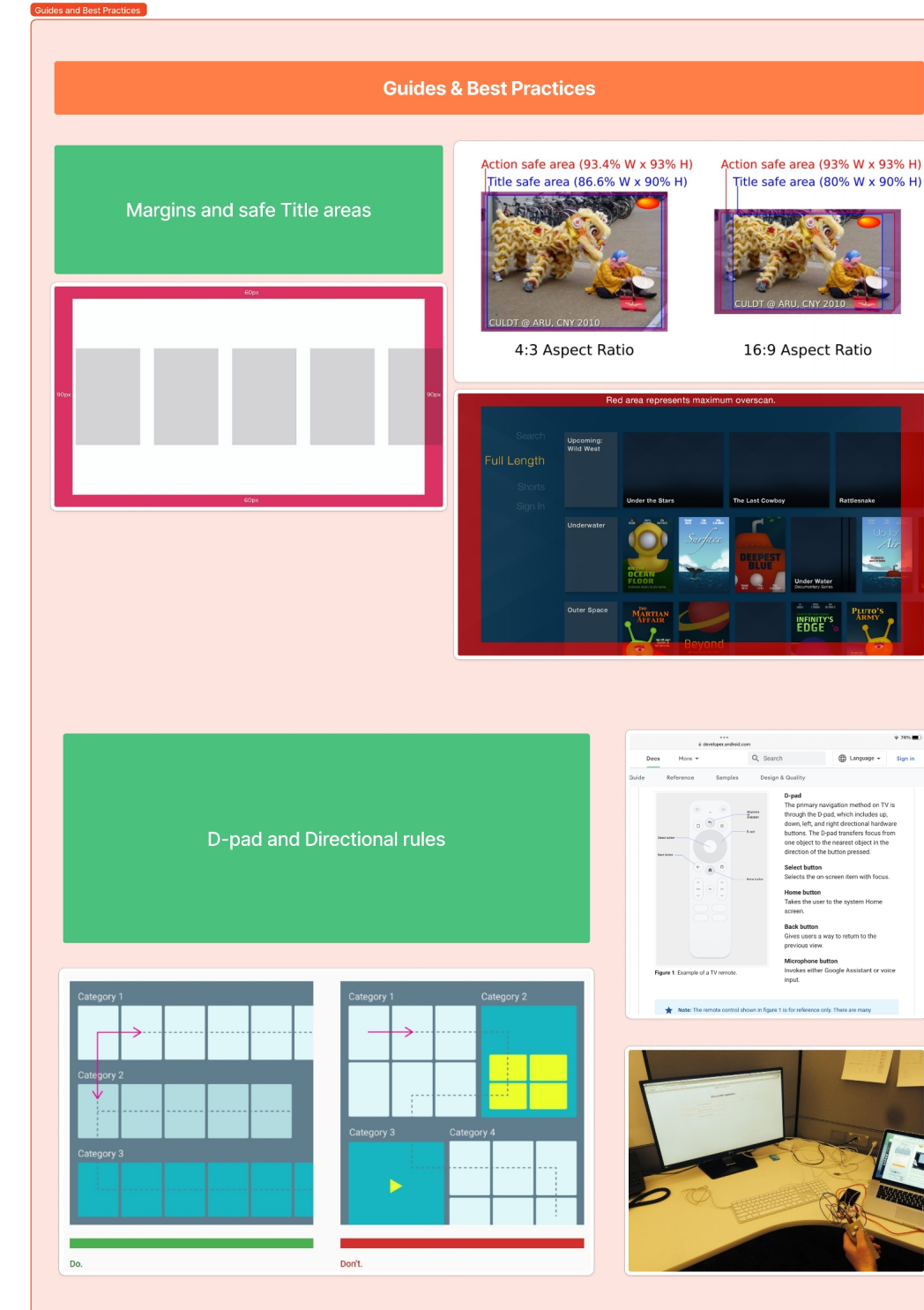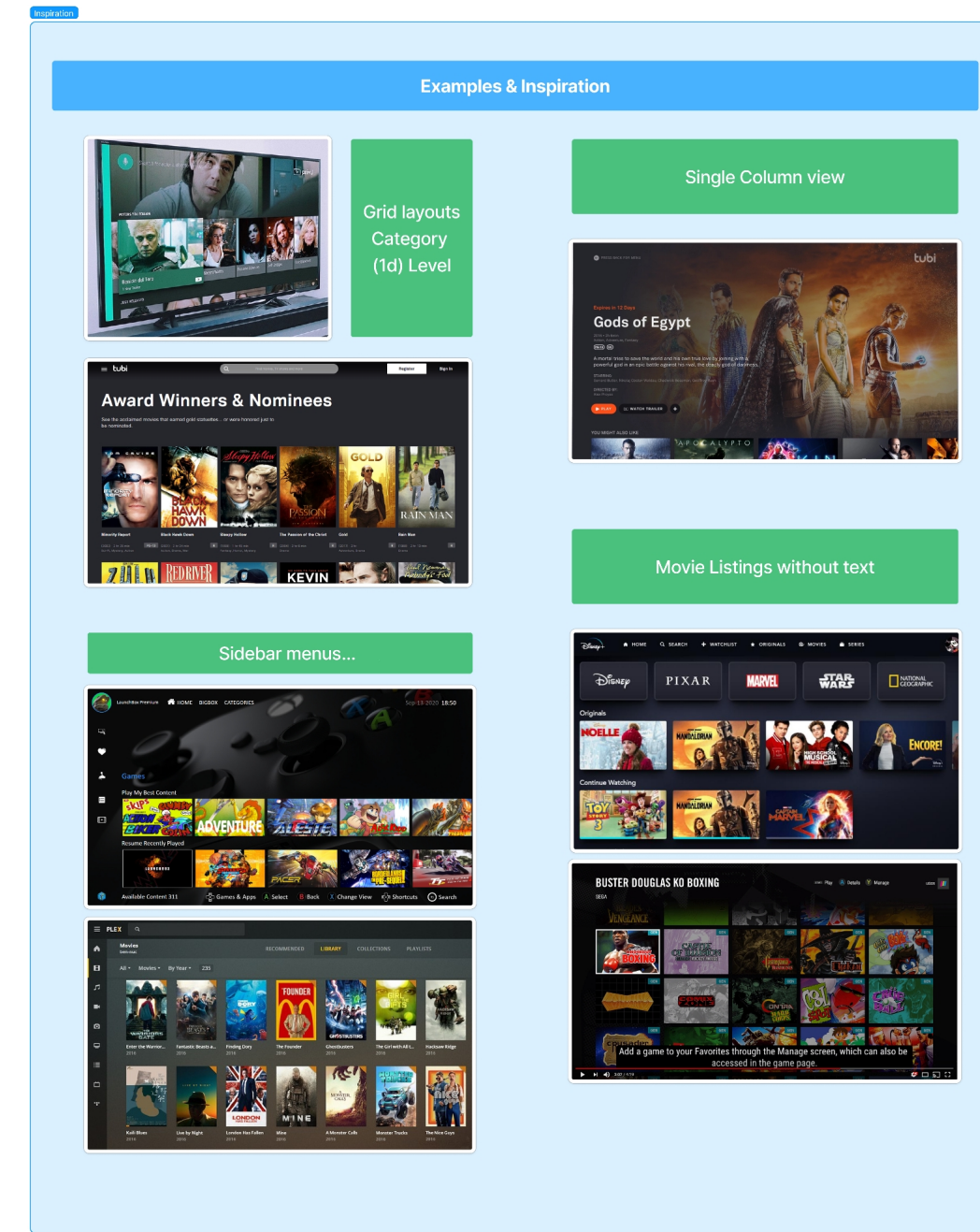Included to show process and idea iteration.

Menus functions would slide out in a drawer function. All menu options would move into the text and actions safe zone.

Account access (to switch users) would appear when the menu is expanded.



**My Account**

**Search**

**Home**

**Watchlist**

**Movies**

**Series**

**Settings**

Tap directional buttons (up and down) to access menu options.

Hit the back or right buttons to resume the current screen.



Examples & Inspiration

Grid layouts Category (1d) Level

Single Column view

Award Winners & Nominees

Sidebar menus...

Movie Listings without text

Gods of Egypt



Guides & Best Practices

Margins and safe Title areas

D-pad and Directional rules

Action safe area (93.4% W x 93% H)
Title safe area (86.6% W x 90% H)

Action safe area (93% W x 93% H)
Title safe (80% W x 90% H)

4:3 Aspect Ratio

16:9 Aspect Ratio

Full Length

*Grid - categories*

10ft UI

BATRY sports APP ? U/d device

BG graphic

CARDS?

BORDERS?
glow/shadow?
Scale larger? — when highlighted

1D list view - content level
select a category &
shows all content/format category.

1 screen worth of content
two views: grid view &
single colum

grid view - options In condensed view.
• Screenshot thumbnail
• name
• rating
• runtime (or episode count)
• year made
• multiple items on screen

Provide rationale

prototype inputs

Consider: touch capacity
• Led/small interface
• Motion sensing (wii)
• voice control

proprietary controller

10ft-paper prototype of
how it will -
• Navigate menus
• Control streaming content (pause, play as co.)

*List - categories*

Single column view



• voice expanded meta data
• all info from grid view
+ expanded screenshots/images
+ brief summary
+ top billed cast/crew
+ similar tv/film list?
+ Add to watchlist
+ play/view trailer

*Focused on wide screen formats*

16:9 Aspect Ratio



Wireframe prototype: Annotate

Controller-
Annotate• layout &
• functionality
• How its usable/
enjoyable
• easier or intuitive

• organization
of design
• How it works for
USER
• Note patterns
& Principles
used.

Annotate/Rationale — include as many
visuals as possible

4:3 Ratio -
• 93.4% w X 93% H actim
• 86.6% W X 90% H title

93% W X H Action SAFE

80% W x 90% H title safe area?

Default minimum:
• D-pad - L,R,U,D,S • Back • Home
• Power?
• mic

Annotate/Rationale — include as many visuals as possible

4:3 Ratio -
• 93.4% w X 93% H actim
• 86.6% W X 90% H title

93% W X H Action SAFE

80% W x 90% H title safe area?

Default minimum:
• D-pad - L,R,U,D,S • Back • Home
• Power?
• mic

Power
mic

Directional (L,R,U,D,S)
Volume/Channel?
Voice control activation

voice Assistant

mute

*Ideas for remotes & digital media*

controller

*Streaming unit (plug in)*

Click to category listing

Ads/promos

avenders swimlane

TRENDING CATEGORIES

LIVE LIVE LIVE LIVE

BASKETBALL

Home

Column grid?

Fold

*Homepage*

*Swimlanes were reserved for the home screen or subcategories within a main category (where applicable.)*

menu expanded

*Expanded menu*

Ambidextrity
Left & right handed

ergonomic?

Power
mic
mute

Volume