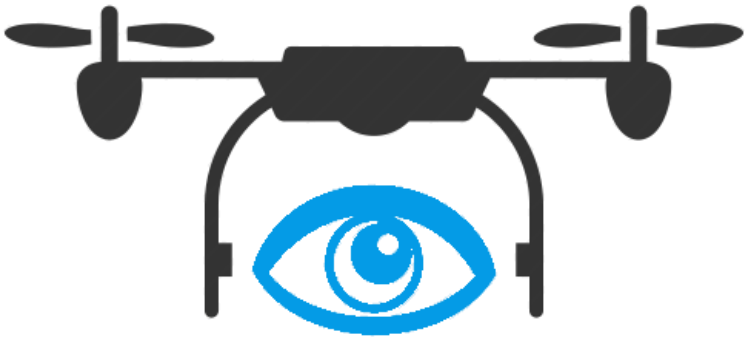
Final Project Report:

FilmSite



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A. Executive Summary

i. Application Domain

Our application domain is filmmaking. With the inherent complexity and the many different parts of filmmaking can lead to breakdowns in the field which can lead to delays in the filmmaking process. This slowdown can lead to breakdowns within the production with the different crewmember or clients becoming frustrated. Our goal is to improve the filmmaking process.

Unmanned Aerial Vehicles or UAVs are aircrafts that are used generally for military applications but now are seeing use in commercial and consumer domains. Smaller and more portable UAVs, also called Drones, are such devices that are now being used in applications such as photography, surveillance, reconnaissance, etc. The focus of our project is the use of such Drones in the field of Videography, specifically in film making. We aim to find out the novel ways in which these UAVs can be put to use to aid filmmakers and how they could augment filmmaking capabilities.

ii. Data Collection Methods

Our Project involved observing the setup, production and post-production activities that take place during filmmaking projects. This included observing all activities related to videography, light and sound, Computer Graphics, and the synchronization between all these various aspects of the filmmaking project.

We observed the behaviors of the various people involved in the activities, their routines, and the procedures that were involved. We conducted interviews to gather more information about the various issues encountered while conducting activities pertaining to filmmaking. The constraints they had to work within were of importance to us. The observed environments consisted of film sets, office spaces, and Post Production facilities that had computer workstations.

iii. Data Analysis and Design Ideas

We took note of all the artifacts used, and the methods involved with using them. Contextual notes were taken, and diagrams were made, which were then consolidated. Based on the information gleaned from the aforementioned diagrams, we envisioned certain designs and a storyboard was created collaboratively.

Along with the storyboards, we came up with a cohesive vision of the complete system. Storyboards were slightly modified as the design process progressed. A low fidelity prototype was created on paper, based on the storyboards. The low fidelity prototype was a series of sketches. Based on these sketches, a high fidelity interactive prototype was created. It is based on a mobile paradigm but can be scaled to a desktop environment.

B. Project Scope

i. Stakeholders

The primary stakeholders of our systems would be videographers and filmmakers. Those interested in getting into the field of videography but lack the means or the access to advanced level equipment are considered as well. This system is also for the ones who seek to incorporate the newest technology and want new methods of filmmaking in terms of the new capabilities that this system would allow.

ii. Activities and Scenarios

In order to drive our design and help give structure to our application we came up with two different scenarios. These scenarios will also be used for user testing. The two scenarios explore two different areas of the application but both end with the 3D interactive screen. The last screen is where the bulk of the interaction will happen and will be most useful for feedback and iteration.

Scenario 1:

John is an experienced director who continually has problems with visualizing the locations based on the pictures he is given from the location scouts. He decides to use drones in order to capture the environment. When the environment is captured he is better able to view the exact shots that he can do in the space. After capturing the environment with drones, the director works with a 3-D artist to work out the shots that they will be able to do when they go to the location. He will know exactly where to place the lights. He can now get ideal lighting for the shoot by visualizing and moving them around in the 3D environment.

Scenario 2:

Charlie, the director of an action movie, wants his production crew to set up a chase scene, but there is a time constraint. He wants to be able to shoot a complex scene and different perspectives at once, but a traditional

setup of static cameras would take too long to work with. He decides to use the UAV based film technique. The film crew uses an existing 3D map of the film location to decide the way they want to film. They use the waypoint and path setting functions of the FilmSight application to instruct the drone. The drone flies along the path that is set by the film crew, time after time. The Director does not need to retake shots on account for human errors. The flight path is tweaked according to the production crew's preference, using the paths interface on the application. The Director uses the drones to take shots from different perspectives by setting different paths for it to follow for each shot.

iii. Existing Systems

The contextual inquiry that we conducted hinges upon the study of current systems, as we aim to create a solution to augment or enhance the capabilities of these filmmakers. We studied the current systems, the equipment and the usage of the same.

Currently, the system in place utilizes a combination of hardware and software to perform the filmmaking tasks. The most important hardware components can be categorized as follows:

Hardware:

- Production Crew Hardware
    - Videography Equipment
        - Cameras
        - Lights
        - Sounds
    - Sound Equipment
        - Microphones
    - Connectors
- Post Production Hardware
    - Workstation

Hardware used for filming, videography and the sound recording takes up most of the inventory. Post production hardware is comparatively limited to workstations and digital tablets for animation purposes. A comprehensive list of all the hardware and related components can be found in the appendices.

The software is found at the post production end, and includes the various editing software packages. Other standalone software tools such as mobile applications can take the place of traditional artifacts found on the film set, such as apps for the slate, and the lists of scenes to be shot in the day. Scripts are either on paper or soft copies on word editors.

The coordination between the production crew and the post production takes place through verbal communication, or asynchronous modalities such as email or messaging.

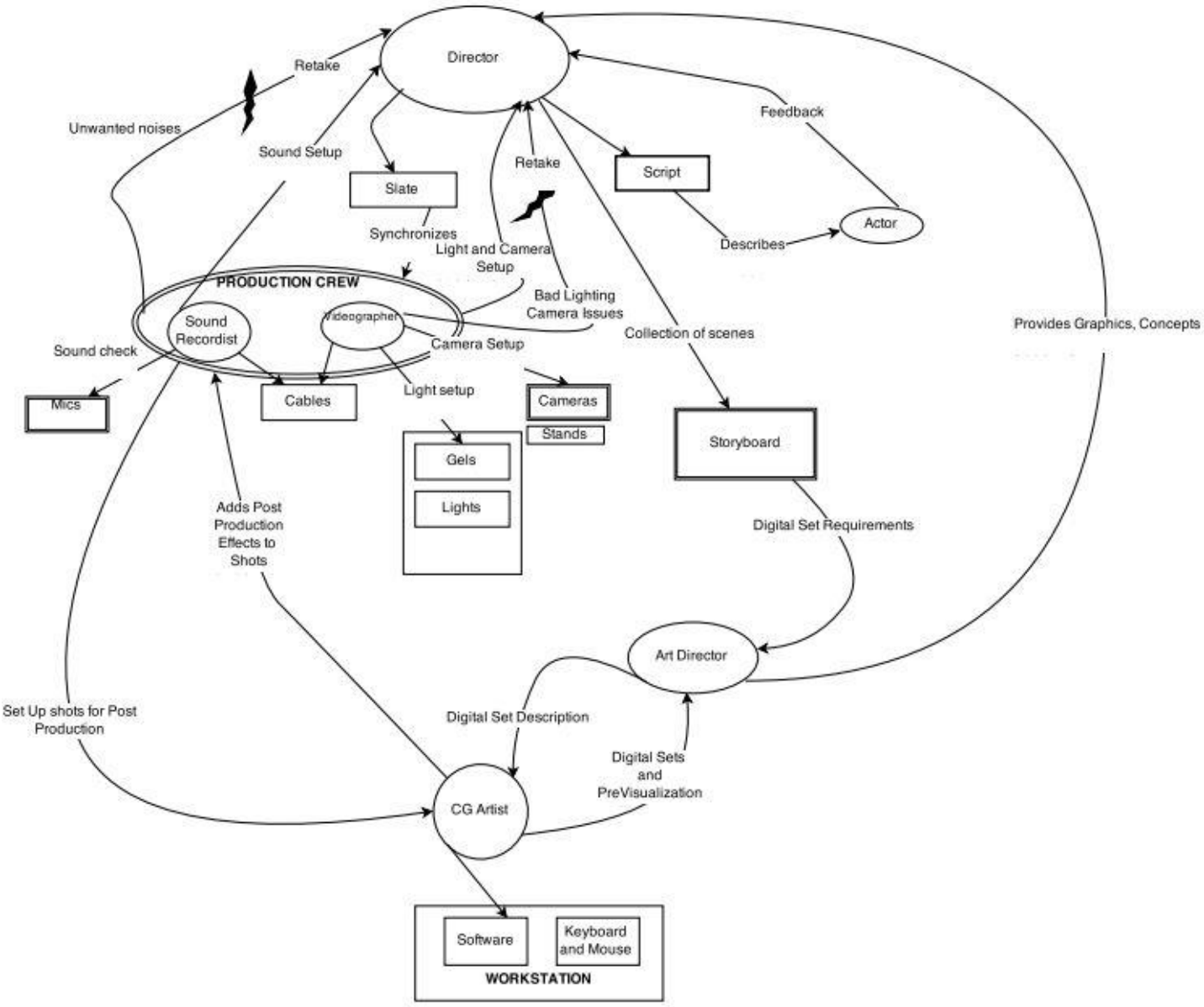
C. Consolidated Models

We used consolidated models in order to help us understand the breakdowns in the current film production workflows. These models and breakdowns identified will helped drive our design and gave us a better understanding on what types of interactions are currently going on.

i. Flow Model

Below is a representation of the coordination, communication, interaction, roles, and responsibilities of the film crew. The inefficiencies uncovered in this flow model mostly have to do with retaking a shot due to lighting, sound and camera issues. The director was responsible for identifying and implementing the re-shoot.

The Art Director is responsible for communicating the requirements of post-production editing, effects and other Computer Generated artifacts to the CG Artist, and relaying the concepts and other graphics back to the Director. Digital Sets require setting up by production crews in a fashion similar to the on-location sets.



ii. Sequence Model

The step by step process of film production is described below in the sequence model. Intent, triggers, activities and breakdowns are discussed. Most of the breakdowns identified in this model are related to setup inefficiencies related to lighting, audio and camera utilities.

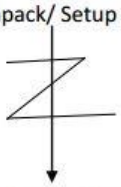
Consolidated Sequence Model

Intent: To unpack setup and organize equipment in a good location for shoot

Trigger: Arrive at shoot.

Breakdowns: Needed to re-locate in order to find ideal location

Activity: Unpack/ Setup stands and cables

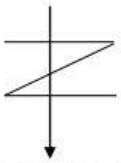


Intent: Setup sound and lighting

Trigger: Found good starting location

Breakdowns: -Needed to unplug water cooler (noise distraction)
-Needed to adjust microphone output

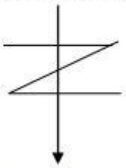
Activity: Test audio signal/ volume



Trigger: Found good starting location

Breakdowns: -Needed to re-position lighting
-Needed to adjust lighting filter

Activity: Adjust for ideal lighting

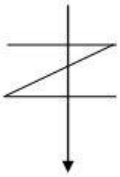


Intent: Prepare everything for actual filming

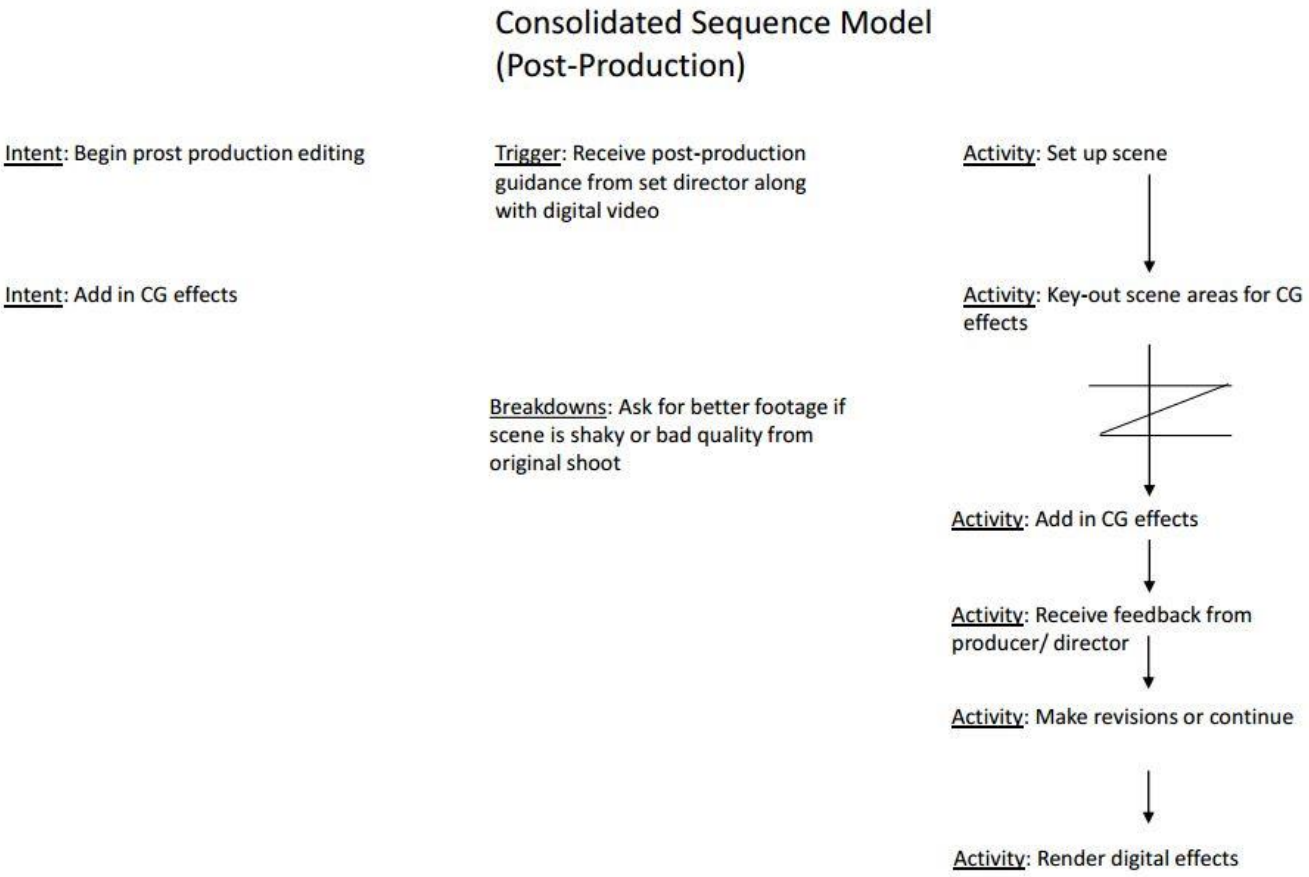
Trigger: Lighting and sound setup correctly

Breakdowns: - Power/ Battery issues with camera

Activity: Re-test lighting with Camera

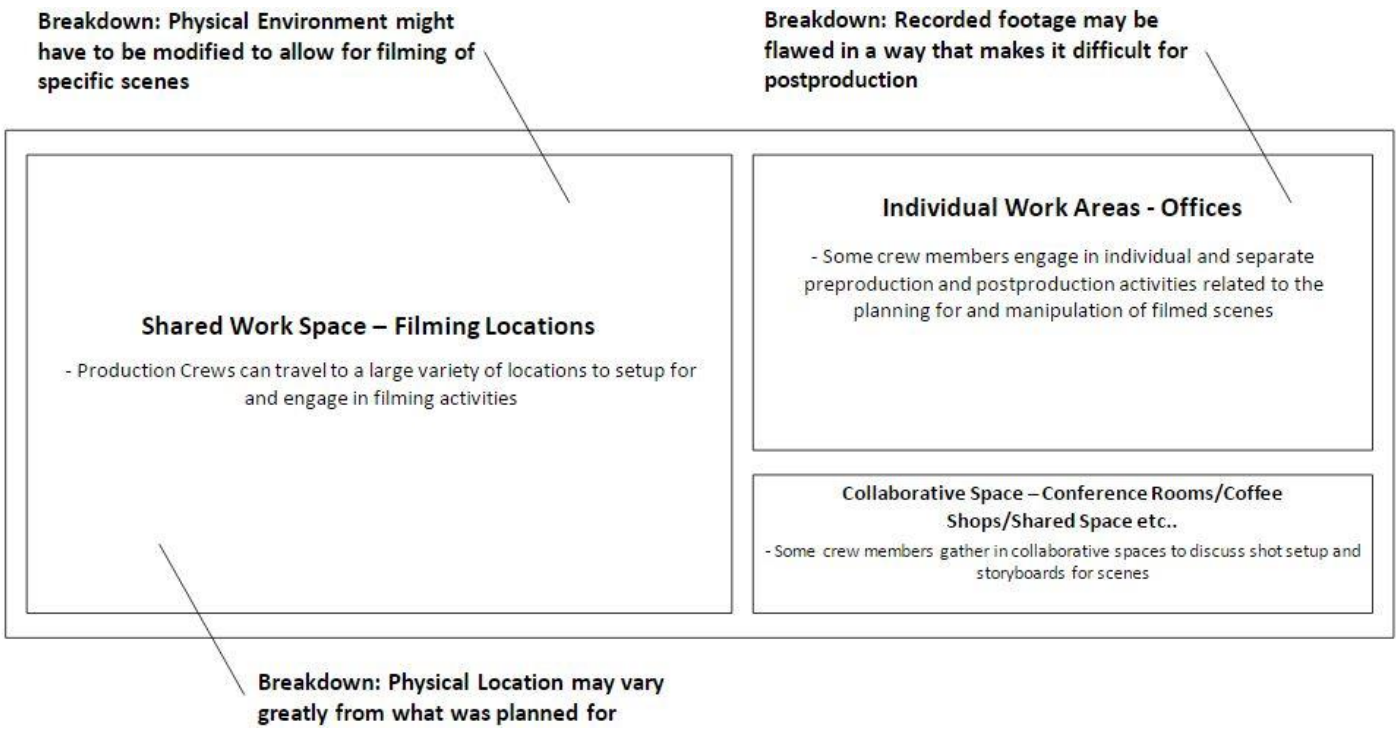


Activity: Start filming, repeat for different scenes.



iii. Physical Model

Below is a model that represents the physical environment where the work tasks are accomplished within it. Being that the physical space is ever changing on a film set, most of the breakdowns occur because of different environments and inconsistencies across shoots. This model helped us to identify that these different spaces, across shoots, could lend themselves as an opportunity for an innovative solution.



iv. Artifact Model

No artifacts were able to be physically collected during our 3 interviews. The artifacts on set were too large and did not have any significance for further evaluation outside of their environments. Some of the artifacts observed in context and on set are listed below. The artifact model gave us some insight on possible inefficiencies with using heavy equipment that requires power outlets and manpower in order to move. This gave us a little insight on how we could use drones in order to make some of these tasks less physically tedious and more efficient.

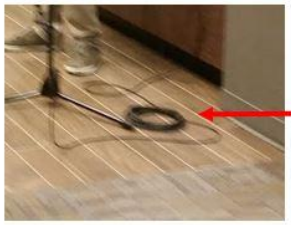
Lighting: used to augment natural light conditions

Camera: used to capture video
Breakdown: Needs to be moved manually

Stands: used to support lights and camera
Breakdown: Can be bulky

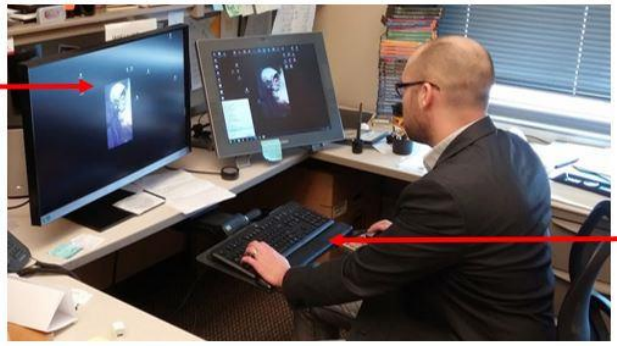
Microphone: used to record audio and test sound levels
Breakdown: Needs to be manually moved from place to place.

Slate: used to sync up sound and video in post production



Cables: used to connect and power audio, video and lighting
Breakdown: Need to reach outlets.

High Resolution Monitor: used for accurate editing.

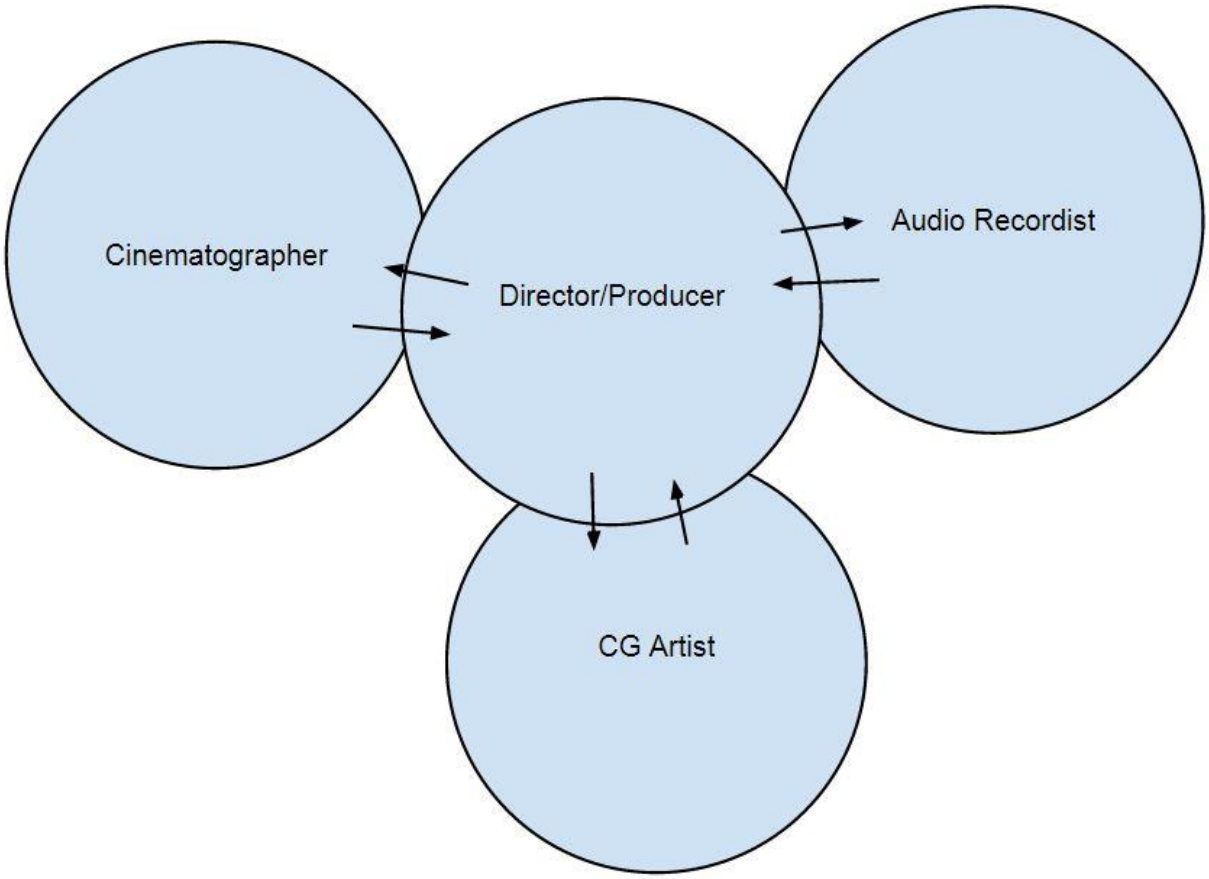


Keyboard and Mouse: used to manipulate video editing tools in post production

3D Software: used to edit and supplement video in post production

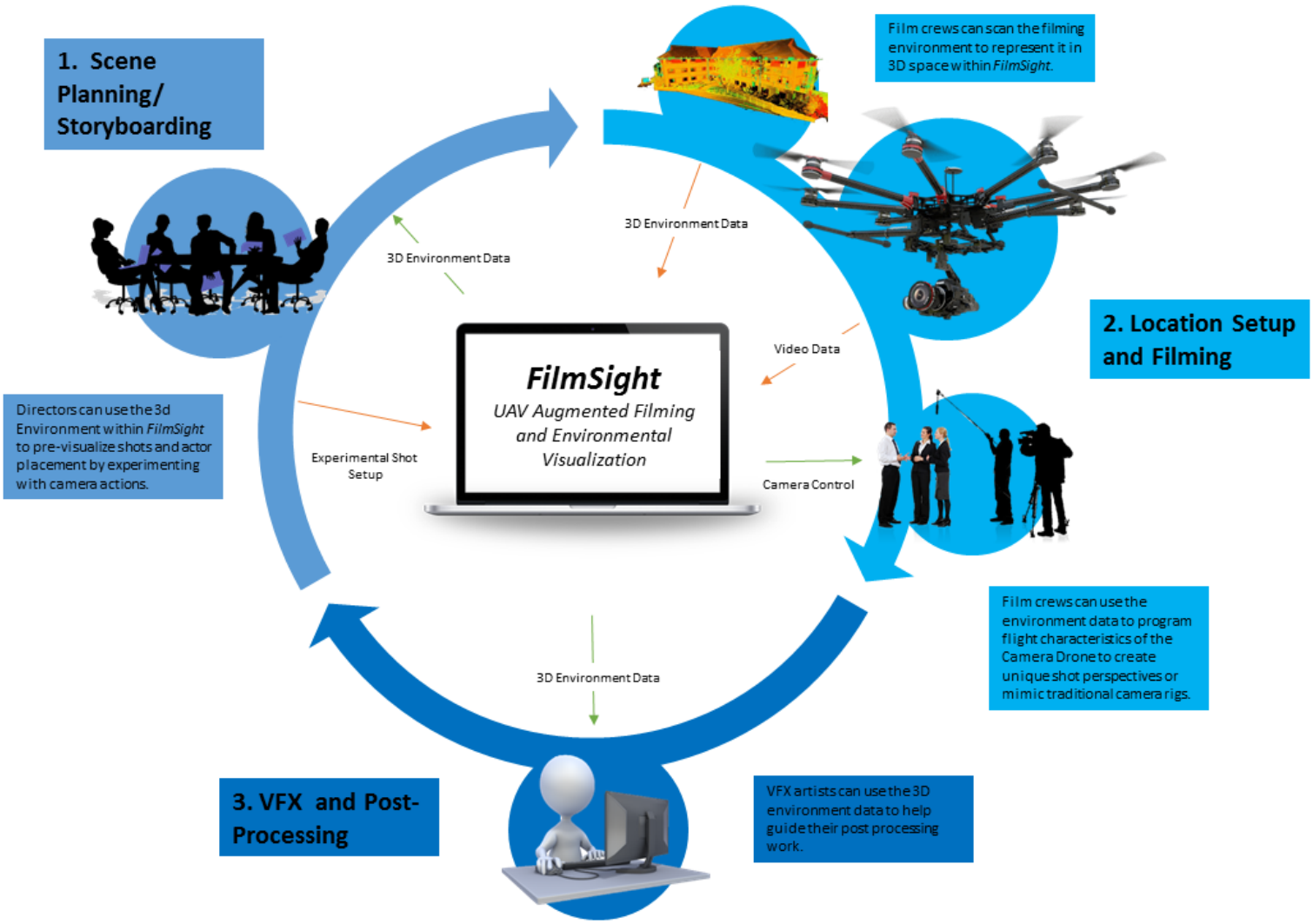
v. Cultural Model

The interactions and roles that various people play in the role of film production tend to blend into one another. Through observation we noticed that the Director/ Producer, Cinematographer, Audio recordist all took on each other's roles at one point or another during setup and filming. This seemed to be common across different interviews. The CG artist and director closely work together in order to make sure the scenes are correct for editing. The cultural model reflects this close interaction and blending amongst the film crew.

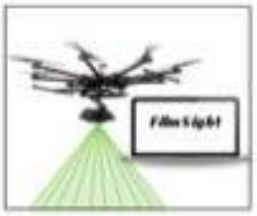


D. Vision and Storyboards

FilmSite is envisioned as a on-the-go visualization and film production tool that would allow directors, film crews, and post-production VFX designers to plan film scenes from any location, at any time that inspiration hit using a combination of real world imagery and simple mock-ups. FilmSite will allow for scene and camera planning and an instantaneous ability to share work through the application or be lending a mobile smart phone to another to view completed work.


1. Scene Planning/ Storyboarding
Film crews can scan the filming environment to represent it in 3D space within FilmSight.
3D Environment Data
3D Environment Data
Video Data
FilmSight
UAV Augmented Filming and Environmental Visualization
Directors can use the 3d Environment within FilmSight to pre-visualize shots and actor placement by experimenting with camera actions.
Experimental Shot Setup
Camera Control
2. Location Setup and Filming
Film crews can use the environment data to program flight characteristics of the Camera Drone to create unique shot perspectives or mimic traditional camera rigs.
3D Environment Data
3. VFX and Post-Processing
VFX artists can use the 3D environment data to help guide their post processing work.

The following storyboards illustrate scenarios of envisioned use:



Scene Planning

Location Setup and Filming

VFX and Post Production

In this storyboard we are illustrating the three different parts of our app. Scene Planning, Location Setup and Filming, and finally VFX and Post Production.

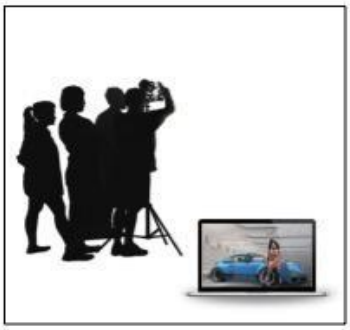
1.1 A film production crew is preparing for a video shoot by discussing upcoming activities and scene direction.

1.2 Earlier, the crew deployed a UAV with a LiDAR scanner to create a virtual 3D environment for the location of the shoot using *FilmSight*.

1.3 The director experiments with different shot perspectives and camera movements

1.4 The crew updates the script and shooting schedule to adjust for the affordances discovered in the filming location.

In this storyboard section we go through the process of how a location scan can be used to inform different crew members about the location and make creative decisions before they are in the field and have the appropriate information.



2.1. The production crew uses the shot direction saved into *FilmSight* by the Director to program the flight characteristics of the video UAVs.

2.2. The UAVs are deployed according to their programmed attributes, and are able to fly the same flight path, shot after shot, giving the production crew ample chances to get the scene right without relying on perfection the first time.

2.3 The director reviews the footage from the UAVs and makes changes to their filming characteristics using *FilmSight* to capture different perspectives of the actors in iterative takes.

This set of storyboards depicts the process of the video acquisition from both using a normal camera and by using the UAV as the means of video acquisition as well. The team knows exactly what the director wanted and shows the app being used as the means for playback for the director.

3.1 The VFX artist is ready to get started on post-production effects work.

3.2 The receives the scenes requiring post-production work, and matches them up with the 3D environment data provided by *FilmSight*

3.3 The Environmental data allows the VFX to do precise motion tracking, using the UAVs telemetry, and the account for physical objects within the scene, but not accounted for in the footage. This allows the VFX artist greater replication of realism and continuity.

This group of storyboards depicts the VFX artist receiving the information from the app to make his job easier since the app has captured a lot of information that the vfx artist would be able to use.

E. Conceptual Design

i. Metaphors

Being that “FilmSite” is an application that has to do with the domain of film production, we wanted to use keywords that are relevant and understandable to the users in the industry. Some key metaphor words include: “Camera Rig”, “3D space”, “Pre-visualization” and “FIlming”. Although these words do not actually represent what the word means like “Film” in “Filming” they are familiar to the users of the domain and make more sense than using a correct term to identify the actual interaction.

When focusing on the button and icon choices we used simple shapes that represent lights, sound and camera. We used a light bulb, microphone and vintage film camera shape. These are universal symbols that are easily recognizable to users of our application and remain relevant no matter what new light, sound and camera technology becomes available. For editing we used a scissors symbol in order to universally convey this type of interaction. In our interactive 3d environment section we use the light bulb and camera icons to represent the type of item you are moving. When changing views, we use 3D cubes in order to represent different angles in a clear and easily understandable way. Although these metaphors do not exactly represent what their function is, they are more universally understood and lend themselves to our design in a positive way.

ii. Key Features:

- Easy access menu/ large buttons
- An interactive flexible 3d work environment
- Separated but connected workflows for different types of users
- Easy access to a scanned 3d Environment
- Library of environments and easy access to previous setups
- Customized profile options for more relevant information
- Mobile application for easy access

Our Team used a User Environment Diagram in order to implement our conceptual design. We decided that our Home Screen would lead to 5 different areas in the application depending on what the user would like to accomplish. The application would have Location Scanning as a primary function in the application and therefore would be the first option on the list. There would also be three more specific options: Pre-Visualization, Filming and VFX/ Post Production for different crew members and areas of concern on the set. Our application would also have a menu so the user could change profiles or general settings. After the main areas of the application were decided, we dove further down into the various interaction types as shown in our UED. All of the areas are able to pull the scanned 3d environment loaded in the "Location Scanning" area from a library. This design allows for easy access for whatever context you are in. The design, as a whole, allows for easy navigation between all areas of the application, and each part of the application.

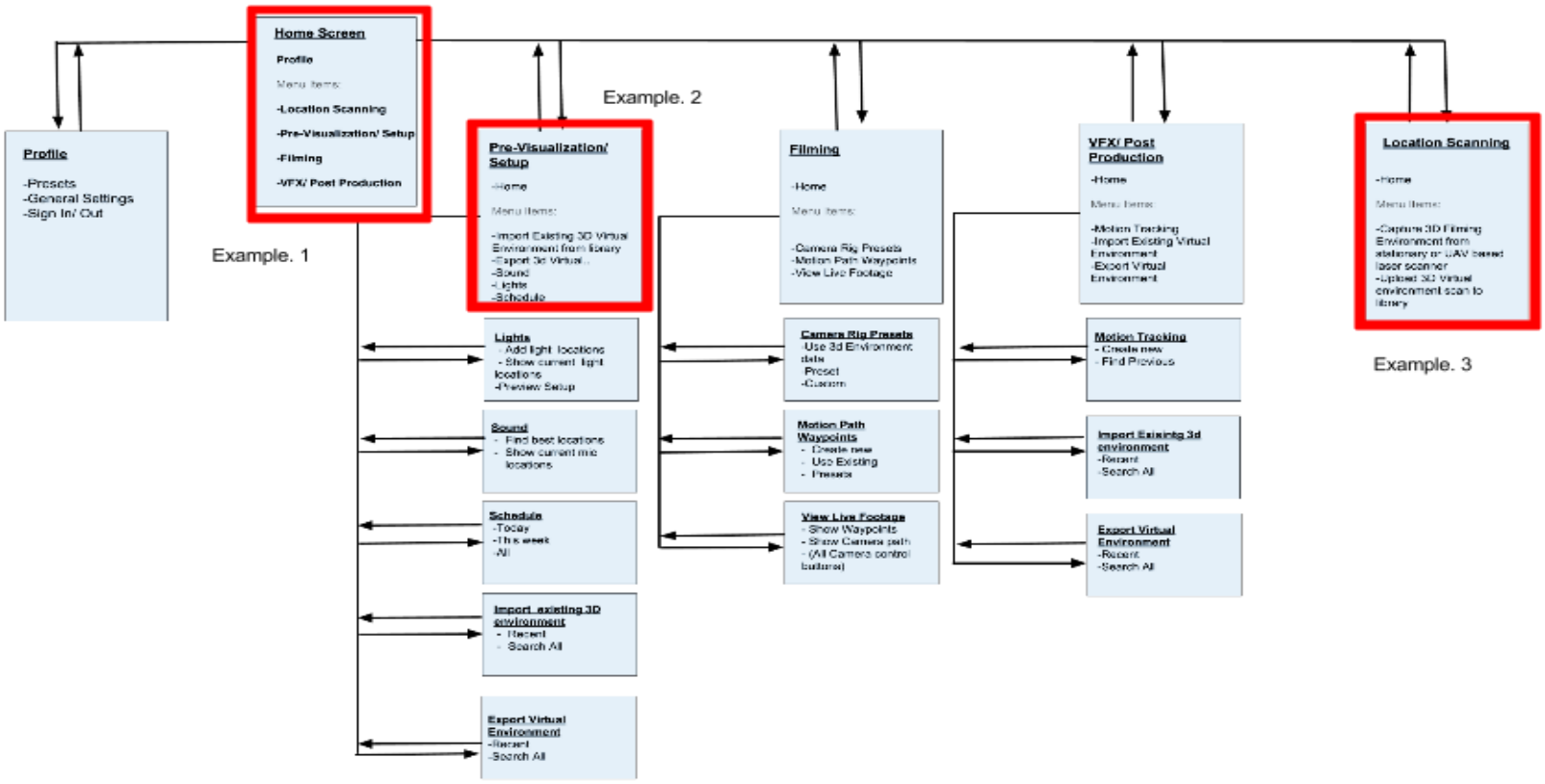
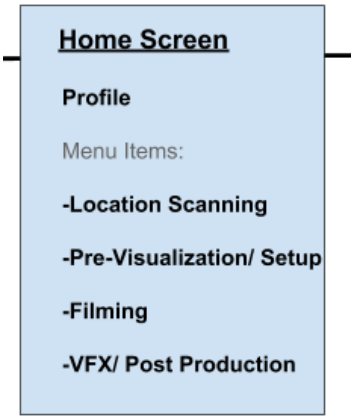


Figure: UED

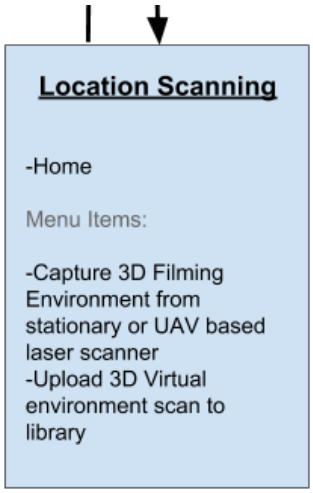
There are three levels of interaction with the Filmsite application. The levels include: 1. Home 2. Subsections from Home and 3. Actionable options from the sub-sections. All of these sections lead to the workable 3-D

environment. We decided to have no more than 4 button options on any one of the menu pages for easy selection and implementation.

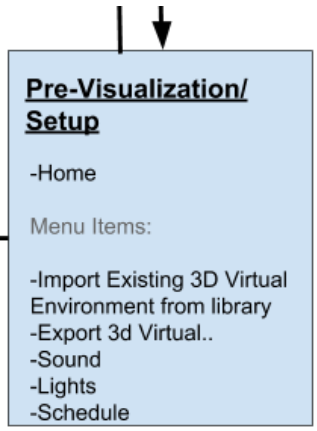
Example 1: The “Home” screen design is a good example of a four menu layout with a supplementary profile/settings area. We decided to separate the menus for easy access depending on what type of role is using the application. Only relevant information for that particular film role would be on the following screens.



Example 2: The “Location Scanning” area of our design is on the second level of interaction. This is a primary area for any of the job roles that are looking to capture a new 3D environment. We wanted to keep the options simple and clear. Although the wording for the options changed in the actual prototype the longer description was used in the UED in order to explain what the button would do. In this situation we wanted 1. a simple command to capture a 3D environment and 2. A way for users to upload the environment to the library.



Example 3: The “Pre-Visualization/ Setup” area is on the second level of interaction through our design and specifically caters to directors or film crew members that want to setup anything preliminarily before actual filming begins. The options allow for easy access to scanned environments and easy access to adjustments with lighting and sound. Schedule was later reconsidered and left out of the implemented design due to irrelevance to the salient parts of our design. It also did not fit into our four menu layout.



F. Prototypes

i. Primary Functionality Implemented

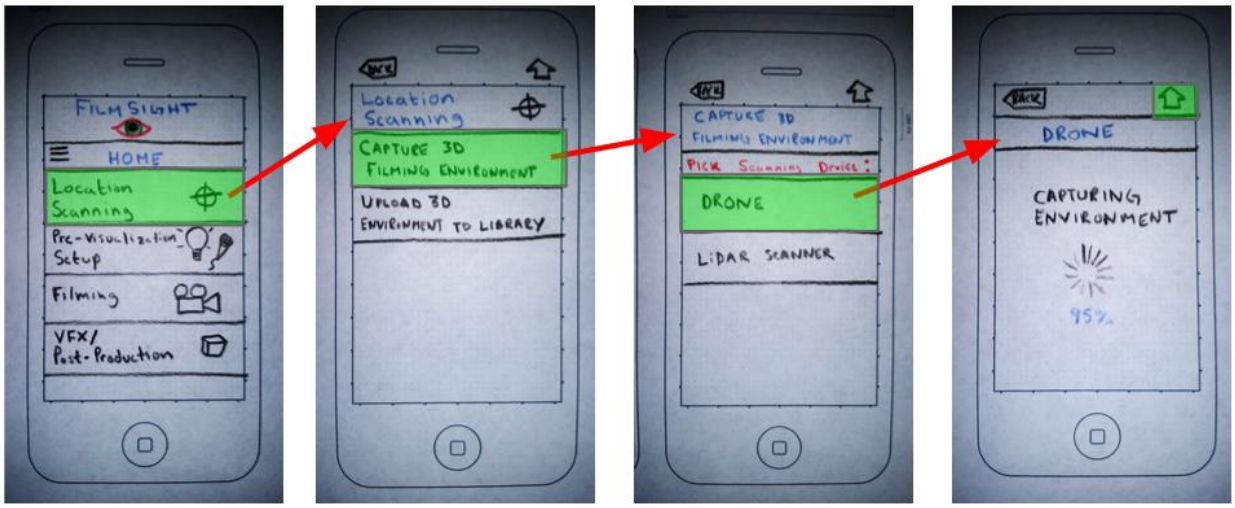
When designing our interactive prototype we wanted to make sure we focused on primary objectives and functionality to display the most salient and meaningful interactions of our product in a clear and meaningful way. We decided on designing for a mobile application being that mobile devices are highly accessible for any member of the crew, at any time. When deciding the button layout we decided that large long buttons would work better than small square icons. We decided on this because a film crew is very busy and we wanted to make it minimally cumbersome and allow for efficiency.

"Location Scanning" was implemented as the first option on the application, being that this is the primary function of our design and used by all of the crew. When creating scenarios, we wanted to have users: 1. Understand how to capture 3d environments and access these environments from other areas of the application. 2. Understand that the 3d view enables multiple types of interactions that are not limited to camera angles and adjustments. Through the interactive prototype our team was able to express these primary functionalities. We supplementally showed an interactive 3d image on a laptop touch screen. This demonstrated how the environment could be spun around and manipulated to add more depth and understanding to our static screen. Using two detailed scenarios we were able to have users work through our interactive prototype.

Our team used Balsamiq Mockups and Google Drawings in order to piece together screens for our interactive prototype. Invision was used to make our prototype interactive on a mobile device for user testing and feedback. Below we have shown two scenarios in order to present both the low-fidelity and high-fidelity prototypes.

ii. Low-Fidelity Prototype:

Scenario 1:

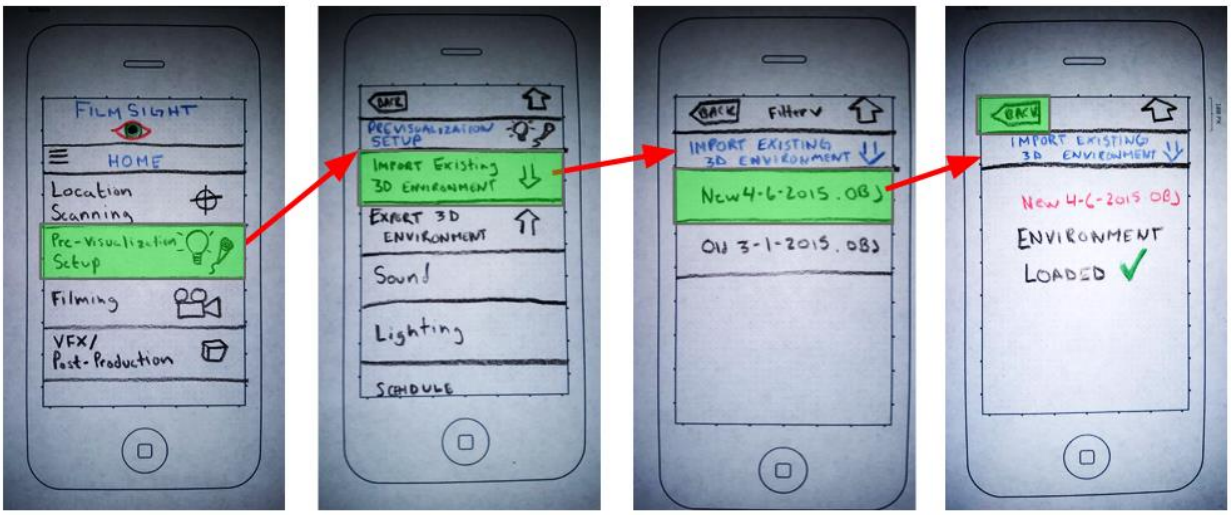


1. Select Location Scanning

2. Select Capture 3D Environment

3. Select Drone

4. Capturing/ Back to Home

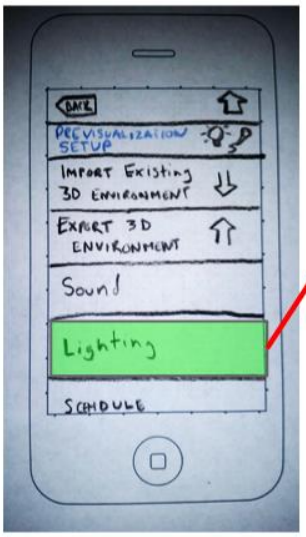


5. Select Pre-Visualization

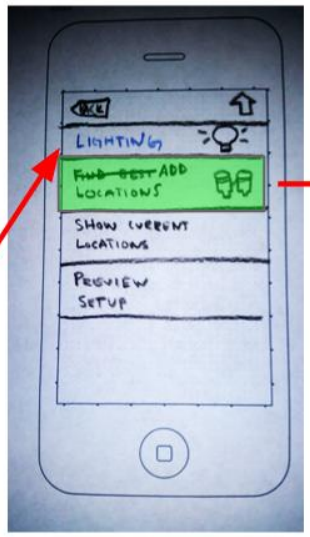
6. Import Existing Environment

7. Select Environment

8. Select Back to get to Pre-vis menu



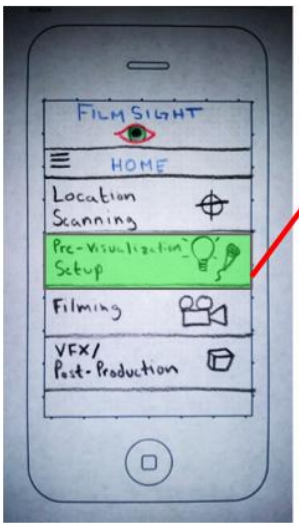
9. Select Lighting



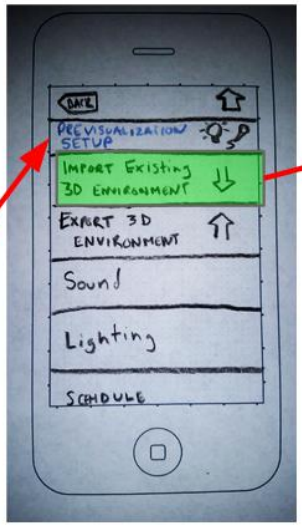
10. Add (Light) Locations

11. Adjust lighting locations

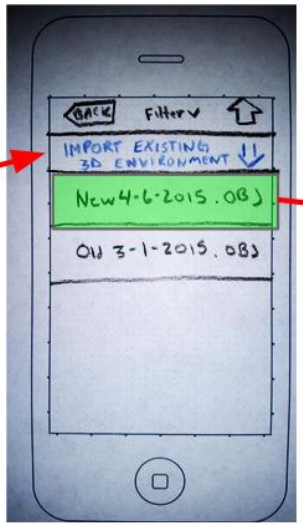
Scenario 2:



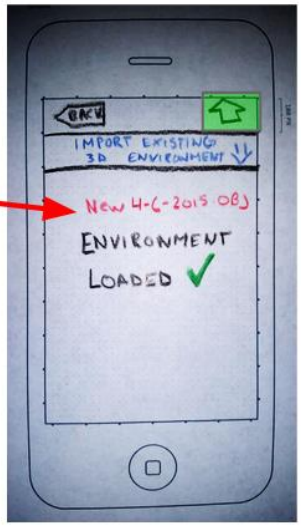
1. Select Previsualization/ Setup



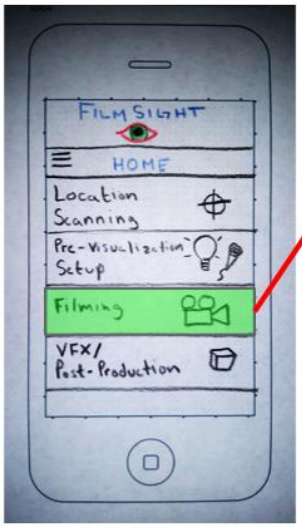
2. Import Existing 3D Environment



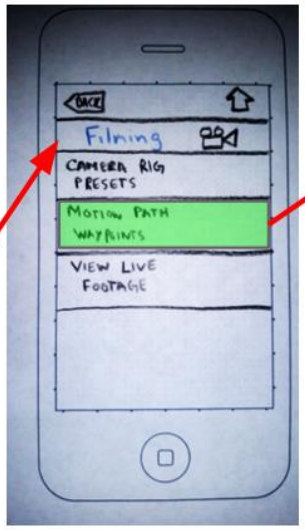
3. Select File to Import



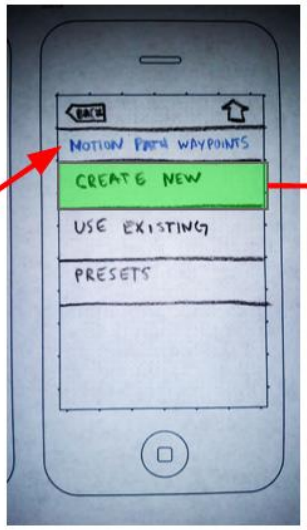
4. After complete, go back Home



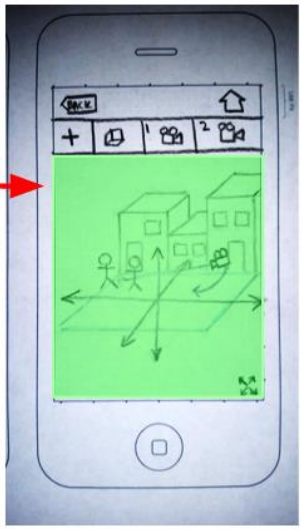
4. Select Filming



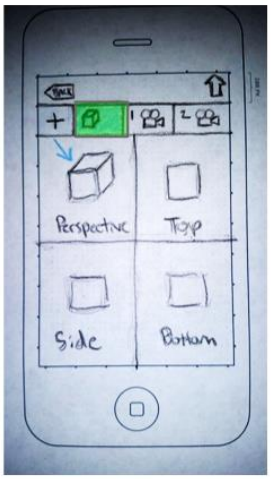
5. Select Motion Path Waypoints



6. Create New



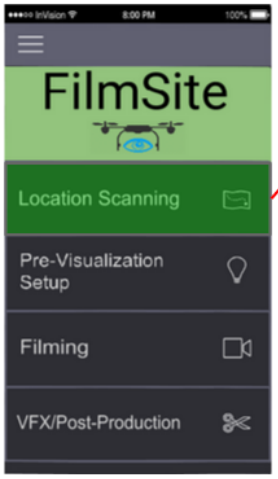
7. Adjust Waypoints



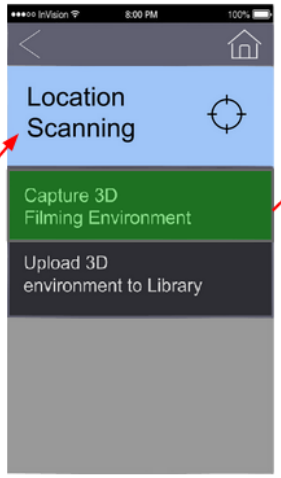
9. Adjust View

iii. High Fidelity prototype:

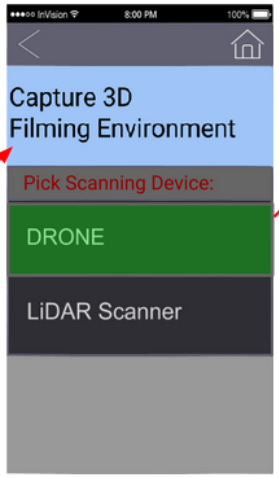
Scenario 1:



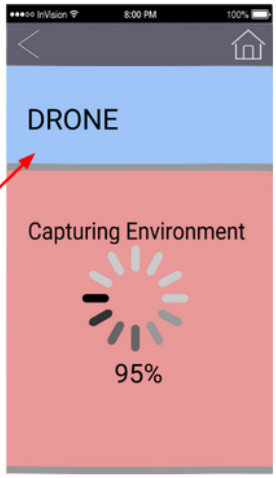
1. Home, Select location scanning



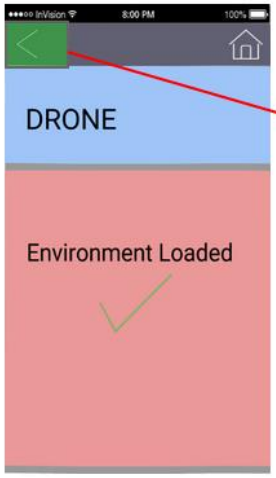
2. Capture 3D Filming Environment



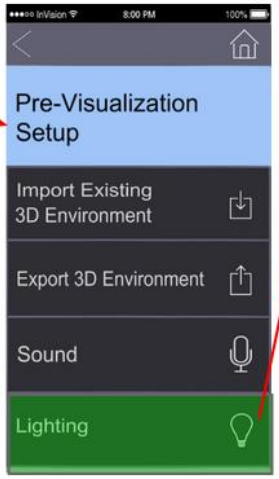
3. Pick Drone Scanning Device



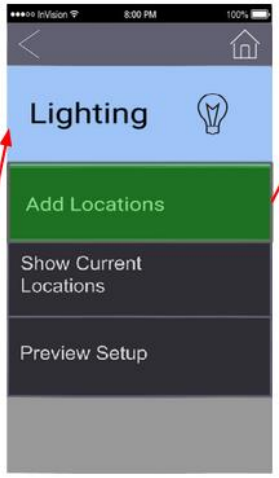
4. Capturing Environment



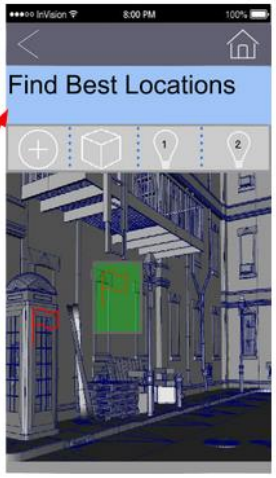
5. Back to Pre-visualization



6. Lighting

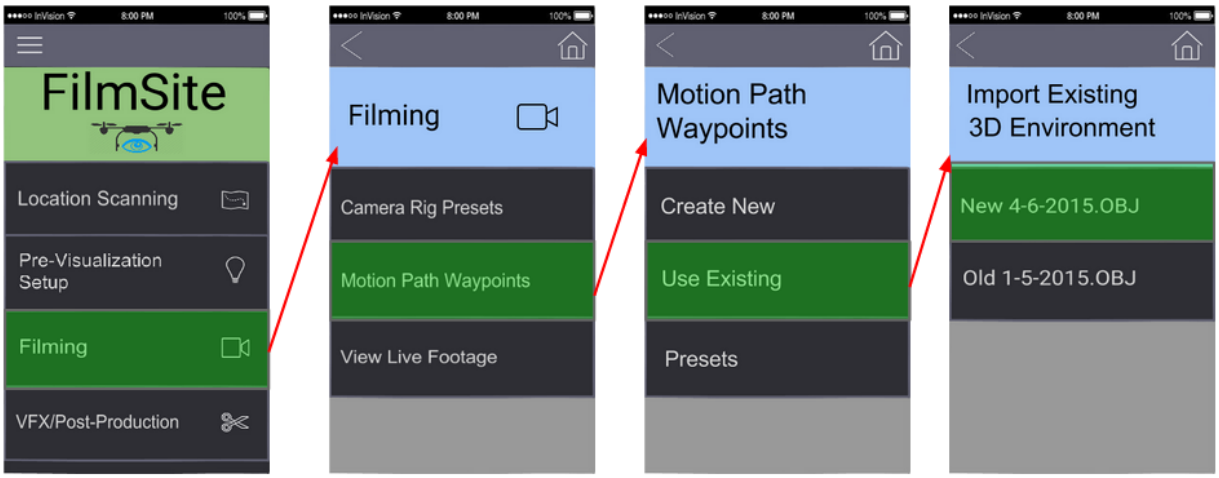


7. Add Locations



8. Manipulate Locations for Lighting

Scenario 2:

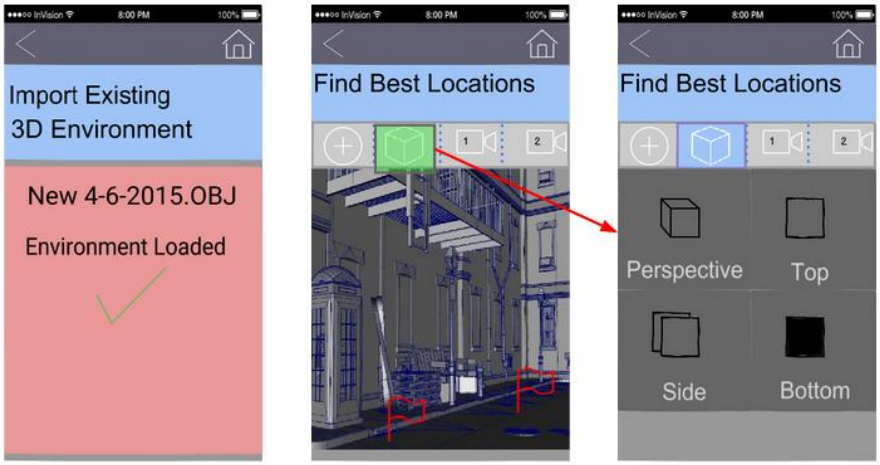


1. Home, Select Filming

2. Select Motion Path Waypoints

3. Use Existing Waypoints/ Environment

4. Select Existing Environment



5. Successful Load Screen/ Map opens

6. Select View Option

7. Choose Desired View

iv. Interactive prototype:

http://invis.io/S82OVMYMY

G. Evaluation

i. Method

We walked two participants (one from a production background, and one from a post-production background) through our scenarios using the interactive prototype. We explained the background and intention of the design, and the use of 'drones' in filming. Both users were familiar in the use and ideology of using drones for the aerial capture of video. We asked the users about:

- Their overall impressions of the application
- The anticipated usefulness of the application for the user's domain area of expertise
- Film production actions that the application supports in its current context
- Film production actions that the application fails to support in its current context
- Features that would improve interactions with the application
- Clarity of the interface and use of the application's representation of virtual 3D space

ii. Strengths

Both users found the application to be compelling and useful within the domain of film production due to its inherent complexities. They appreciated the application being expressed as a mobile platform, as it would always be available when inspiration strikes, allowing directors to envision shots in wide variety of physical locations in the same way in which design ideas are often scribbled on 'cocktail napkins'.

- Users appreciated the high-level intentions of the design idea
- The 3D perspective in the pre-visualization was considered helpful
- Ability to restrict the view to specific camera choices was extremely useful for multiple shot planning
- Mobile platform is convenient for use when ideas come to mind, or you want to show ideas to colleagues by handing your phone to them

iii. Areas of Improvement

When discussing future directions for the application, both users considered their domain area of expertise to the most important area of the application, giving indication that there should be further segregation between pre and post production functionality in the application. General feedback for improvement to the interaction with the application included:

- Improved definition between sections that cater to different subsets of production (pre-production, production, and post-production)
- Add capability to review shots

- Add estimation of time remaining for sections that require processing time as opposed to using a percentage
- Filming section is considered ambiguous, as the entire application is designed for the process of filming
- Add the ability for a user to add quick notes
- The addition of a timeline for shot setups and camera operation with an ability to ‘scrub’ through quickly
- Show pre-made virtual camera rigs with editable constraints
- The exportation of the 3D environment in pre-visualization needs more clarity as to what it does
- Separate out the location scanning into its own application, or at least de-elevate its location in the hierarchy
- Ambiguity in the difference between ‘filming’ and ‘pre-visualization’ sections
- Show different angles of the 3D environment so perspectives can be seen within the prototype for better expression of the prototype's intentions

H. Future Work

After sitting down with our users and conducting productive evaluation sessions, and establishing the inherent value in our design direction we propose the following improvements for future design work:

- Continued iterative design development with increasingly refined prototypes adding increased functionality such as a timeline that the user can ‘scrub’ through, camera controls, more 3D visualization elements
- Focusing the application design and potentially breaking sections into individual applications tailored to pre-production, production, and post-production, while also segregating drone piloting features
- Eliminating category ambiguity with better descriptive titling; potentially from industry-specific terminology
- Enhancing recognition with improved iconography
- Addressing the perceived weakness in the ‘filming section with a more refined high-fidelity prototype to express the vision of ‘drone’-based camera control and scripting, 3d examples for perspective views, revised title

I. Conclusion

Our project was based on contextual evaluations of the filmmaking domain, and how the use of UAVs could be incorporated into this domain seamlessly as a new system that was easy to use, familiar and scalable. We began by conducting contextual interviews and preparing contextual models that drive our design decisions.

More specifically, we found out how the roles and responsibilities in the domain operate with each other. It was observed that there was a limit to the communication between the production and post-production roles and that led to many tasks taking longer times or re-doing. It was also observed that there were a lot of different artifacts both physical and digital. There was a requirement of keeping track of the various artifacts, and in the case of digital artifacts, the versions of the same artifact were prone to change, such as the tasks for the day, or script. We also observed that there is a lot of domain specific terminology used in filmmaking that we would have to consider. We used this terminology for the design metaphors, and it received positive feedback from the evaluators.

The next stage was the visions and storyboards. Based on consolidated diagrams and the affinity diagram, we figured out the key scenarios that our application would address, which were relevant to our problem space within the domain. This was the basis for the low fidelity and high fidelity prototypes.

After creating the prototype it was evaluated by professionals from the field. We received valuable feedback. It was observed that the feedback provided by the evaluators was highly specific and pertained to their areas of expertise. We will be modifying and developing this prototype based on the feedback received for subsequent iterations.

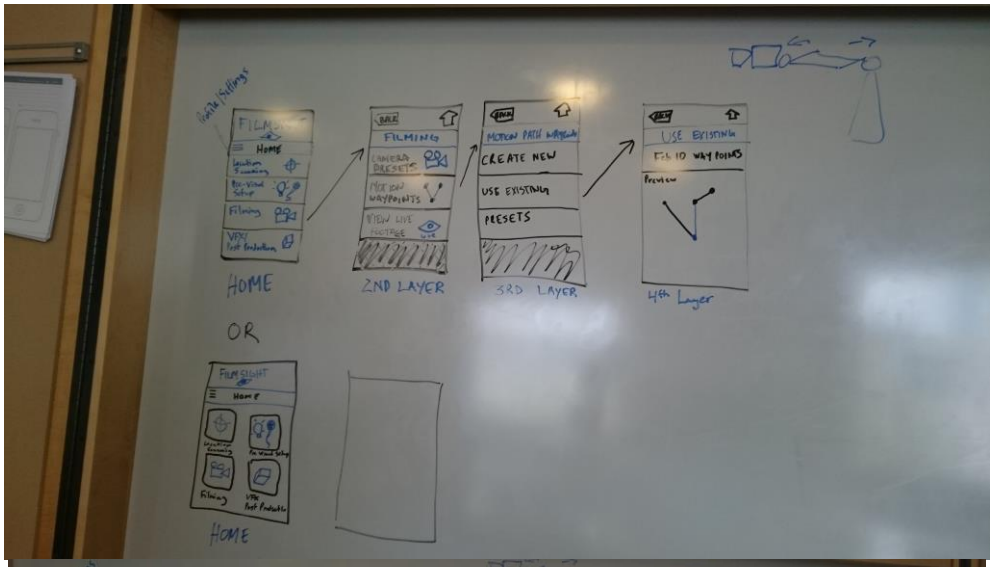
J. Appendices

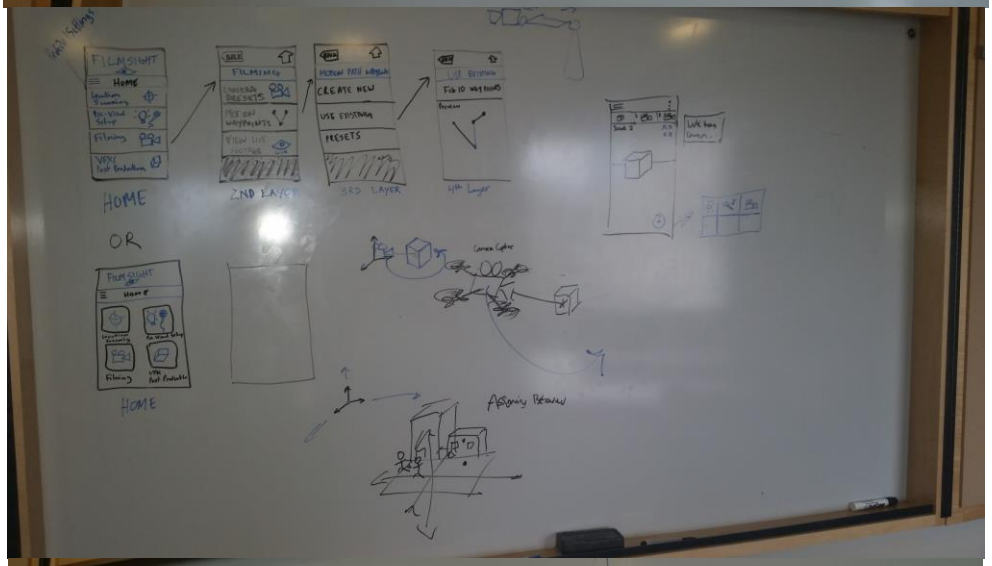
Embedded 3D Supplementary Environment

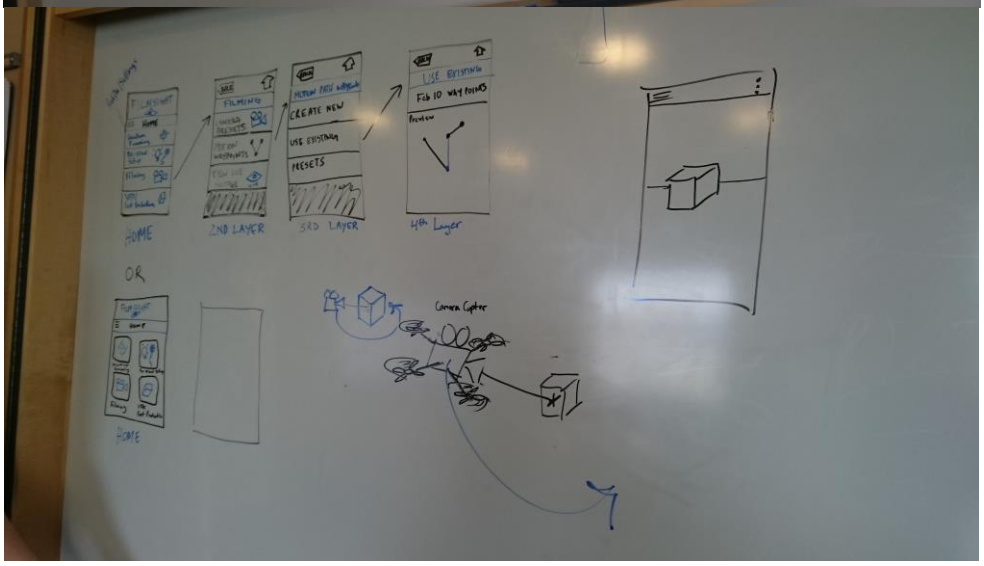
This environment was used to demonstrate the functionality of the 3D environment part of our application.

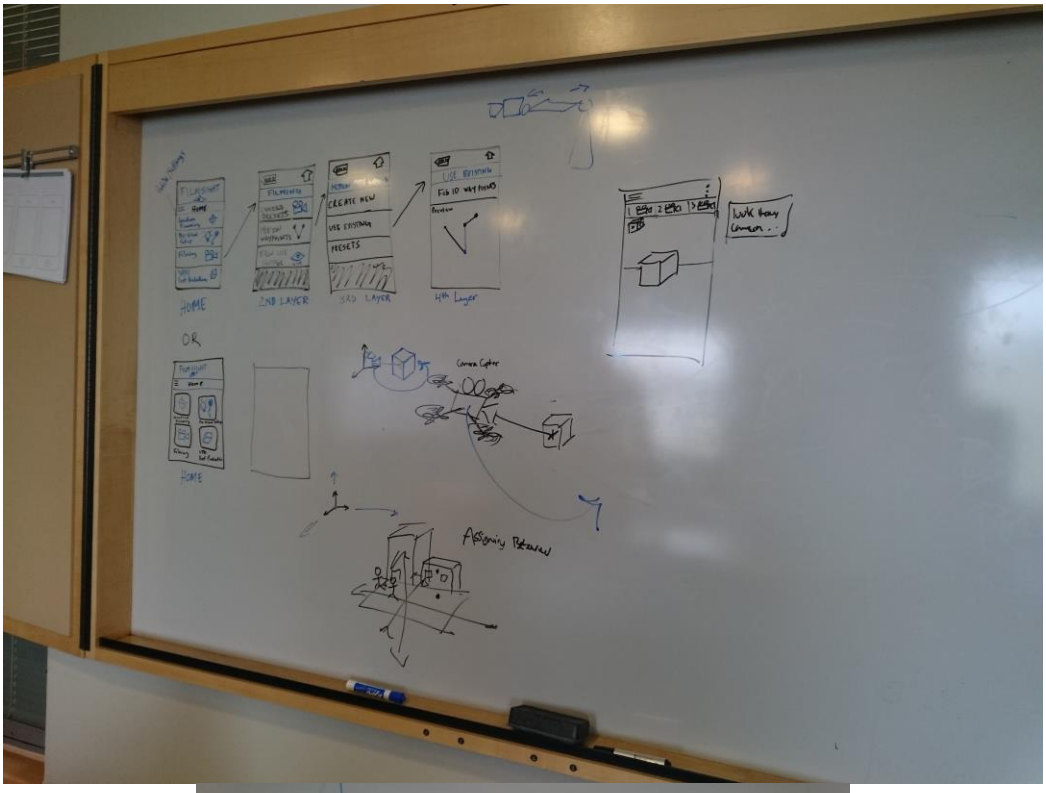
http://p3d.in/Cadwc

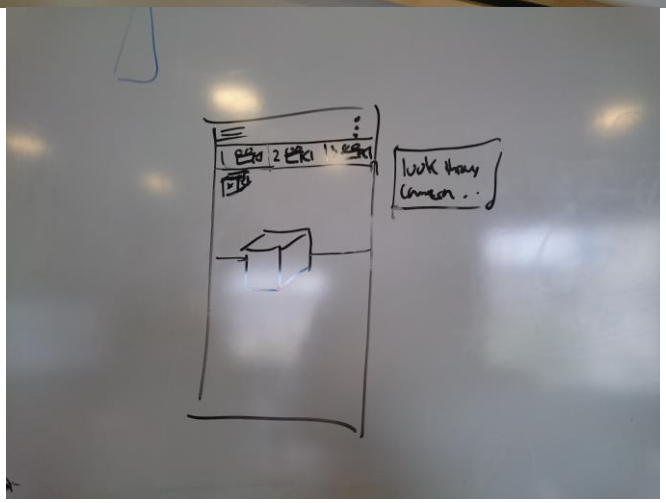
Sketches


FILMING
CREATE NEW
USE EXISTING
PRESETS
HOME
OR
HOME
2ND LAYER
3RD LAYER
4th Layer


HOME
OR
HOME
Camera Gather


HOME
2ND LAYER
3RD LAYER
4th Layer
CREATE NEW
USE EXISTING
PRESETS
OR
HOME
Camera Gather





Interactive Prototype

http://invis.io/S82OVMYMY

User Feedback

Notes from Zeb:

Overall our participant was pleased with what are application was capable of. There were a few areas of concern including confusion about what a couple menus may or may not do, including thinking the filming menu was not necessary. There was a lot of praise on a new affordance this type of application can be used including for quickly looking at scenes in bed before coming onto the shoot.

General Feedback:

Ease of use: 8

Usefulness: 10

Amount of options.

Suggested to check out “Joust” application (used in Hollywood; created by ‘Creative Cartel’)

Pre-vis and VFX post production ARE MOST IMPORTANT.

Filming is the weakest category

Suggested quick editing, camera planning, timing and being able to edit multiple recording.

Quick notes and set picture.

Could use timeline transition on map.

Maybe drone version in Pre-vis may have 3-axes.

Show pre-made arc (camera1, camera2 transition etc.)

Flying drone camera would be good in 3d view

Praise:

Likes the restriction on different camera choices.

Perspective in pre-vis is good.

Constructive Criticism:

Export 3d environment in pre vis? (What does this do?)

Does not know what “filming” does. Maybe call it drive and record.)

Wants to know more about Post production.

Possibly separate location scanning.

“What is the difference between filming and pre-vis?” – Original thought. “3D pre-vis may work”

Potentially move the location scanning to the bottom of the main menu (de-elevate)

Add ability to append notes/photos for design ideas and inspiration

Add a timeline to “scrub” through when camera movements/animations are setup

Change the ‘Term’ Film in the menu to something more like “drive and record”.

Show different angles of the 3D environment so perspectives can be seen (prototype recommendation)

Notes from Sheheryar:

Feedback:

Would be good to have an estimated time remaining instead of percentage.

Would like to see what’s in the vfx/ post production area on our design

Pre visualization should be changed to pre-production or something more clear

Would be nice to review shots

Would be nice if the screens were clearer defined between pre-production and post-production

Ease of use: 7

Usefulness: 9

Scenarios

Scenario 1

User a is an experienced director who continually has problems with visualizing the locations based on the pictures he is given from the location scouts. He decides to get his location scouts to use drones so that he is better able to view the exact shots that he can do in the space. When the location scouts are finished the director works with a 3-D artist to work out the shots that they will be able to do when they go to the location and he will know exactly where to place the lights. He can now get ideal lighting for the shoot.

What Director Does:

Home→ Location Scanning→Capture 3D filming environment→ Upload to Library

What 3D artist does:

Home→ Pre Visualization→ Import Existing Environment Loaded

Light→ Show current locations OR

Light→ Find Best Locations

Scenario 2

The Director of an action movie wants his production crew to set up a chase scene, but there is a time constraint. He wants to be able to shoot a complex scene and different perspectives at once, but a traditional setup of static cameras would take too long to work with. He decides to use the UAV based film technique. The film crew uses an existing 3D map of the film location to decide the way they want to film. They use the waypoint and path setting functions of the FilmSight application to instruct the drone. The drone flies along the path that is set by the film crew, time after time. The Director does not need to retake shots on account for

human errors. The flight path is tweaked according to the production crews preference, using the paths interface on the application. The Director uses the drones to take shots from different perspectives by setting different paths for it to follow for each shot.

Import Existing 3D environment

Set Motion Path/Waypoints or: Use Presets Change View

Save Path