



# CITY FABLES

S T A D S F A B U L A

Celebrating Cultural Heritage through  
Augmented Reality Storytelling.

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## DESIGNING LOCATIVE EXPERIENCES

A description of the goal that our application aims to achieve.

## INTERACTIVE DOCUMENTARY

An explanation of locative storytelling narrative for engaging in cultural heritage experiences.

## TECHNOLOGY STACK

A look into the development technologies used within the application.

## ARCHITECTURE

The complete breakdown of all the design and development decisions.

Maria Engberg, Jay Bolter, Joshua A. Fisher  
Cassie Mullins, Vinutna Veeragandham,  
Surina Puri, Danny Zhang, Josh Terry

# DESIGNING LOCATIVE EXPERIENCES

## Introduction

Celebrating Cultural Heritage through  
Augmented Reality Storytelling

The Augmented Environments Lab at the Georgia Institute of Technology has partnered with Malmö University to create a mobile application to provide users with a dynamic historical understanding of Malmö, Sweden. This mobile application makes use of video, audio, as well as other digital media to provide a comprehensive experience. This app aims to educate users in an innovative way and build upon artistic and design-based research methods to unveil, expose, query and shape the public and private narratives that frame city life.

# INTERACTIVE DOCUMENTARY

Storytelling

Community Empowerment and Timeless  
History through Mixed Reality

Through Georgia Tech's Argon AR Browser, any user of City Fables may experience the history of Malmö, Sweden first-hand as part of this interactive documentary. City Fables makes use of a rarely-seen degree of interactivity in order to immerse users head-first into the rich culture of 1920's Malmö. By placing a large emphasis on the procedural, spatial, and encyclopedic affordances of digital media, a timeless adventure through Malmö is experienced. City Fables is exemplary of a locative interactive documentary that celebrates a community's cultural heritage.



## MEMORY FABLES

Memory fables is a subproject in City Fables devoted to exploring historical moments that serve as a counterpoint to the stories and realities of contemporary Malmö. Primarily, the time period that we study span the 1910s, 20s and 30s since it was a time of important upheavals and nation-shaping events.

## HISTORIC MALMO

We are more interested in seeing these large scale historical events through the eyes of real, semi-fictionalized or fully fictional individuals. Similar to a cinematic or novelistic gesture of allowing the individual to echo the grandiose and large-scale, we are interested in working through characters' view points.



Malmö,  
Sweden

# TECHNOLOGY STACK

## Development

To develop our mobile application, we primarily utilized A-frame, a web framework for building webVR, mixed and augmented reality experiences. It is easily integrated and suited to our needs in the creation of this application.

This experience was designed specifically for use within the Argon AR browser.

We also explored the use of the Google Reticle. We used the Google Reticle

to create a hands-free experience for the user. The Google Reticle draws a circle in front of any object that the user gazes at. It dilates when an object is clickable and therefore allows for the hands-free experience.

### Programming Frameworks

- HTML
- Three.js
- JavaScript
- NativeScript
- A-frame



# ARCHITECTURE

## Design



We have decided to include video, audio and images as the primary method in which to express the narrative of Malmö. These forms of media will all be tied to specific geolocations. As the user explores the city in reality, the app will educate them on the neighborhood's history



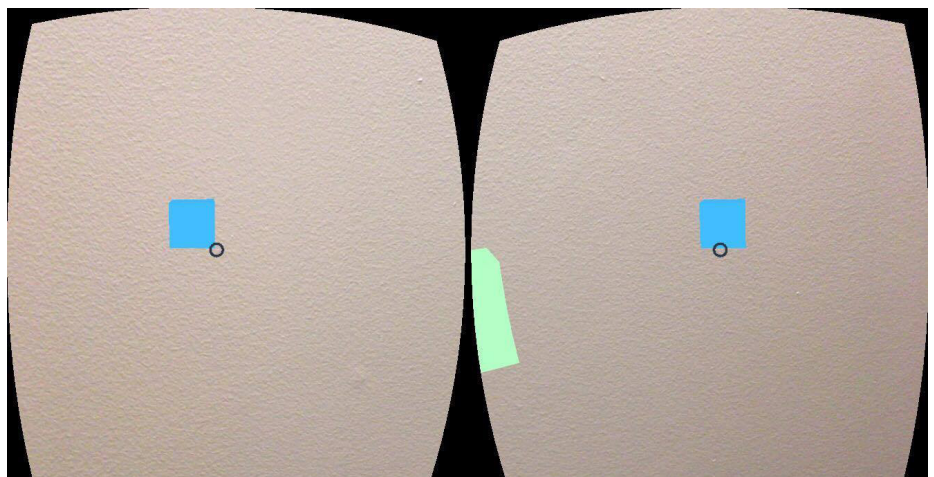
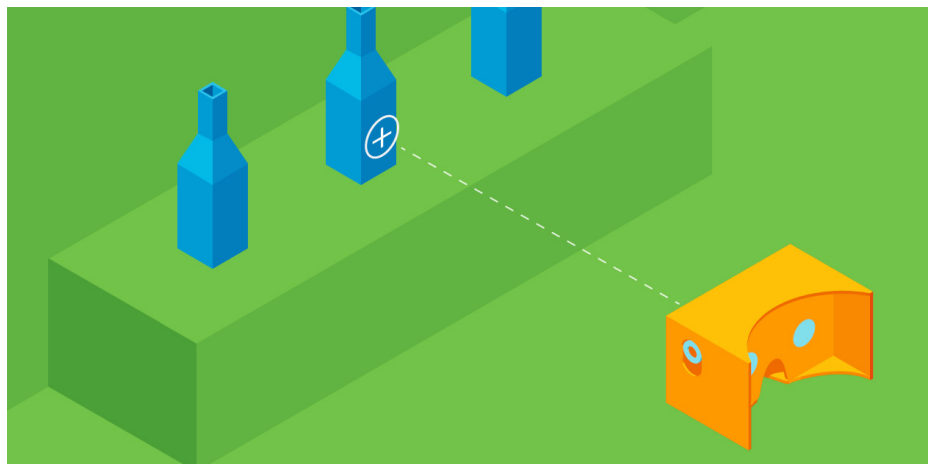
## CURSOR

The cursor is the bridge between the user and augmented reality. We realized that we needed a way for the user to interact with the environment around them in a hands-free way. When they're in viewer mode, the cursor provides a workable solution for this need. The cursor, as indicated by the black circle in the center, is always located at the focal point so that when a user changes the orientation of their head, the cursor moves

along respectively. The user interacts with the environment by focusing the cursor on an AR-element. After a few seconds the interaction will occur. The cursor is an essential tool for City Fables as it serves as the user's hands.



Demonstration of  
Google Reticle



A view of the menu opened in front of the user after the image option has been chosen.



## MENU

The design of the menu is intended to be used, hands-free, in a head mounted display. We decided to place the menu at the user's feet as this space is rarely interacted with while exploring a city. However, user feedback has encouraged us to consider placing it directly above the head. People naturally tend to look down while walking and it may cause the menu to pop up accidentally. When the user clicks on the menu icon at his or her feet, a full menu with various options will fly up into the user's regular view directly in front of them. This implementation allows our app to be truly hands-free.

# AUDIO

Audio is a simply implementable feature. We have made it so that any audio can be geolocated. There is the option of autoplaying this audio when the user reaches a certain location or by having a clickable object play the clip. This will be implemented depending on the specific user experience that is being developed. Audio is an effective way to communicate information to a user and is therefore a vital element to our application. Both diegetic and non-diegetic sound should be implemented.

Audio can be used alongside this visual to describe what is occurring in this scene.

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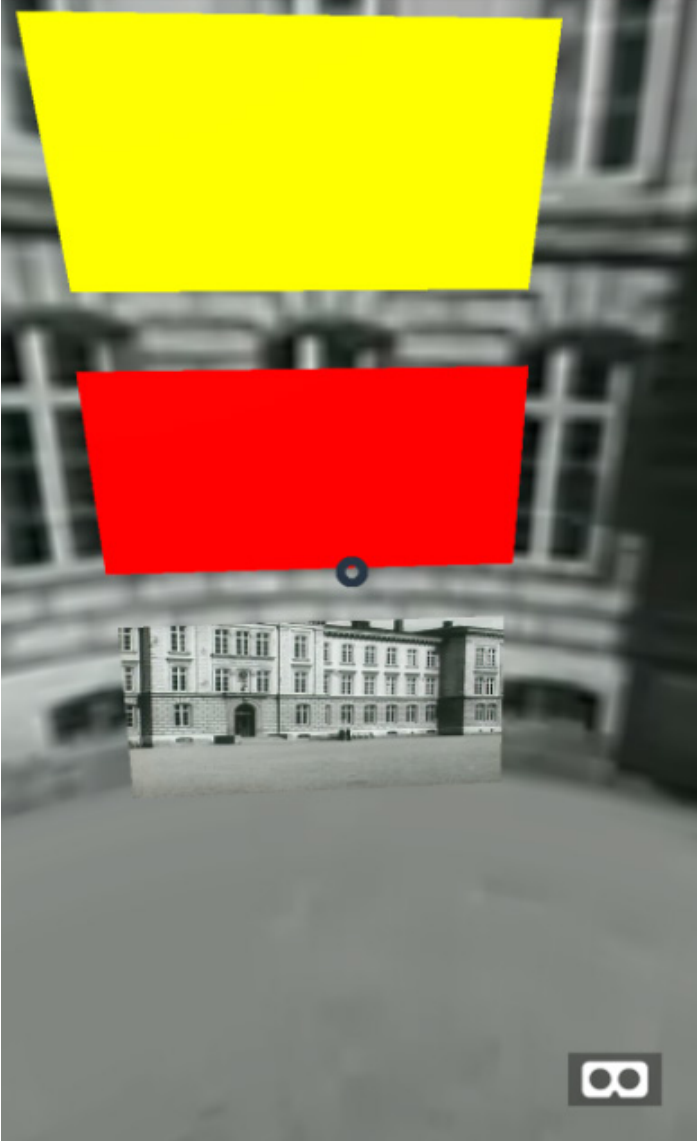
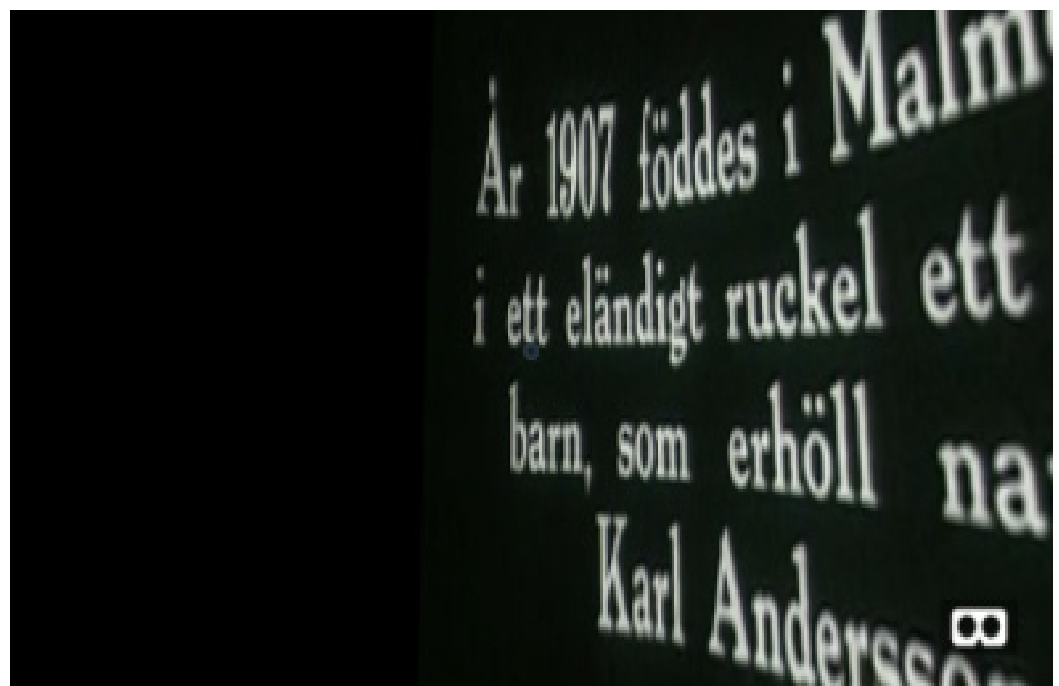


Image 1: Shows a 360 video playing in the background. The menu box at the bottom also play the same video

Still frames from video rendered horizontally.



# VIDEO

Videos are effective tools to present stories and therefore are an important part of our application. The following steps were followed to integrate videos.

1) A simple video and 360 degree video example were implemented using Aframe. An Aframe `<a-video>` texture was used for video and `<a-videosphere>` was used for 360 video.

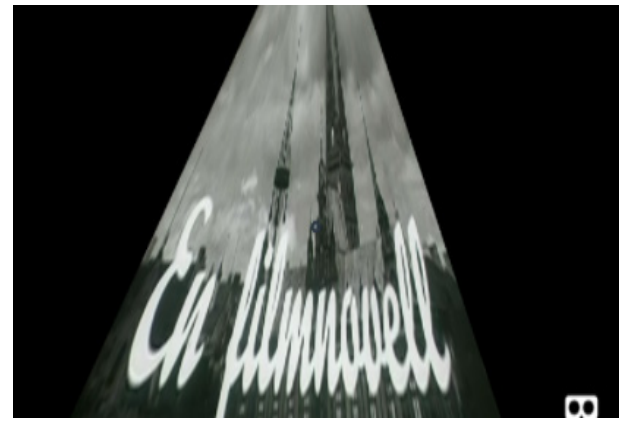
2) A video example was integrated in the menu by playing a video in one of the menu boxes. The material of one of the menu boxes was rendered as a video.

```
color.value = "src: #myVideo";
```

3) The Videosphere example was integrated into the menu by adding the following code in the index.html file:

```
<a-videosphere src="#myVideo"></a-videosphere>
```

Example  
video  
rendered  
at 80 degree  
Field of View



4) The field of view of the 360 degree video was narrowed to 180. Instead of rendering the entire sphere with the video, only a certain angle was rendered:

```
<a-videosphere src="#myVideo" geometry="phiLength: 180"></a-videosphere>
```

*Note: the video source is included in a text file under the textures folder in the resources folder. In order to play videos, the video files will have to be downloaded and placed in the textures folder.*

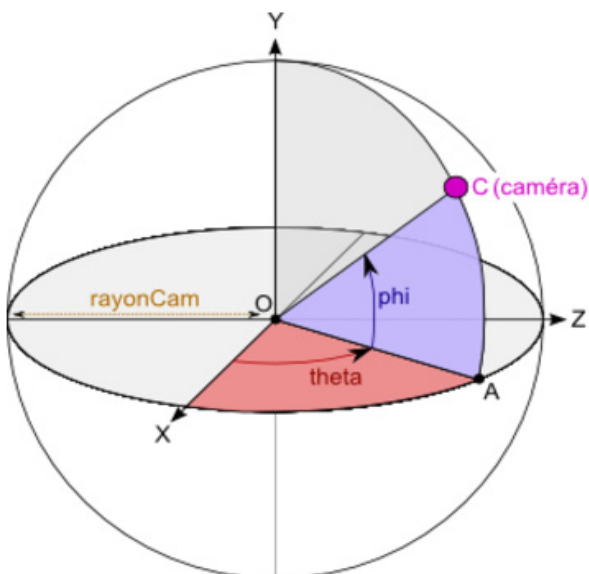
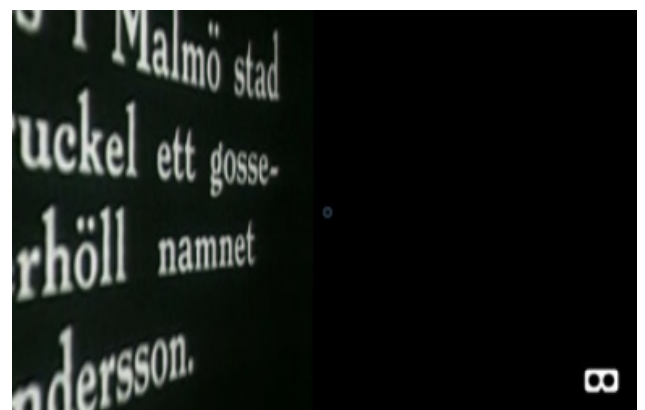
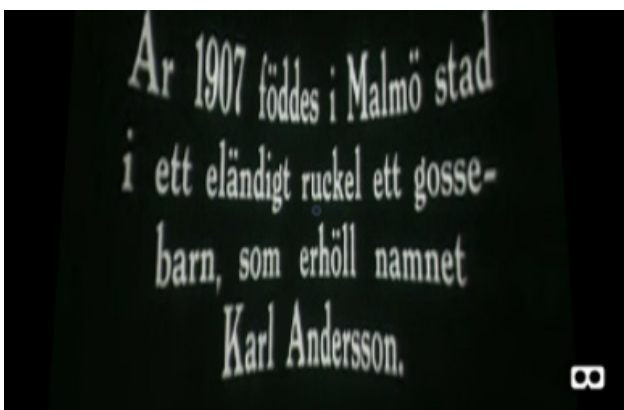


Image 2: Shows how different angles can be rendered in a sphere.



# IMAGES

A good image interaction paradigm is essential to the design of the app as most of the historical artifacts are likely old photographs. The first important aspect of the images to implement was their placement in the world based on a set of GPS coordinates. When users get to a location where the image was taken they can look at both the actual location and the historic photograph. Once this was accomplished we began experimenting with user interactions. One option is using the handsfree cursor to click on a small translucent image to bring up its full size version. Another option is to use the Argon Aframe trigger event, wherein coming within a certain distance of the image's location will trigger an event, such as the image changing color.

A sample image  
that will be  
used with our  
application.









