

Directed by Rayaan Sheik  
Starring Madhumita Srivatsan | Madhuri | Jaanhavi SP | Zuha Asif  
Guided by Prof. Mazhar Kamran | Prof. Aditi Chitre | Prof. Jayesh Pillai  
Translation Dr. Vasanthan | Crowd Assets Nidhi Chauhan | MoCap Zuha Asif | Siva, | Ankit

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**IDC** School of Design  
अभिकल्प विद्यालय

**“KANNAGI”**

Project Report

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Project 3

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# Approval Sheet

The Design Project 3 Titled “ KANNAGI ” by **Mohamed Rayaan , Roll Number 216340013**, is approved in partial fulfillment of the requirement for the ‘Master of Design’ in the Animation and Film Design at Industrial Design Center, Indian Institute of Technology, Bombay.

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## Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources.

I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission.

I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.



Mohamed Rayaan  
216340013

IDC School of Design  
IIT Bombay  
November 2022

## Acknowledgements

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## Abstract

The aim of this project is to depict the great Tamil epic, Silappatikaram by the Jain poet Ilango Adigal written in the 17th century. I would like to make use of virtual production tools in Unreal Engine to do the same. Through the course of this film I would like to bring to light and the culture, fashion and architecture of 17th century Tamil Nadu during the rule of the Pandya Dynasty and do justice to depict the magnificence that it was. The last known depiction of the story of “Kannagi” was in the 1964 film “Poompuhar”. Since then there have been no active adaptations or retellings for the current generation. With this intent I would like to use the current technology to retell the story of Kannagi in the best way I possibly can.



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# 1. Introduction

## 1.1. Silpathikaram - The epic of an anklet

Silpathikaram is the story of Kannagi, a woman who loses her husband due to a fault in a Pandya king's judgement and unjustly sentences him to death. The story follows her vengeance and quest for justice, leading her to burn and bring the city of Madurai to ashes. I intended to portray a particularly iconic scene from the story in which Kannagi confronts the king about his judgement and asks for justice to be meted out. Through this project, I wished to explore the cultural significance of the city of Madurai visually and also portray a piece of Tamil history considered part of the very roots of Tamil literature. Extensive work was done in trying to understand the clothing, the architecture and the social structure of the time in order to best represent the story for what it truly is.

## 1.2. Pipeline Overview

The pipeline used in the making of this film is divided into the following sections.

1. Research and Ideation
2. Pre-Production
3. Production
4. Post Processing

The first stage involved extensively studying about the story and the different variations of it that have been told over time. Following which

I spent time looking at what the attire and the architecture from the era looked like in order to best replicate the character designs and the set design. The pre-production stage consisted of storyboarding, making the characters and sets, which was followed by production and post processing which followed a general 3d animation pipeline using real time production using Unreal Engine and compositing and editing. The production was done using motion capture technology with the help of a motion and facial capture suit.

# 2. Research & History

## 2.1. Silpathikaram - The epic of an anklet

The initial study started with secondary research on the various retellings of the story as well as studying the original poem written by 'Ilangoadigal'. The last known film adaptation of this story was the 1964 film 'Poompuhar', after which there has been no retelling. Through this study I was able to learn that there is no known true account of the story, each region of Tamil Nadu and Kerala have their own spin to the story. The following are a few of the accounts as recorded in the paper "Variations in and of the Story of the Silappathikaram (the Epic of the Anklet)" by Dr Eric Miller.

1. Kannagi was the daughter of the Pandian king. The court astrologer told the king that the king's daughter would be involved with the destruction of Madurai. The king ordered his men to take his infant daughter into the forest and kill her, but instead they took her to the ocean and put her in a basket which they pushed into the sea,

and which was eventually plucked out of the water by a fisherman (Beck, 1972, p. 26). (This is not mentioned in the classical text)

2. The court goldsmith in Madurai was in fact the person who had stolen the Pandian queen's anklet. This goldsmith not only accused Kovalan of stealing the Pandian queen's anklet, but also accused Kovalan of having an affair with the Pandian queen (Beck, 1972, p. 28). (This is not mentioned in the classical text.)
3. In Madurai, after Kovalan was beheaded, Kannagi stitched his head back onto his body with a golden thread drawn by a silver needle. Kovalan came back to life. However, as time went on, Kovalan made it clear that he was still in love with Madhavi, and he continued to save the best food for Madhavi. As a result, at a certain point Kannagi pulled the thread, and Kovalan's head fell off and he died again. (This episode is narrated by Dr. C. Sumaresan and Dr. A. Ramanathan in the "Episodes in the Countryside" video recording at <http://tinyurl.com/Kannagi-Places> , beginning at 8:35.) (This is not mentioned in the classical text.)
4. One tradition is that Kannagi was a manifestation of goddess Kali, especially when Madurai was burning (Beck, 1972, p. 28). Another tradition is: After Kannagi had founded a village and tribe in the forest, she was wandering in the forest. Siva came and addressed Kannagi as goddess Shakti. Kannagi remembered her divine nature, returned to her form as Shakti, and ascended to heaven with Siva. This is in the 1941 movie, "Kannagi", by Jupiter Films. In contrast, the classical text states that a divine chariot, in which the resurrected Kovalan was sitting, descended from the sky, Kannagi entered the chariot, and the chariot took them both up to heaven.

## 2.2. Final Story

Kannagi storms into the court of King Neduncheliyan Pandyan with rage. The King's courtiers, shocked by the appearance of a common woman boldly walking into the palace, ask her what she wants. She accuses the king of wrongfully accusing someone and calls him a careless and unjust ruler. The King is enraged by this accusation and asks her who she is and how dare she blame the king this way. She speaks of the land she comes from and herself. She goes on to tell the king who her husband was and how he was unjustly beheaded for stealing the queen's anklet while he was actually just in the market to sell Kannagi's anklet which looked very similar. The king justifies his ruling by calling her husband a thief. She challenges the king's decision by asking him about the stones inside the queen's anklet to which the king replies by saying it contained the purest of pearls. Kannagi laughs and tells the king that her anklet contained rubies. Angered by this, the king shatters the queen's anklets one after the other. While the first one broke open to reveal pearls. The second one scattered rubies that flowed like the embers of fire around the court floor. The king sits down in shock never taking his gaze off the glowing rubies. Kannagi laughs maniacally and asks how the king is going to repent for his mistakes. The king apologises with dignity and asks Kannagi for forgiveness. At this point Kannagi has no room for forgiveness and in her rage and to seek vengeance, she curses the kingdom to burn down to ashes and shatters the anklet she is holding. The rubies that come out glow brighter and brighter until a fire emerges from each of the stones engulfing the entire kingdom and the people in it as Kannagi walks away from Madurai, her eyes still holding the vengeful stare.

## 3. Pre Production

### 3.1. Concept Visuals

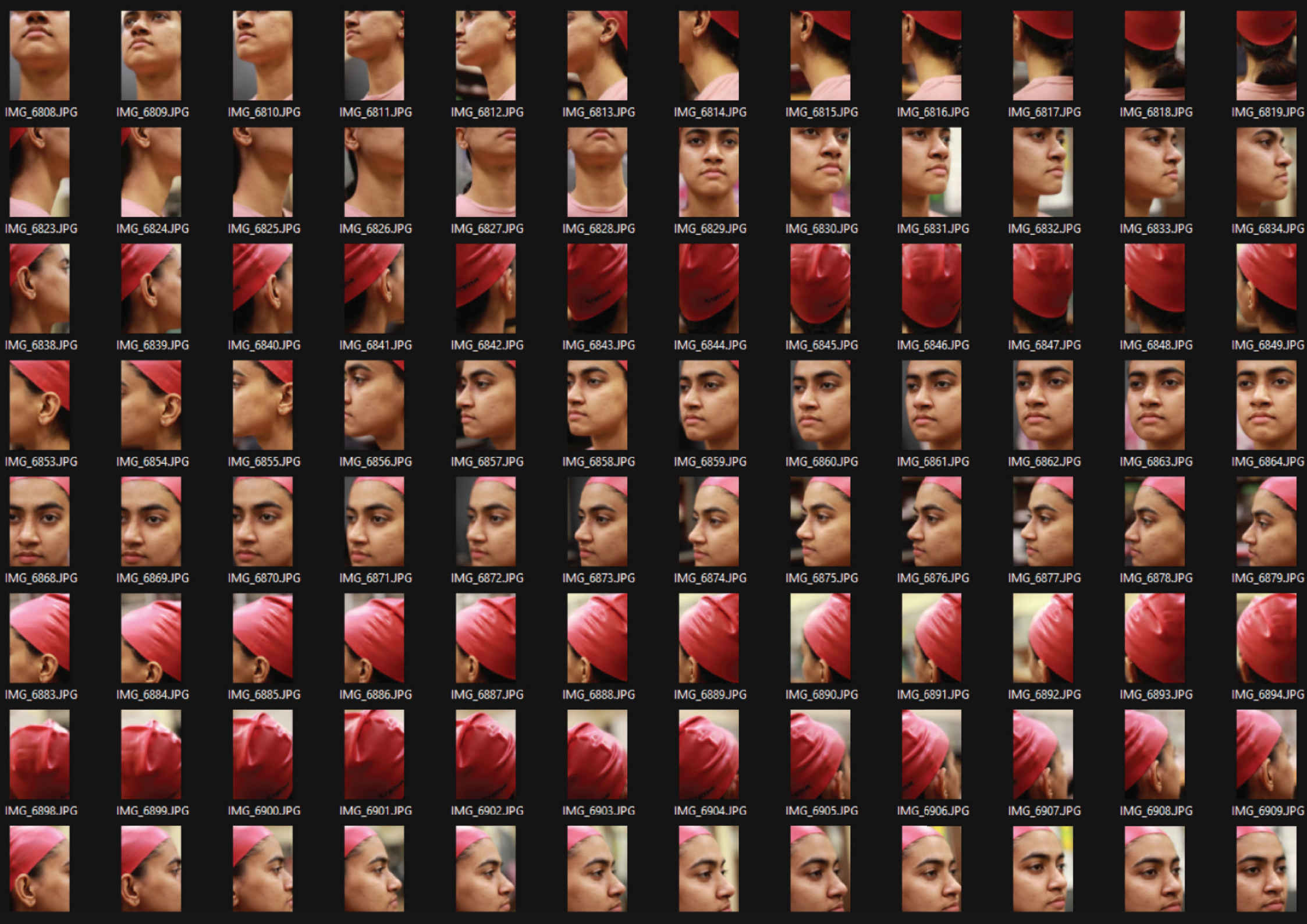
Concept visuals for this film was generated using ‘Midjourney’, which is an AI model that generates art using prompts given as text input. This was an experimental process I wished to carry out to see the extent to which I can get concept art that would not be confined to the imagination of my lone self. These paintings were loosely used as reference material upon building the set and deciding the visual look of the film.

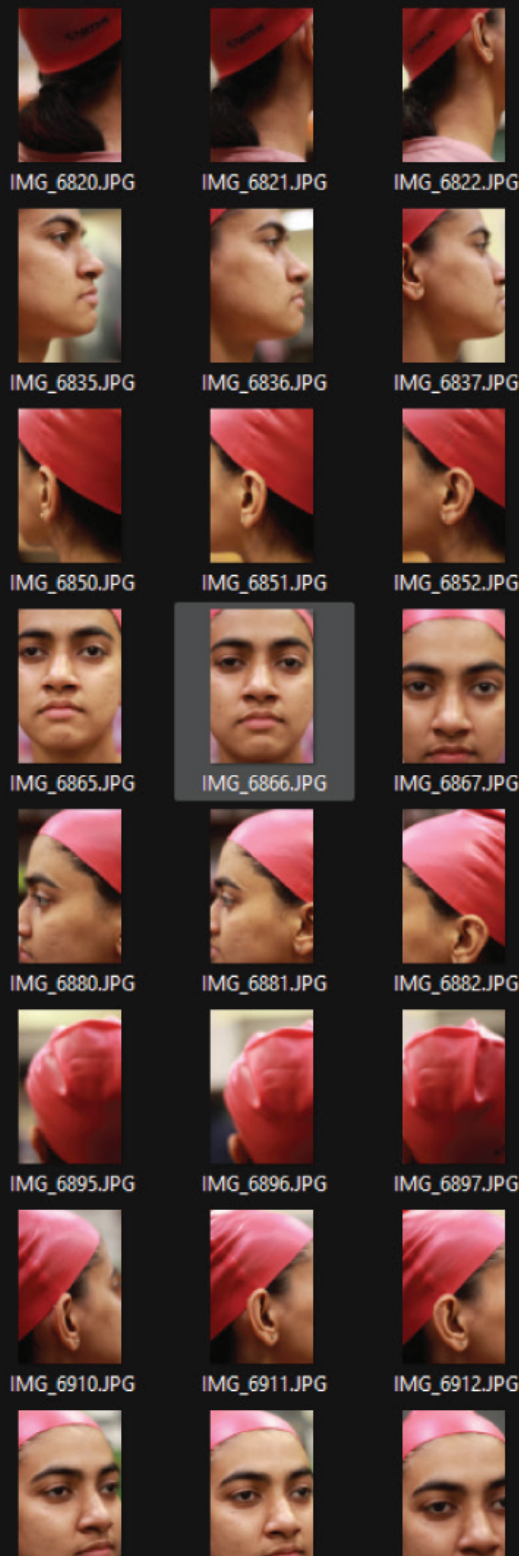


Fig. AI generated visualisation of Kannagi









### 3.2. Character Design

All the characters were created using a feature called Mesh to MetaHuman in Unreal Engine which is a plugin which allows for custom meshes to be converted into MetaHumans. Several photos of the subjects face were captured from various angles and a 3d model was generated using a photogrammetry software called 'Reality Capture'. This 3D model along with its texture map was imported into Unreal Engine to generate an animatable mesh which was then plugged into MetaHuman Creator to convert it into a MetaHuman. The MetaHuman Albedo Maps were then painted upon to add custom design elements such as 'thikas' and 'scars' to the characters in order to bring them to a more regional looking style.



Fig. Generated UV Texture Map from Photogrammetric Model



Fig. Kannagi



Fig. Nedunchezhiyan



Fig. Koppurendevi

### 3.3. Costume Design

In order to design the costumes, first an extensive study was done into the fashion of that time in Madurai and its adjoining cities. After learning how to drape the different attires, the same was simulated digitally using Marvelous Designer. The men of royalty wore silk dhotis and the women wore sarees with heavy embroidery like the “Kancheepuram Silk Sarees”. A sigil was design based off of records of the Pandya dynasty sigil and the same was used as a decorative element in all the attire of the members of the royal family. The costume for kannagi was kept a simple red plain saree to reflect her state of total loss and rage.

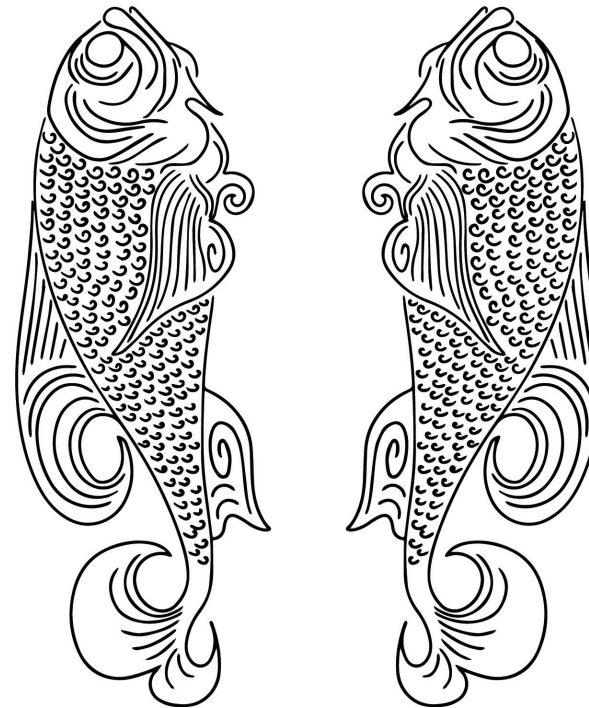


Fig. Sarees across India



Fig. Border 'Zari' design



Fig. Zari pattern with sigil



Fig. Kancheepuram style saree draped as dhoti for 'Nedunchezhiyan' with a gold laced shawl



Fig. Kancheepuram patterned overdressed saree with gold zari borders for 'Koppurendevi'



Fig. Ordinary red cotton saree drape with no patterns for 'Kannagi'

### 3.4. Set Design

Since the story is said to have taken place in the city of 'Madurai', the main inspiration for designing the palace interiors was the "*Aayiram Kaal Mandapam*" or the "Palace of a 1000 Pillars" located in the city. The different elements of the palace were either photoscanned at live locations or modeled in Blender with Tamil temples and palaces as reference points. In order to drive the grandeur of the story, the palace was made with an open facade in order to drive in harsh dramatic lighting, making things seem bigger than they would normally seem. The materials and textures were made in Unreal Engine along with the volumetric Lumen lighting system to push the story cinematically.









## 4. Production

### 4.1. Motion Capture

The entirety of the character animations were done using Motion Capture. Using an XSens Motion Capture suit, I was able to get all of the animation data for each scene with the actors acting out the scene in realtime with each other. This allowed me to also take reference for how the interaction can be best played out in the edit.



Fig. Motion Capture Sessions with Madhuri & Rayaan

### 4.2. Voice Over / Dubbing



Fig. Voice Over for Kannagi by MadhumitanSrivatsan



Fig. Voice Over for Nedunchezhiyan by Rayaana Sheik

### 4.3. Unreal Engine

The motion capture data was fed into the characters in unreal engine along with the virtual set. Using a game engine allowed for the entire film to be treated like shooting a love action movie. The camera and lensing decisions were made carefully planning out what would enhance the drama of the scene bringing out the tension in the characters. Unreal Engine also allowed for easy clean up of the Motion Capture data enabling to push the animation.

### 4.4. Live Link Face for Unreal Engine

All of the facial acting for this film was captured in real time using an iOS app by Unreal Engine called 'Live Link Face'. The app's tracking leverages Apple's ARKit and the iPhone's TrueDepth front-facing camera to interactively track a performer's face, transmitting this data directly to Unreal Engine via Live Link over a network. This captured data was available in both the raw blendshape data (CSV) and a front-facing video (MOV) which helped further tweak the acting using keyframe correction in the engine.



Fig. Unreal Scene Render before colour grading and vfx composite

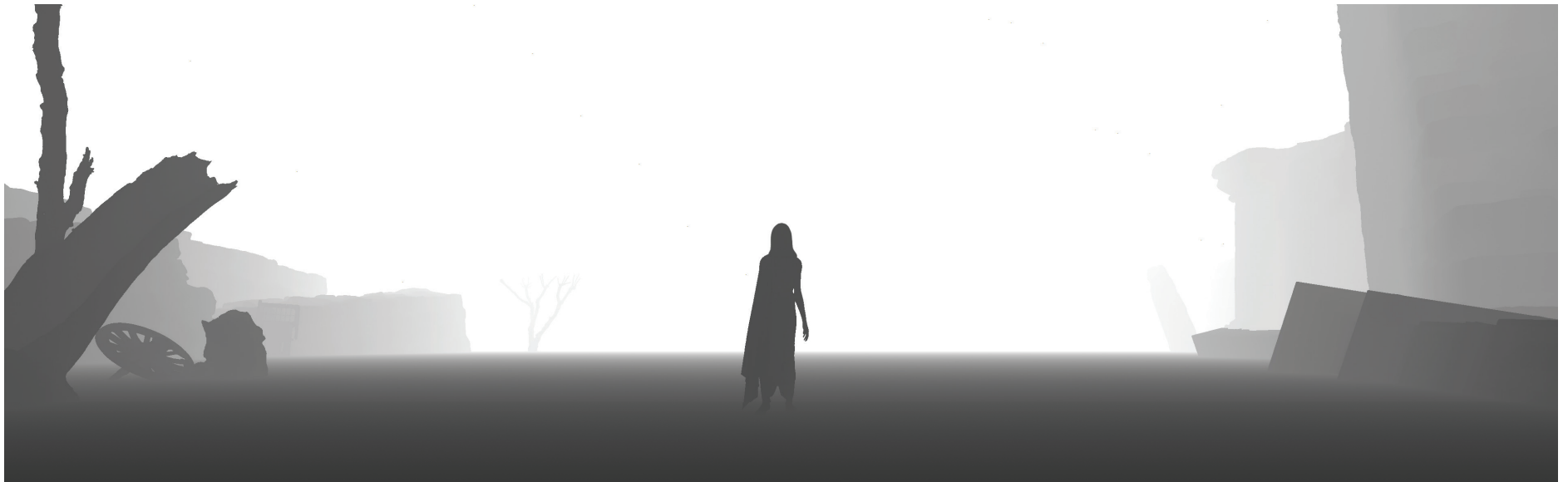


Fig. Z Depth pass to be used as mask for compositing



Fig. Final render post VFX and colour correction

## 5. Post Processing

The post process compositing was done using Adobe After Effects. A depth pass along with the footage was rendered out of unreal engine and was used to composite the different VFX elements using the depth pass as a mask. Further color grading was done to the film after editing on Da Vinci Resolve Studio.

## 6. Conclusion

Through the use of 3D animation tools and Unreal Engine. The great epic of the anklet was adapted and a short version of it was retold in the film format. Through this project I was personally able to use the opportunity to bring out the culture of Tamil Nadu and design methods in which the same can be portrayed in digital animation. It also was a great experience to be able to use professional virtual production tools and work with motion capture and game engines to see how best we can improve the field of filmmaking and animation.

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