**Catify Documentation**

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**Introduction**

**Project Overview**

The AR Project is a web-based augmented reality application that provides real-time face tracking and interactive filters. The application uses Media Pipe's Face Mesh technology to detect facial landmarks and apply various visual effects, including a cat filter, jewel necklace, and interactive sound effects.

**Key Features**

- Real-time face tracking and filter application

- Interactive cat filter with animated elements

- Background music with toggle control

- Meow sound effect triggered by mouth movement

- Photo capture functionality

- Camera controls (front/back toggle)

**System Requirements**

**Hardware Requirements**

- Webcam or mobile device camera

- Microphone (for sound effects)

- Speakers or headphones

- Minimum 4GB RAM

- Stable internet connection

**Software Requirements**

- Modern web browser (Chrome recommended)

- JavaScript enabled

- Camera permissions

- Audio permissions

**Supported Browsers**

- Google Chrome (version 80+)

- Mozilla Firefox (version 75+)

- Safari (version 13+)

- Microsoft Edge (version 80+)

**Installation Guide**

**Step 1:** Clone the Repository

```bash

git clone [repository-url]

cd AR\_project

```

**Step 2:** Set Up Local Server

1. Install a local server (e.g., Live Server in VS Code)

2. Open the project folder in your code editor

3. Start the local server

**Step 3:** Access the Application

1. Open your web browser

2. Navigate to `http://localhost:[port]`

3. Allow camera and microphone permissions when prompted

**User Guide**

**Starting the AR Experience**

1. Click the "Start AR Experience" button

2. Grant necessary permissions

3. Position yourself 2-3 feet from the camera

4. Ensure good lighting conditions

**Controls and Features**

**Main Controls**

- \*\*Start AR Experience\*\*: Initiates the AR session

- \*\*Exit AR\*\*: Ends the current session

- \*\*Music Toggle (🔊)\*\*: Controls background music

- \*\*Camera Toggle (🔄)\*\*: Switches between front and back cameras

- \*\*Photo Capture (📸)\*\*: Takes a screenshot

**Interactive Features**

- **Cat Filter:**

  - Animated ears that wiggle

  - Tracking eyes that follow movement

  - Whiskers that move

  - Nose that follows facial expressions

- **Sound Effects:**

  - Background music with toggle

  - Meow sound on mouth opening

**Technical Documentation**

Project Structure

```

AR\_project/

├── index.html          # Main HTML file

├── styles.css          # CSS styles

├── ar.js              # Main JavaScript file

└── README.md          # Documentation

```

**Core Components**

**Face Tracking Implementation**

```javascript

faceMesh.setOptions({

    maxNumFaces: 1,

    refineLandmarks: true,

    minDetectionConfidence: 0.5,

    minTrackingConfidence: 0.5

});

```

**Sound Implementation**

```javascript

*// Background music*

const bgMusic = document.getElementById('bgMusic');

bgMusic.loop = true;

*// Meow sound*

const catSound = document.getElementById('catSound');

```

**Key Functions**

**Face Detection**

- `startAR()`: Initializes camera and AR experience

- `detectFace()`: Sets up face tracking

- `onResults()`: Processes face tracking results

**Filter Implementation**

- `drawSnapchatFilter()`: Renders cat filter

- `drawJewelNecklace()`: Renders necklace effect

- `checkMouthOpening()`: Detects mouth movement

**Control Functions**

- `toggleMusic()`: Controls background music

- `toggleCamera()`: Switches camera view

- `takePhoto()`: Captures current view

**Troubleshooting**

**Common Issues and Solutions**

**Camera Issues**

1. Camera Not Working

   - Check browser permissions

   - Ensure no other applications are using the camera

   - Try refreshing the page

2. Poor Face Tracking

   - Improve lighting conditions

   - Adjust distance from camera

   - Ensure face is clearly visible

**Sound Issues**

1. No Sound Effects

   - Check browser sound permissions

   - Ensure device is not muted

   - Try using a different browser

2. Background Music Not Playing

   - Check if music is enabled

   - Verify audio permissions

   - Try refreshing the page

**Performance Optimization**

- Close unnecessary browser tabs

- Ensure good lighting conditions

- Maintain stable internet connection

- Keep browser updated to latest version

**Appendix**

**MediaPipe Face Mesh Landmarks**

The application uses 468 facial landmarks for precise tracking:

- Eyes: 33, 263, 133, 362

- Nose: 1

- Mouth: 61, 291

- Chin: 152

- Temples: 234, 454

- Forehead: 10

**Color Codes**

- Cat Ears: #F5F5DC

- Inner Ears: #FFB6C1 to #FF69B4

- Eyes: #FFD700

- Whiskers: #FFFFFF

**Animation Parameters**

- Ear Wiggle: Math.sin(animationFrame \* 0.1) \* 3

- Whisker Wave: Math.sin(animationFrame \* 0.1) \* 5

- Sound Cooldown: 500ms

- Mouth Open Threshold: 0.15