

Developer Guide for 3D Head Modeling Web Application

1. Project Overview:

Objective: Develop a web application that allows users to upload a photo of their face or head, create a 3D model, and modify hair styles.

Features: User authentication (Google Firebase), image upload, 3D modeling, hair style customization, interactive user interface.

2. Technology Stack:

Frameworks: React for frontend dynamic interfaces, Node.js for scalable backend.
(You can use other Frameworks)

Research Ideas: If you have other ideas, you can use it too.

3D Modeling Libraries: Three.js or similar for creating and manipulating 3D models.

Image Processing: OpenCV or similar for analyzing and processing user-uploaded images.

3. System Architecture:

Comprehensive description of the overall system architecture including frontend, backend, and data flow.

Detailed component diagram and interaction flow between user, server, and 3D processing.

4. Development Steps:

a. User Interface: Detailed guide on creating an intuitive and responsive UI/UX.

b. Backend Development: Steps for setting up server, handling requests, and integrating with 3D modeling.

c. Integration of 3D Modeling: Detailed approach to convert 2D images into 3D head models and implementing hair changes.

5. Image Processing and Analysis:

Discuss various algorithms for head shape detection from 2D images.

Techniques for effectively scaling and fitting the 3D models onto the detected head shape.

6. Optimization and Best Practices:

Best practices in code organization, and maintaining clean, readable code.