Diversified Anatomy and Physiology
Lab Resource App

anatomia

Our Team

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Front/Back-End Developer

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Clients

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FIRST
Clients displays diagrams and three dimensional models during lecture.

NEXT
Clients will have students study the models by analyzing them.

LAST
Clients will test students based on these diagrams. An example being labeling models.

What's the Problem?

A lack of diversified anatomical models in the BIO201 curriculum, resulting in the inability to diagnose skin pathologies and feelings of underrepresentation.

Current Solution: Low supply non-white slim models and expensive software.

Solution Overview

Solution:
- A diversified approach to anatomical models as an interactive web application.
- Students can use to tailor their models to their learning.
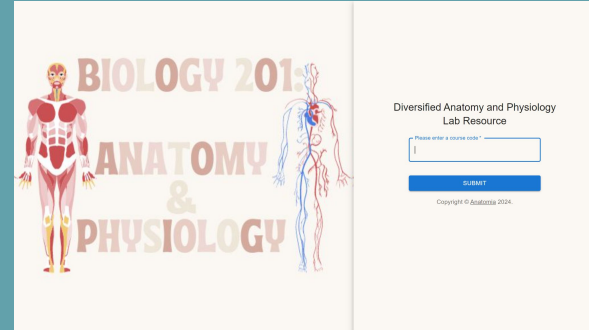- Enhance diversity and understanding of the material.

Key Features:
- A 3D customizable anatomical model.
- Adjustable settings for biological gender, skin tone, and body size.
- Accurate content specific to BIO 201.
- Real-time updates.

Implementation Overview

The major requirements that we plan to fulfill are:

1. Course Access
2. Content Main Menu
3. Interactive 3D Modeling
4. Display Course Content
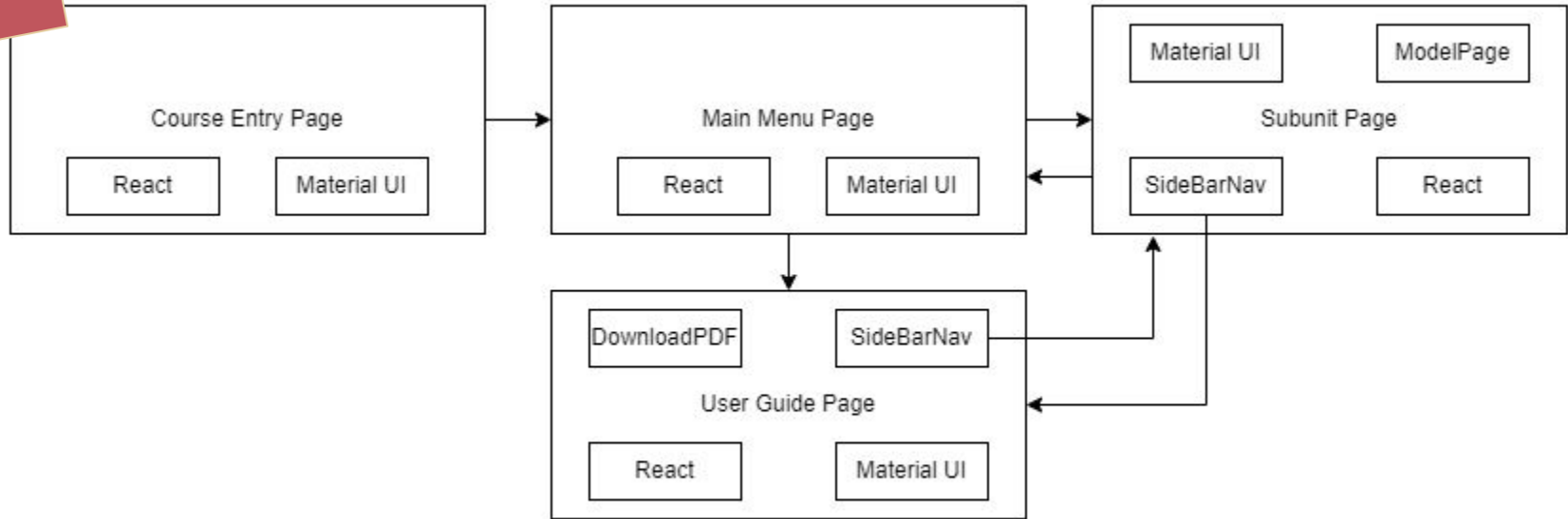5. Exporting Models
6. User Guide

Front End Implementation Details

React, Material UI

Front End Implementation Details

Three.js, React, Material UI
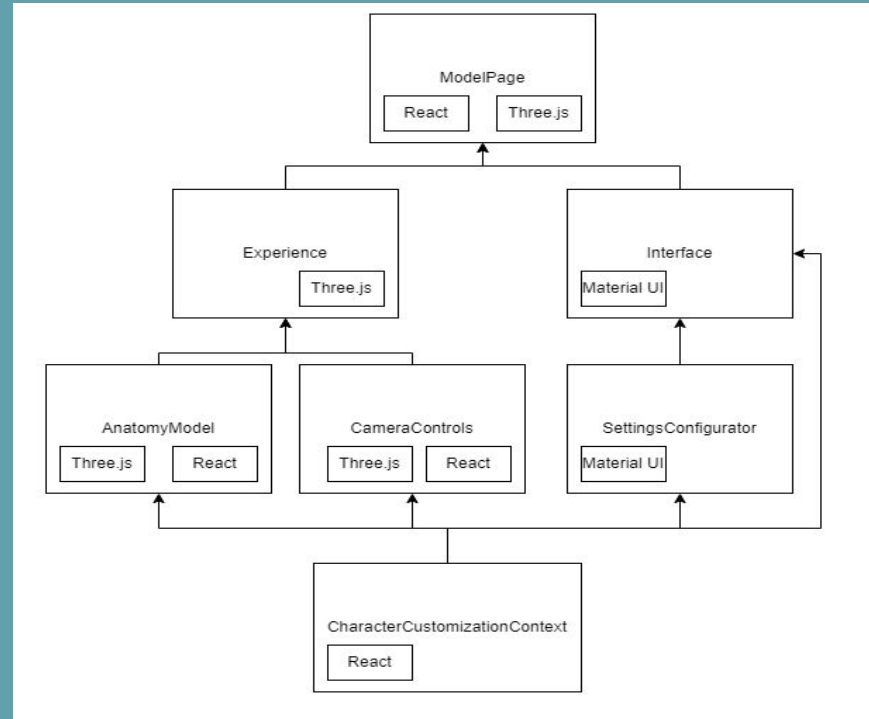
Back End Implementation Details

Firebase Realtime Database

1	Course Data	Top level collection
1.1	Units	Overarching unit topic
1.1.1	Subunits	Specific topic section
.1	Title	Title of the subunit
.2	Description	Content of the subunit
.3	Image	Content image for further explanation (Optional)
1.1.2	Model Files	Model files array for the unit
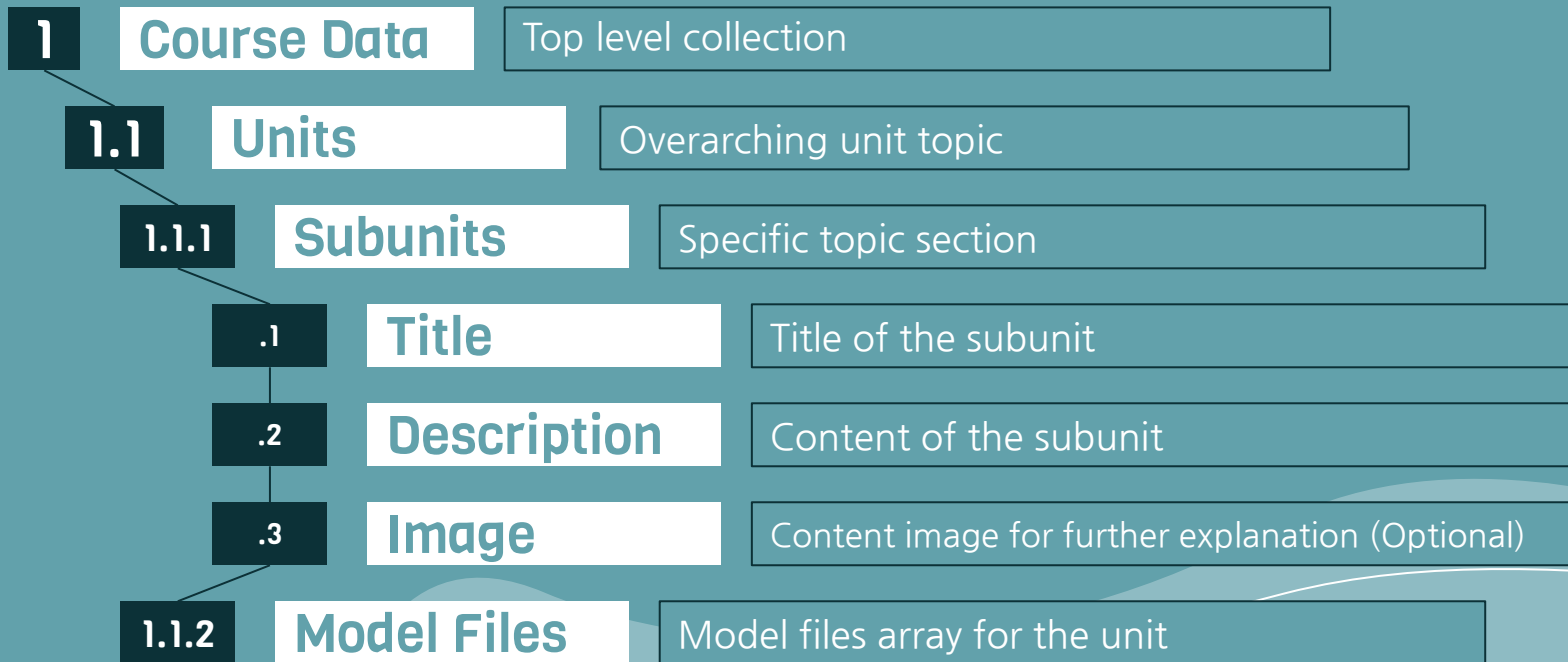
Challenges & Resolutions

Lighting & Camera Controls:
- Lighting/Camera are essential to see the model.
- Resolution: Three.js, an easy to use online editor, that allowed us to experiment with lighting and model materials.

Database Management (Firebase):
- Storing rendered .gltf model and course content files.
- Resolution: Firebase configuration and setup remote data retrieval.

Model Interactivity:
- Creating the functionality to modify body size, skin tone, & biological sex.
- Resolution: Components that manages state related to model customization.

Front End Responsiveness:
- Creating a responsive yet simple front end.
- Resolution: Google's Material UI provides comprehensive components that can be used in production immediately.

Spring 2024 Schedule

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Spring Break	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16
Home Page Menu	✕	✕	✕													
Subunit Pages		✕	✕	✕												
3D Model Rendering		✕	✕	✕	✕	✕										
Model Adjustments				✕	✕	✕	✕									
Model Interactivity					✕	✕										
Export Model User Interface						✕	✕									
Export/Save Model Functionality						✕	✕	✕								
Database Setup & Initialization			✕	✕												
Data Storage			✕	✕	✕											
Data Retrieval				✕	✕	✕										
Database Administration																
User Guide Tutorial Content									✕							
User Guide Tutorial Layout										✕						
User Guide Assistance Options																
Download PDF Tutorial Kit									✕							
Unit Testing																

Legend:
- Unit Selection Menu
- Content Display & Interaction
- Export/Save Models
- Data Storage & Management
- User Guide

Conclusion

Goal: Improve representation of the diverse population in academia.

Solution/Key Features:
- Web application
- Tailored Models
- BIO 201 Content

Implementation:

Front-end:
- Content
- Anatomical Model Features

Back-end:
- Database

Challenges & resolutions

Up Next: Testing