BUDS-Crochet: A Comprehensive Yarn Management Application

Empowering Crochet Enthusiasts

Deivanai Saravanan and Ishita Narang

March 12, 2025

Objective

- To develop a web application that assists crochet enthusiasts in managing their projects effectively.
- To provide functionalities such as pattern exploration, yarn calculations, and user authentication.
- To enhance user experience by integrating with external APIs for pattern data.

Key Features

- **Explore Patterns**
- **Yarn Calculator**
- **Row Counter**
- **Create Patterns**
- **View Patterns**
- **User Authentication**
- **Responsive Design**
- **Database Integration**

Project Structure

Client:

- Built with React and Vite for a responsive frontend.
- Contains pages for user interaction, including Home, Login, Yarn Calculator, and Explore Patterns.

Server:

- Built with Node.js and Express.
- Handles API requests, user authentication, and data management.

Blender Backend:

- Utilizes FastAPI for rendering crochet patterns in 3D.
- Integrates with Blender for visualizing crochet designs.

Tech Stack

- **Frontend:** React.js, Tailwind CSS
- **Backend:** Node.js + Express.js, Flask API (for visualization integration)
- **Database:** MongoDB
- **Authentication:** JSON Web Tokens (JWT), Mail Verification & OTP System
- **Visualization:** Blender + Python
- **API Integration:** Ravelry API for pattern exploration

Challenges Faced

- **API Integration:** Difficulty in integrating with the Ravelry API due to authentication and data format issues.
- **User Experience:** Ensuring a smooth and intuitive user interface while managing complex functionalities.
- **Data Management:** Handling user data securely and efficiently, especially with sensitive information.
- **Testing and Debugging:** Identifying and fixing bugs during development to ensure a stable application.

Future Scope

- **Enhanced Features:** Adding more advanced features like project tracking, yarn inventory management, and community sharing.
- **Mobile Application:** Developing a mobile version of the application for on-the-go access.
- **Machine Learning:** Implementing machine learning algorithms to suggest patterns based on user preferences and past projects.
- **Collaboration Tools:** Allowing users to collaborate on projects and share patterns within the community.