

Project Contribution Summary – Feeding Dashboard

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Roles: Front-End Development, Machine Learning Integration

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Front-End Development – Login & Signup Pages

In the Feeding Dashboard project, I was individually tasked with designing and building the login and signup pages using HTML, CSS, and JavaScript. These pages were secure gateways to the dashboard and played an important role in managing user authentication and allowing access to confidential patient data to authorized users alone. I meticulously organized the pages with semantic HTML elements to provide better accessibility and ensure correct document flow, particularly for those users who use assistive technologies. Styling was completed with an emphasis on providing a clean, modern, and professional user interface that would be easy to use and pleasing to the eye for healthcare professionals. I applied responsive design concepts so that the layout would flow smoothly across screen sizes and devices, from desktop computers to tablets and mobile phones. Aside from the authentication system, I also integrated the CSV upload function in the dashboard to allow healthcare staff to upload patient information easily. When any patient is selected from the list uploaded, detailed information specific to the selected patient, including physiological information and a personal graph, is dynamically displayed on the dashboard. Additionally, all the other related graphs on the dashboard are also populated in real time with the information of the selected patient, thereby creating a seamless and informative experience for the user.

JavaScript was extensively used to deliver an improved overall end-user experience and ensure reliable, responsive form processing. I utilized real-time input validation to check for proper email format, password strength, and other critical requirements, providing users immediate error feedback and visual cues to enable them to correct their mistakes. Not only did this improve usability but also reduced the chances of posting bad data. Additionally, I integrated the forms into the backend through JavaScript to enable seamless login and signup functions without page reload, enhancing the user experience to be more sleek, fast, and modern. I wrote the JavaScript code with the help of Rehan, who contributed significantly in inserting the supporting logic behind the interactive elements of the dashboard. We collaborated to ensure that JavaScript not only facilitated user login but also controlled the major functions of the dashboard, including dynamic data display, graph real-time update, and responsiveness.

During development, I encountered several issues. One such issue was form validation not being executed properly under certain edge cases—if, for instance, users completed it through autofill or by copying and pasting data. To rectify this, I refactored parts of the validation code to also respond to 'change' and 'input' events. Another issue was form

submitting incorrectly because field names were missing from the POST request. Debugging it made sure that form elements received proper names and matched backend parameters.

Additionally, cross-browser styling variations brought about layout alterations in older browsers. I neutralized this through the use of fallback styles as well as compatibility checks on different systems. Ultimately, these moves were able to result in highly usable, responsive, and secure login/signup interface that worked as expected on varied systems.

Machine Learning Algorithm – Integration and Visualization

In parallel with frontend development, I assisted in integrating the machine learning algorithm which decides which patients of the CCU should be referred to a dietician. I worked on this component together with Sultan, who was mainly engaged in developing and optimizing the algorithm itself. My role was focused on ensuring the receipt, interpretation, and graphical representation of the model output accurately within the dashboard UI in a way that would allow medical practitioners to intuitively understand and act on the recommendations. I also collaborated with Sultan to debug instances of patients being incorrectly flagged due to logic mismatches, and we revised the integration pipeline together so that only patients who met the referral criteria of the model were highlighted. This required a deep understanding of the algorithm's parameters, decision logic, and output schema. We conducted thorough testing on a number of sample datasets to ensure the validity of the algorithm, refine its accuracy, and test the integrity of incorporating it into the overall system.

Conclusion

This project was a valuable experience for me to apply and advance my proficiency in front-end web development and machine learning integration. Through the deployment of solid login and signup pages and proper visualization of algorithmic results, I was able to help produce a dashboard that genuinely had the potential to be applied in a practical healthcare environment. The experience also taught me the importance of testing, user experience, and handling real-world data issues, which will be useful for future development endeavors.