



PARSHVANATH CHARITABLE TRUST'S

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Department of Information Technology

(NBA Accredited)



Physiotherapist Exercise Estimator

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Project Guide
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1. Introduction

- Problem Identified :
 - Patients have unique needs and abilities that require personalized exercise plans.
 - Physiotherapists need a more efficient and effective way to design personalized exercise plans for their patients.
- Solution Proposed :
 - Machine learning algorithms can be used to analyze patient data, such as medical history and fitness goals, to generate personalized exercise plans that are tailored to the patient's needs and abilities.

2. Objectives

1. To design and develop a web app that uses machine learning algorithms to generate personalized exercise plans for physiotherapy patients.
2. To improve the efficiency and effectiveness of physiotherapy by automating the process of designing personalized exercise plans.
3. To improve patient outcomes by generating exercise plans that are optimized for each patient's unique needs and abilities.
4. To improve access to care by providing patients with access to personalized exercise plans regardless of their geographical location or financial situation.

3. Scope

1. The web app could be expanded to include features for other areas of physiotherapy, such as pain management or post-surgical rehabilitation.
2. The web app could be integrated with wearable devices or sensors to track patient progress and provide real-time feedback on their exercises.
3. The web app could be integrated with electronic health record (EHR) systems to streamline the process of designing personalized exercise plans and improve communication between physiotherapists and other healthcare providers.

4. Literature Survey

Sr.no	Title	Author(s)	Year	Limitations	Algorithms	Result
1	Machine learning techniques in physiotherapy assessment and Rehabilitation	A. J Lisboa R. P. Pereira, C. M. Silva	2021	The machine learning algorithms used in the project may have limitations, such as overfitting, underfitting, or inability to capture complex patterns in the data	k-Nearest Neighbors, Decision Tree, Random Forest, Support Vector Machines	Machine learning techniques can be useful in analyzing and interpreting data from various sources, such as wearable sensors, video recordings and electronic health records
2	Physiotherapy Exercise Classification with Single-Camera Pose Detection and Machine Learning	Colin Arrowsmith, David Burns, Thomas Mak 2, Michael Hardisty, and Cari Whyne	2018	The study only included exercises for the upper body and did not cover lower-body or full-body exercises. This may limit the applicability of the results to other types of exercises	Random Forest, Long Short Term Memory, Support Vector Machine	The system used a single camera to capture video of the patient performing the exercises, and a pose estimation algorithm to track the movements of the patient's body. The resulting pose data was then used to train a machine-learning model to classify the exercises.

5. Proposed System

1. Feature 1 : Personalized exercise plans

- The web app will use machine learning algorithms to generate personalized exercise plans for physiotherapy patients based on their medical history, fitness goals, and other relevant factors.

2. Feature 2 : User management

- The web app will include a user management system to allow patients to securely access and manage their exercise plans and progress.

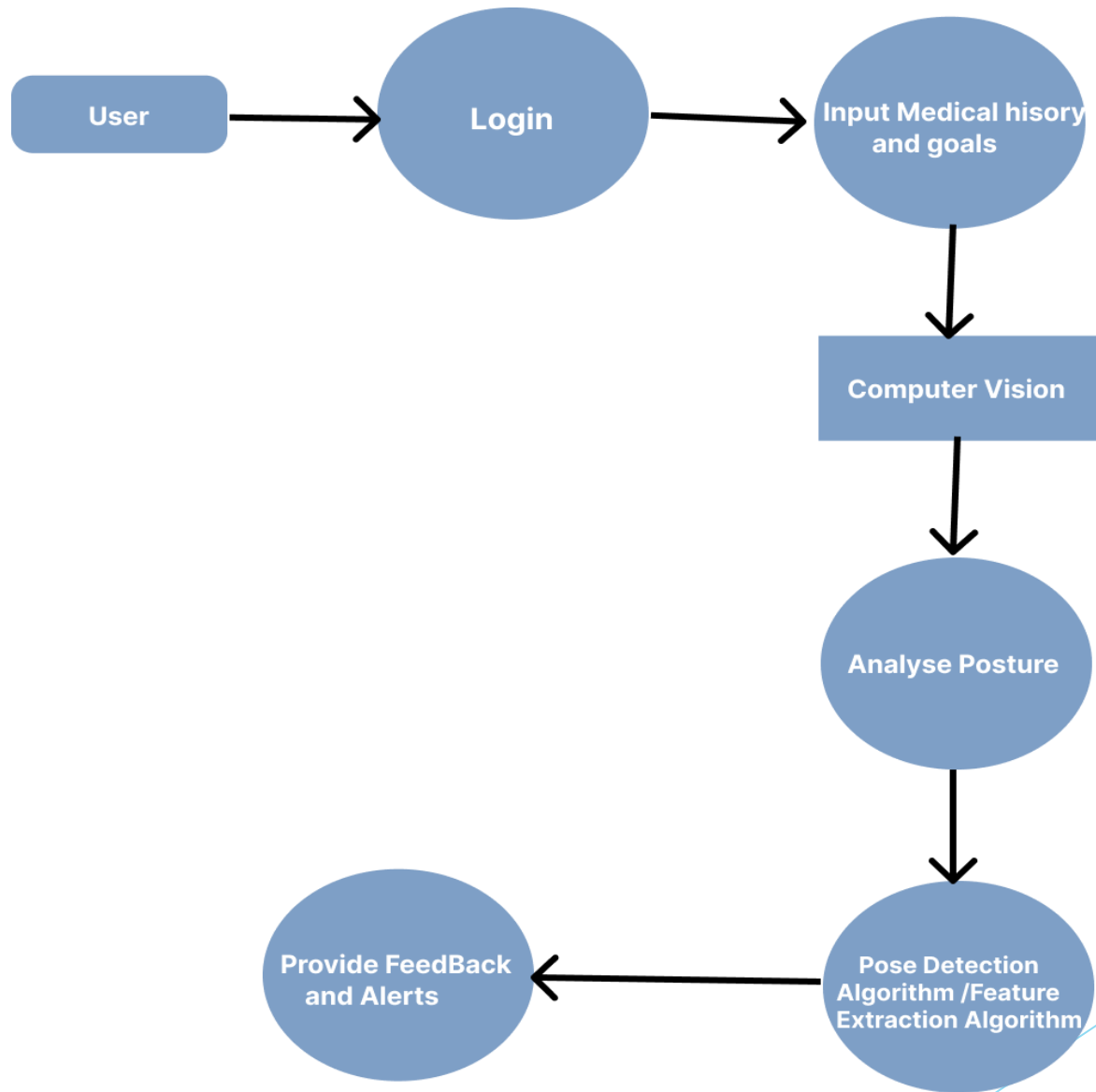
3. Feature 3 : Feedback system

- The web app will include a feature for patients to provide feedback on their exercises, which can be used to refine the machine learning algorithms and improve the accuracy of personalized exercise plans.

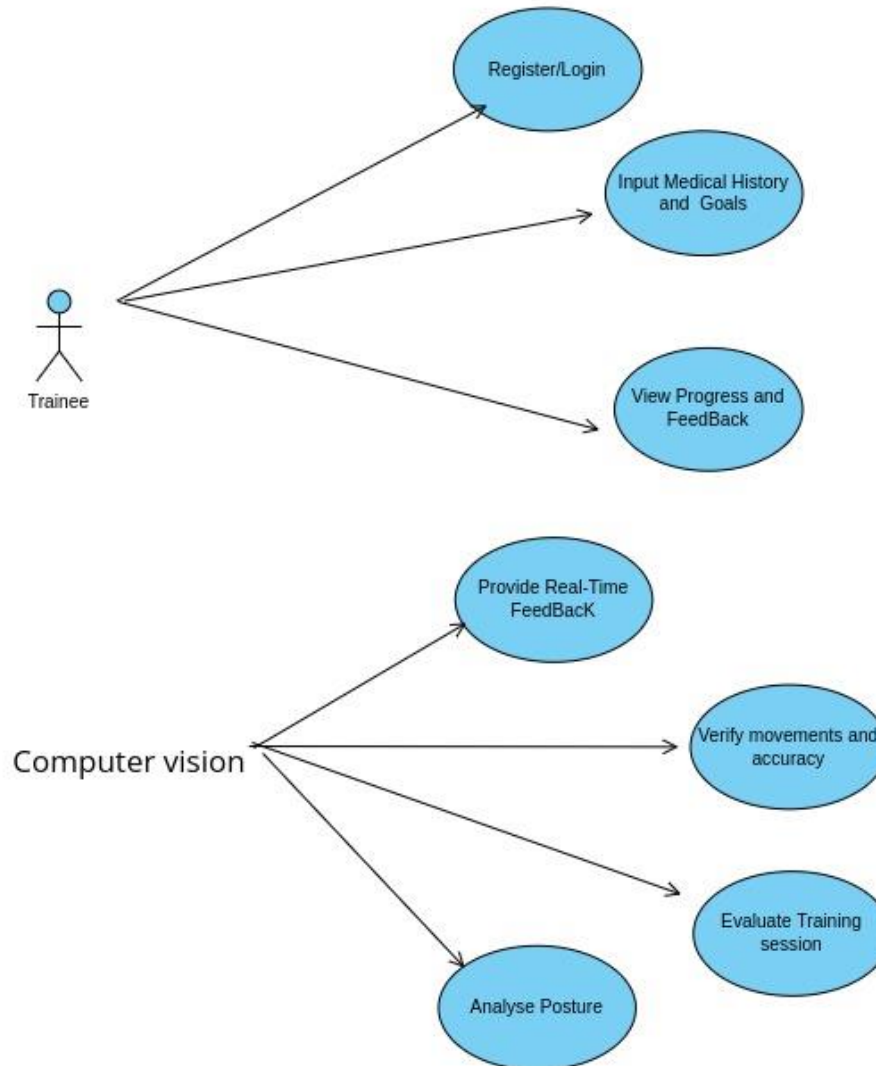
6. Outcome of Project

1. By generating personalized exercise plans based on each patient's unique needs and abilities, the web app could improve patient outcomes, such as reducing pain, increasing mobility, and improving overall physical health.
2. The web app could increase access to care for patients who are unable to access physiotherapy services in person, such as those living in rural or remote areas, or those who cannot afford traditional physiotherapy services.
3. By automating the process of designing personalized exercise plans, the web app could save time for patient, allowing them to focus on other aspects of their health.

7. Block Diagram



8. Use Case/Data Flow Diagram



9. Technology Stack

1. Front-end technologies:

- Kotlin and Android studio.

2. Machine learning libraries:

- TensorFlow, Scikit-Learn, or Keras for building and training machine learning models to generate personalized exercise plans.

Result and Discussion

- Machine learning algorithms will be used to provide personalized feedback and guidance.
- Computer vision techniques will analyze patient posture and movement during exercises.
- The machine learning model will be trained on a large dataset to identify common errors and provide tailored feedback.
- The model will continuously learn and adapt as more data is collected from patients.

Conclusion and Future Scope

Conclusion:

- The physiotherapist exercise web app using machine learning algorithms has the potential to revolutionize the field of physiotherapy.
- The app can offer personalized exercise plans to patients, reducing the time spent by physiotherapists on creating exercise plans.

Future Scope:

- Integration of real-time feedback and monitoring systems.
- Inclusion of video and multimedia content to aid patients in understanding and performing exercises correctly.

References

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Thank You...!!