Parshvanath Charitable Trust's
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)

Department of Computer Science & Engineering (AI & ML)

Disease Detector

Group members with Student Id:

Sahil Yadav(23106028)
Makrand Panchal(23106065)
Kunal Redij(23106067)
Pratik Pandit(23106134)

Project Guide

Ms. Yogeshwari Hardas

Introduction:

- Welcome to **Disease detector**, your trusted partner in health and well-being, where your health and are our top priorities.
- Our mission is to empower you with the tools and knowledge needed to detect potential diseases early and make informed decisions about your health.
- Our website combines advanced technology with user-friendly features to provide you with accurate and timely information about various diseases and health conditions. From tracking symptoms and identifying risk factors to offering personalized insights and guidance, we are here to support your journey toward better health.

- Our main aim for creating such a project was due to the casual mindset regarding our health that has been observed in people in todays date
- Most of us avoid visiting a doctor when as soon as they see normal disease symptoms thinking it would be normal cold or fever and avoid doctors fee.
- Without gaining proper knowledge, most of us try to deal with disease on our own.
- Our motivation stems from a deep commitment to enhancing lives through early disease detection and proactive health management.
- By this project we are only trying to help people to give a wakeup call about the possible threats they can face based on their current health symptoms
- To optimize efficiency, the platform will be designed with a streamlined, user-friendly interface that simplifies the disease detection process. Features like quick registration, intuitive navigation, and real-time updates on available disease will help users to get to know about disease faster

Literature Survey of the Existing System

Title	keywork	Challenges/ Insights
Artificial intelligence in disease diagnosis, J Ambient Intell Humaniz Comput.	The number of papers reviewed under preferred reporting items for systematic reviews and Meta-Analysis (PRISMA) guidelines for different types of diseases using AI from the year 2009 to the year 2020. The present work emphasizes various diseases and their diagnostics measures using machine and deep learning classifications.	Illness recognition errors in medication are reasonably regular, can have a stringent penalty, and are only now the foundation to materialize outstandingly in patient safety.
An artificial intelligence model for heart disease detection using machine learning algorithms, Victor chang	In this research, we develop a healthcare application to help detect heart diseases among patients and those with symptoms. Based on the random forest algorithm, our work provides better accuracies.	Traditional invasive-based approaches and angiography are also considered well-known appropriate techniques for diagnosing cardiac conditions in this study. It is a drawback in heart disease prediction.
Early Disease Detection and Prediction using AI Technologies: Approaches, Future Outlook, Mitigation Strategies, and Synthesis of Systematic Reviews Anita Dombale	This paper offers an extensive and perceptive analysis of the present state of healthcare prediction. It underscores the significant benefits that have arisen from the integration of artificial intelligence, emphasizing its positive impact.	AI plays a significant role in accurate disease diagnosis, healthcare anticipation, and analysis of health data by leveraging large-scale clinical records and reconstructing patients' medical histories

Literature Survey of the Existing System

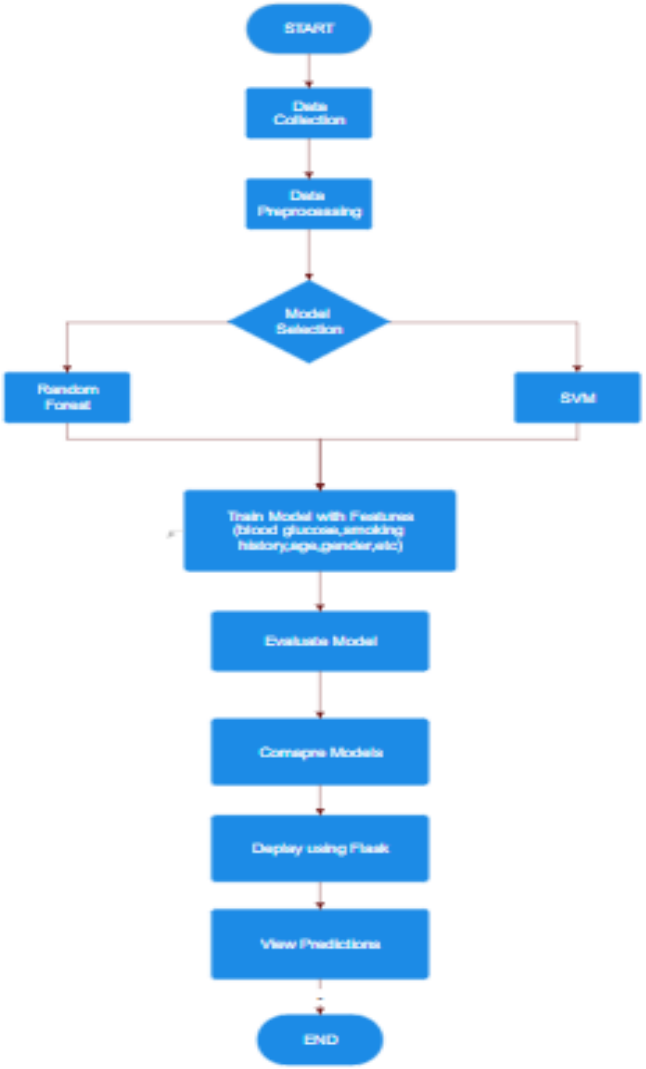
Title	Key Contribution	Challenges/ Insights
"Predicting Heart Disease Using Machine Learning Algorithms" (Davis et al., 2020)	Implements various ML algorithms (e.g., Random Forest, Logistic Regression) on clinical data to predict heart disease risk, demonstrating high predictive accuracy.	Data imbalance in training sets can affect model performance; integration into clinical workflows remains challenging.
"Diabetes Prediction Using Machine Learning: A Review" (Kaur et al., 2020)	Reviews various ML techniques, including neural networks and decision trees, to predict diabetes onset using datasets like PIMA Indians.	Issues with data privacy and security; varying quality and completeness of datasets hinder model training.
"Using Machine Learning to Predict Parkinson's Disease Progression" (Zhang et al., 2019)	Leverages historical patient data and machine learning techniques to predict disease progression, aiding clinicians in tailoring treatment plans based on individual risk profiles.	Data quality and completeness are essential; missing or incomplete data can lead to inaccurate predictions.

Problem statement:

- In the current landscape of health management, many individuals face significant challenges in accessing reliable and accurate disease detection tools. Existing disease detection websites often struggle with issues such as inconsistent diagnostic accuracy, complex user interfaces, inadequate data privacy. These problems undermine the effectiveness of disease detection platforms and create barriers for users seeking early diagnosis and proactive health management.
- **Key Issues:**

1. **Accuracy and Reliability:** Many platforms offer generalized or outdated information, leading to potential misdiagnoses or unnecessary anxiety.
2. **User Experience:** Complicated interfaces and navigation difficulties hinder effective use and engagement with the platform.
3. **Data Privacy and Security:** Inadequate security measures can compromise sensitive health information, eroding user trust.

System Design



Technologies and Methodologies

Frontend :

Html, css

Backend :

Flask

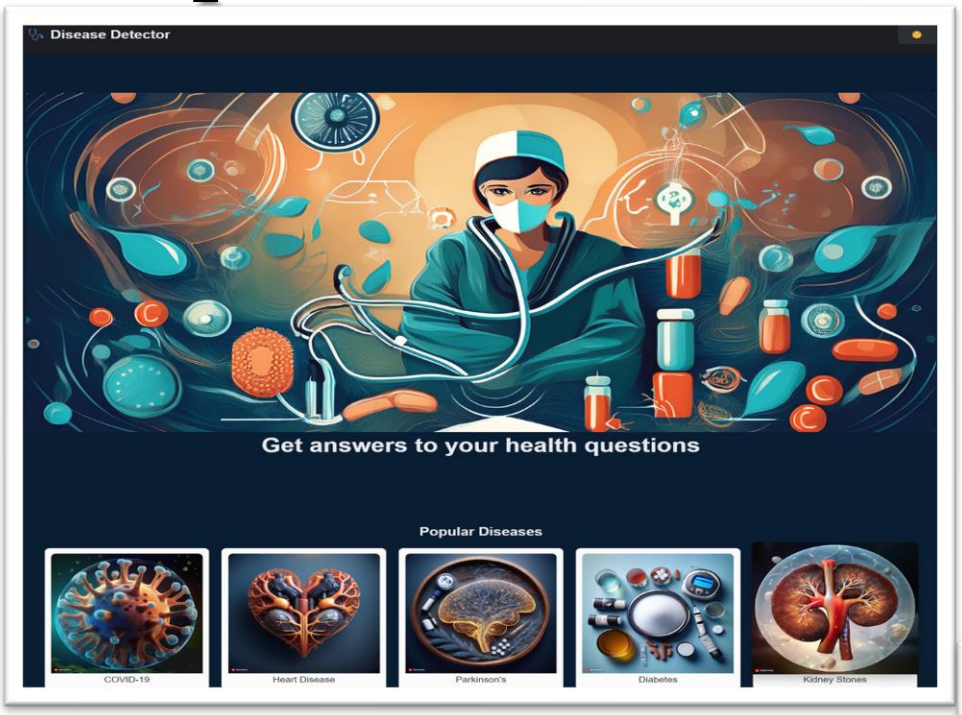
Machine learning models used :

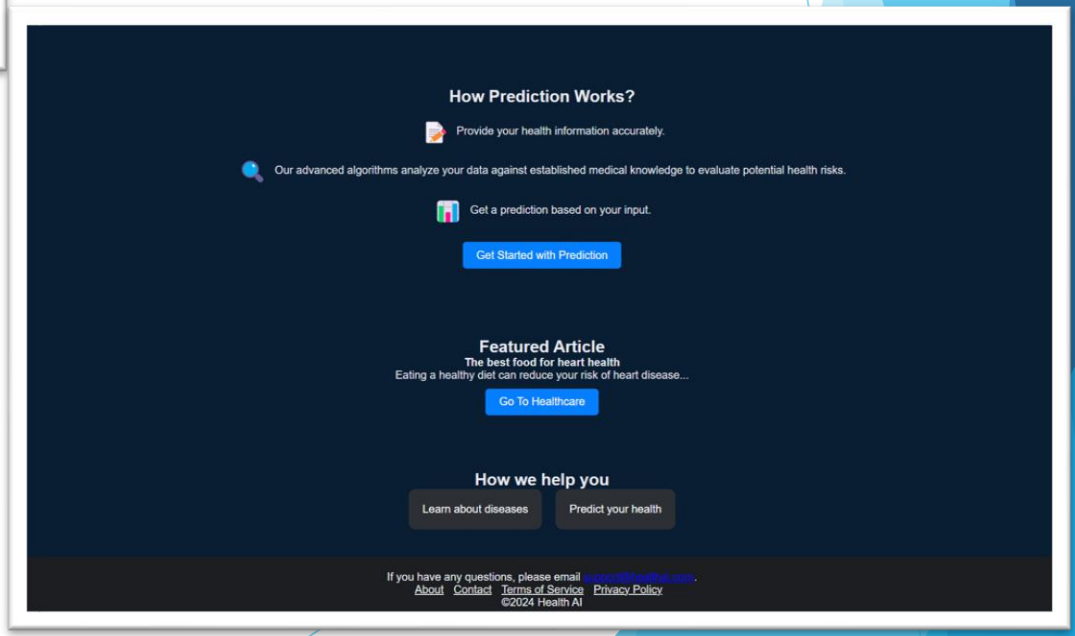
Random forest, Support vector machine learning

IDE:

Visual Studios code

Implementation Screenshots





Disease Detector

Parkinson's Disease | Heart Disease | Diabetes

Back to Home

Parkinson's Disease

Symptoms

- Tremors or shaking
- Slowed movement (bradykinesia)
- Muscle stiffness
- Impaired balance and posture
- Speech changes

Home Remedies

- Engage in regular physical exercise to improve balance and flexibility
- Practice relaxation techniques like yoga or tai chi
- Ensure a safe home environment to prevent falls
- Use mobility aids such as canes or walkers when necessary

Dietary Recommendations

Foods to Avoid	Why to Avoid	Foods to Include	Benefits
Processed foods high in fat and sugar	Can worsen symptoms and lead to weight gain	Fresh fruits and vegetables, especially leafy greens	Rich in antioxidants and vitamins
Excessive caffeine	Can increase anxiety and disrupt sleep	Foods rich in omega-3 fatty acids (e.g., fish, flaxseed, walnuts)	May help protect brain health
Salty foods	Can increase blood pressure	Whole grains (e.g., brown rice, quinoa, whole wheat bread)	Provide fiber and sustained energy
Alcohol	Can interact with medications	Lean protein sources (e.g., chicken, turkey, legumes)	Essential for muscle health
Red meat	High in saturated fats	Nuts and seeds for healthy fats	Support heart health
High-fat dairy products	Can contribute to inflammation	Low-fat dairy or dairy alternatives	Good sources of calcium
Fried foods	Can increase inflammation	Herbs and spices for flavor instead of salt	Add flavor and antioxidants

Recommended Exercises

- Walking: Helps improve balance and coordination.
- Stretching: Increases flexibility and reduces stiffness.
- Strength training: Builds muscle strength and improves mobility.
- Yoga: Enhances balance, flexibility, and relaxation.
- Tai Chi: A gentle form of martial arts that promotes balance and coordination.

Diabetes

Symptoms

- Increased thirst and frequent urination
- Extreme fatigue
- Blurred vision
- Slow-healing sores or frequent infections
- Areas of darkened skin

Home Remedies

- Maintain a healthy diet low in sugar and refined carbs
- Stay hydrated by drinking plenty of water
- Engage in regular physical activity
- Monitor blood sugar levels regularly

Dietary Recommendations

Foods to Avoid	Why to Avoid	Foods to Include	Benefits
Sugary drinks	Can spike blood sugar levels	Whole fruits (e.g., berries, apples)	Provide fiber and nutrients
White bread and pasta	High in refined carbs	Whole grains (e.g., brown rice, quinoa)	Help stabilize blood sugar
Processed snacks	Often high in sugar and unhealthy fats	Non-starchy vegetables (e.g., broccoli, spinach)	Low in calories and high in fiber
Full-fat dairy	Can be high in saturated fats	Lean proteins (e.g., chicken, turkey, fish)	Support weight management
High-fat meats	Can contribute to heart disease	Legumes (e.g., beans, lentils)	High in fiber and protein

Recommended Exercises

- Walking: Helps improve insulin sensitivity.
- Swimming: Low-impact and good for overall fitness.
- Cycling: Effective for cardiovascular health.
- Resistance training: Builds muscle and improves metabolism.
- Yoga: Reduces stress and promotes relaxation.

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Heart Disease

Symptoms

- Chest pain or discomfort (angina)
- Shortness of breath
- Fatigue
- Irregular heartbeat (arrhythmia)
- Swelling in the legs, ankles, or feet

Home Remedies

- Practice deep breathing exercises to reduce stress
- Engage in moderate aerobic exercises such as walking or swimming
- Maintain a healthy weight through proper diet and exercise
- Reduce stress through relaxation techniques like yoga or meditation

Dietary Recommendations

Foods to Avoid	Why to Avoid	Foods to Include	Benefits
High-sodium foods	Can raise blood pressure	Fruits and vegetables	Rich in vitamins and minerals
Saturated fats (e.g., fatty cuts of meat)	Can increase cholesterol levels	Whole grains (e.g., oats, brown rice)	Good source of fiber
Trans fats (e.g., fried foods, baked goods)	Harmful to heart health	Healthy fats (e.g., avocados, olive oil)	Support heart health
Excessive sugar	Can lead to obesity and diabetes	Lean protein sources (e.g., fish, chicken)	Essential for muscle health
Processed snacks and foods	Often high in sodium and unhealthy fats	Nuts and seeds	Provide healthy fats and protein

Recommended Exercises

- Aerobic exercises (e.g., brisk walking, cycling)
- Strength training (e.g., weight lifting)
- Flexibility exercises (e.g., stretching)
- Yoga or Pilates
- Swimming or water aerobics

Learn About Diseases

Home | Diabetes | Heart Disease | Parkinson's Disease

Diabetes

Diabetes is a chronic condition that occurs when the body cannot effectively regulate blood sugar levels. It can lead to serious health complications if not managed properly.

Input Information:

Input Feature	Where to Get Info
Age	Medical history or personal records
Heart Disease	Medical History
Hypertension	Blood pressure test results
BMI	Body measurements and health reports
HbA1c level	Blood test results
Blood glucose level	Blood glucose test results

Heart Disease

Heart disease refers to various conditions affecting the heart's structure and function, leading to serious health issues.

Input Information:

Input Feature	Where to Get Info
Age	Medical history or personal records
Hypertension	Blood pressure test results
BMI	Body measurements and health reports
Cholesterol levels	Blood test results
Blood glucose level	Blood glucose test results
Resting ECG	ECG test results
Maximum heart rate	Cardiac stress test results
Exercise angina	Medical evaluation during exercise
Oldpeak	Cardiac stress test results
Slope	Cardiac stress test results
Number of vessels	Fluoroscopy test results
Thalassemia	Blood test results

Parkinson's Disease

Parkinson's disease is a progressive neurological disorder that affects movement and can lead to various motor and non-motor symptoms.

Input Information:

Input Feature	Where to Get Info
MDVP:Fo(Hz)	Voice analysis reports
MDVP:Fhi(Hz)	Voice analysis reports
MDVP:Flo(Hz)	Voice analysis reports
MDVP:Jitter(%)	Voice analysis reports
MDVP:Jitter(Abs)	Voice analysis reports
MDVP:RAP	Voice analysis reports
MDVP:PPQ	Voice analysis reports
Jitter:DDP	Voice analysis reports
MDVP:Shimmer	Voice analysis reports
MDVP:Shimmer(dB)	Voice analysis reports
Shimmer:APQ3	Voice analysis reports
Shimmer:APQ5	Voice analysis reports
MDVP:APQ	Voice analysis reports
Shimmer:DDA	Voice analysis reports
NHR	Voice analysis reports
HNR	Voice analysis reports
RPDE	Voice analysis reports
DFA	Voice analysis reports
spread1	Voice analysis reports
spread2	Voice analysis reports
D2	Voice analysis reports
PPE	Voice analysis reports

Conclusion :

- Thank you for visiting Disease Detector, where cutting-edge technology meets healthcare innovation. Our disease detection platform is designed to empower you with the knowledge and tools you need to take charge of your health. By combining advanced algorithms, comprehensive data analysis, and user-friendly interfaces, we strive to provide accurate and timely insights into potential health conditions.
- Remember, while our technology offers valuable information, it is not a substitute for professional medical advice. Always consult with a healthcare provider for a complete diagnosis and personalized treatment plan.

References

- **References**
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- [1] **Topol, E. J. (2019).** *Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again*. Basic Books.
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- [3] **Bresnick, J. (2018).** "The Rise of AI in Symptom Checkers." *Journal of Medical Internet Research*, 20(6), e10110.
- [4] **Esteva, A., Kuprel, B., Novoa, R. A., et al. (2017).** "Dermatologist-Level Classification of Skin Cancer with Deep Neural Networks." *Nature*, 542(7639)
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- [5] **Rajkomar, A., Dean, J., & Kohane, I. (2019).** "Machine Learning in Medicine." *New England Journal of Medicine*, 380(14)

Thank You...!!