PATIENT HEALTH MONITORING USING IoT AND MACHINE LEARNING

A PROJECT REPORT

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ABSTRACT

In the dynamic landscape of healthcare, where precision and proactive management can dramatically alter outcomes, our project, "Patient Health Monitoring Using IoT and Machine Learning," plays a crucial role. Utilizing a combination of the Wokwi simulation platform and a Raspberry Pi WiFi module, this project orchestrated a sophisticated array of sensors—ranging from PIR and ultrasonic sensors to slide and rotary potentiometers, along with NTC temperature sensors—to meticulously collect real-time health data from patients. This data, updated every 30 seconds, is transmitted to the ThingSpeak cloud platform, ensuring seamless, continuous monitoring and analysis. The core of our innovation lies in leveraging powerful supervised learning algorithms such as Naive Bayes, Random Forest, SVM, Logistic Regression, and Decision Tree, implemented via Google Colab. These algorithms adeptly analyze data patterns to foresee potential health issues and inform actionable strategies for healthcare providers. Moreover, the insights derived from this analysis are elegantly presented on a user-friendly website hosted on Vercel, enhancing accessibility and transparency. Through this project, this project aim to underscore the transformative potential of integrating IoT and machine learning into healthcare, paving the way for more personalized, timely, and effective patient care.

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LIST OF ABBREVIATIONS

S NO.	ABBREVIATIONS	DEFINITIONS
1	**AI**	**A**rtificial **I**ntelligence
2	**ARM**	**A**dvanced **R**ISC **M**achine
3	**AWS**	**A**mazon **W**eb **S**ervices
4	**CSS**	**C**ascading **S**tyle **S**heets
5	**CSV**	**C**omma **S**eparated **V**alues
6	**EMR**	**E**lectronic **M**edical **R**ecords
7	**FN**	**F**alse **N**egative
8	**FP**	**F**alse **P**ositive
9	**GCP**	**G**oogle **C**loud **P**latform
10	**GDB**	**G**NU **D**e**b**ugger
11	**GPU**	**G**raphic **P**rocessing **U**nit
12	**GSM**	**G**lobal **S**ystem **M**obile
13	**HTML**	**H**yper **T**ext **M**arkup **L**anguage
14	**HTTP**	**H**yper **T**ext **T**ransfer **P**rotocol
15	**IFTT**	**I**f **T**his **T**hen **T**hat
16	**ICU**	**I**ntensive **C**are **U**nit
17	**IoT**	**I**nternet **o**f **T**hings
18	**KDC**	**K**ernel **D**ensity **E**stimate
19	**KNN**	**K**-**N**earest **N**eighbor
20	**LED**	**L**ight **E**mitting **D**iode
21	**MATLAB**	**M**atrix **LAB**oratory
22	**ML**	**M**achine **L**earning
23	**MQTT**	**M**essage **Q**ueuing **T**elemetry **T**ransport

24	**PDF**	**P**robability **D**ensity **F**unction
25	**PIR**	**P**assive **I**nfrared **S**ensor
26	**RESTful API**	**Re**presentation **S**tate **T**ransfer **A**pplication **P**rogramming **I**nterface
27	**RFID**	**R**adio **F**requency **Id**entification
28	**RISC-V**	**R**educed **I**nstruction **S**et **C**omputer
29	**ROI**	**R**eturn **O**n **I**nvestment
30	**SNS**	**S**ocial **N**etworking **S**ites
31	**SPI**	**S**erial **P**eripheral **I**nterface
32	**SVM**	**S**upport **V**ector **M**achine
33	**SSID**	**S**ervice **S**et **ID**entifier
34	**TCP**	**T**ransmission **C**ontrol **P**rotocol
35	**TPU**	**T**hermoplastic **P**olyurethane
36	**TP**	**T**rue **P**ositive
37	**TN**	**T**rue **N**egative
38	**UART**	**U**niversal **A**synchronous **R**eceiver /**T**ransmitter
39	**UDP**	**U**ser **D**atagram **P**rotocol
40	**UNO**	**U**nited **N**ations **O**rganization
41	**VS**	**V**isual **S**tudio **C**ode

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