**Multi-Disease Recognition**

Submitted for:

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1. **Abstract:**

Our project explores the potential of machine learning (ML) in identifying diseases, including heart disease, Parkinson's disease, and diabetes. With more healthcare data available than ever before, ML offers a promising technique to increase the accuracy and speed of disease identification, resulting in better patient outcomes. We investigate how different types of medical data can be used online for those at risk on a web-based app. By applying well-established ML algorithms, our goal is to predict when these diseases might develop, and enhance treatment guide options for those at risk

1. **Introduction:**

Heart disease, Parkinson’s, and diabetes are some of the biggest killers out there—and what’s scary is how many folks don’t even know they’re at risk until it’s almost too late. That’s why catching these diseases early and getting treatment fast can literally save lives. But here’s the bright side: Tech like AI, clever algorithms, and even your everyday fitness tracker are flipping the script. Imagine your watch not just tallying steps but catching health hiccups before they even hit your radar. That’s the whole idea here—using smarter gadgets and care that’s actually yours to help people live healthier, longer, without the curveballs.

1. **Methodology:**

We started by digging into heaps of research—think academic papers, case studies, and tech reports—to map out what’s working now (and what’s coming next) in tech that detects heart disease, Parkinson’s, and diabetes. We’re especially curious about how tools like AI, geeky algorithms, and even your everyday smartwatch could catch these diseases earlier or keep tabs on them over time. For example, could your fitness tracker flag a heart rhythm hiccup while you’re just walking the dog?

To figure this out, we compared old-school diagnostic methods (like blood tests or MRIs) to newer tech—basically asking, “Does this AI tool spot Parkinson’s subtle tremors better than a doctor’s eye?” We also didn’t gloss over the messy stuff: Who gets access to these tools? Could your health data get hacked? And would Grandma actually use a fancy app? The goal? To show how these innovations *could* work in real life—not just in a lab—without ignoring the real-world headaches

1. **Software Used:**To build and run these Multi-disease detection models for heart disease, Parkinson’s, and diabetes, here’s are the software going to use:

**Python Libraries:**

* NumPy (v1.26.3): Numeric Python used for cleaning and handling dataset
* scikit-learn (v1.3.2): used for training and testing
* Stream-lit (v1.29.0): This will host our site
* Stream-lit-option-menu (v0.3.6): Add navigation on site to make it more user friendly

**Tools & Setup:**

* Python: whole project will be coded using this
* IDE:  Jupyter Notebook for quick experiments and VS Code for final check
* Anaconda: for running jupyter notebook

1. **Experimental Results:**

Heart Disease:  
The usual suspects like random forests and SVMs stepped up big time. By training them on stuff like patient health records (cholesterol, age, etc.), they could sniff out heart disease with aim of 85% accuracy. For perspective, that’s like catching a problem before it becomes an ER trip—just by crunching numbers.

Parkinson’s:  
Turns out, how someone walks or the slight shake in their hands says a lot. We will fed movement data into simpler models like logistic regression and decision trees, and boom—they predicted Parkinson’s with aim of around 80-90% accuracy. That’s *before* most people would even notice something’s off.

Diabetes:  
Models trained on basics like glucose levels, BMI, and age were shockingly good at flagging diabetes risk. Gradient boosting stole the show here, aim to get ~90% accuracy for early detection. It’s like predicting rain before the clouds roll in—just way more science-y.

1. **Conclusions:**

A website that mixes AI brainpower with the step-counting gadget you’re already wearing—like your Fitbit or Apple Watch—to flag heart issues, Parkinson’s, or diabetes before they snowball into big problems. That’s what we’re trying to cook up here: a world where health alerts pop up right on your phone or laptop, not just in some clinic across town. Real talk—it’s like your tech finally starts looking out for you, not just counting your steps Think of it like having a health-conscious friend nudging you.  
  
The bottom line? This isn’t just about coding fancy algorithms. It’s about building something that actually works for real people. A tool that’s as easy to use as checking Instagram, but way more life-changing. If we nail the balance—tech that’s smart, private, and doesn’t leave anyone behind—we’re not just building an app. We’re building a bridge to a healthier world, one-click at a time**.**

1. **Future Scope:**

Grab data from all over the place: Hook your app up to gadgets like Fitbits, glucose monitors, *and* hospital records using secure digital pipelines—so the AI isn’t working blind. It sees the whole story without you typing a thing.

Ditch the one-size-fits-all advice: Create dashboards that *actually* get you. If your blood pressure’s been creeping up, it might toss you a heart-healthy recipe. Or if your stats scream “go see a doc,” it’ll nudge you to book that appointment.

Get alerts in real time, right in your browser: Imagine your webcam spotting a hand tremor during a video call—and your Parkinson’s risk score updates *before* you even hang up.

Scalability: Tweak the tech so even a $50 tablet or a clinic in the middle of nowhere with spotty Wi-Fi can run early diabetes checks. No fancy gear required

THANKS