

# MACHINE LEARNING BASED; IDIOPATHIC PARKINSONISM

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**Abstract:** In 21 Century where life of a normal human being is run the technologies and machines. It's almost impossible to think a day without technology and machines, humans are prone to more diseases and health conditions since they depend on machines and technology too much. Diseases like Parkinson's which as of now has no cure can be controlled and suppressed if detected early and treated. If diagnosed earlier huge changes can be brought in the person. The problem with diseases are both of these are very hard to identify in the starting stages. Using Piezo-resistive materials, Sensors can be fabricated which are very small in size. These can be installed on the inner walls of shoes in desired manner and data can be acquired with respect to change in resistance. This data can be further analyzed using Data Analysis and other suitable programming language for the job to be done. Finally, a pattern can be observed which reflects how the bearer walked the whole time and hence, required action can be taken based on the applications. By making use of our project it will be easier to identify these diseases and helps for faster and better diagnosis. The common symptoms of both these diseases are disorder in walking and our project tracks the orderliness or the disorderliness in the walking of a person and then analyses it which helps in identification of these disorders. The growth of data analytics and Data Science has put ourselves very much forward and since the project is also an application of data science, huge improvements can be made in the sports sector. An athlete's daily activities can be tracked and can be provided with feedback or a suggestive Data or graphs which help to improve the performance and fitness of an athlete. This can be considered as the applications of the Project.

## INTRODUCTION

Parkinson's disease is a neurodegenerative and intensifying disorder. The symptoms of this disease are classified into two types – motor and non-motor symptoms. Some of the motor symptoms are instability in posture, bradykinesia, tremor, etc. while on the other hand, the nonmotor symptoms are changes in body odor, sleep disorders, difficulty in swallowing and depression. The intensity of these symptoms differs from person to person. Amongst these two types of symptoms, non-motor symptoms are identifiable at an early stage. Hence detection of these symptoms helps in recognizing whether a person has Parkinson's disease at an early stage. Patients diagnosed with Parkinson's disease give out a distinguishable musky smell. The paper describes a non-intrusive and definite method for detecting Parkinson's disease through an individual's smell signatures. VOC sensors which determine the components in sweat were used to achieve this objective. The sensors were interfaced with Arduino UNO, which in turn gave the values of the different components of sweat in the Arduino programming software. The values of the various components of sweat obtained from people with Parkinson's disease and a healthy individual is compared. This comparison is used to determine whether that person is suffering from the disease.

The proposed system can be utilized by clinicians in their annual health check-ups without the usage of exorbitant diagnostic tools. It is a brain disorder that leads to shaking, stiffness and difficulty in walking, balance and coordination. Treatment is possible but can't cure this disease completely. It can be identified using piezo electric sensors which measure the walking disorder pattern and we can analyze the disease. It can also be identified using voc sensor which detects the amount of aromatic compounds. Detecting in the initial stages can control the disease to a certain extent using me dictation and life style changes.

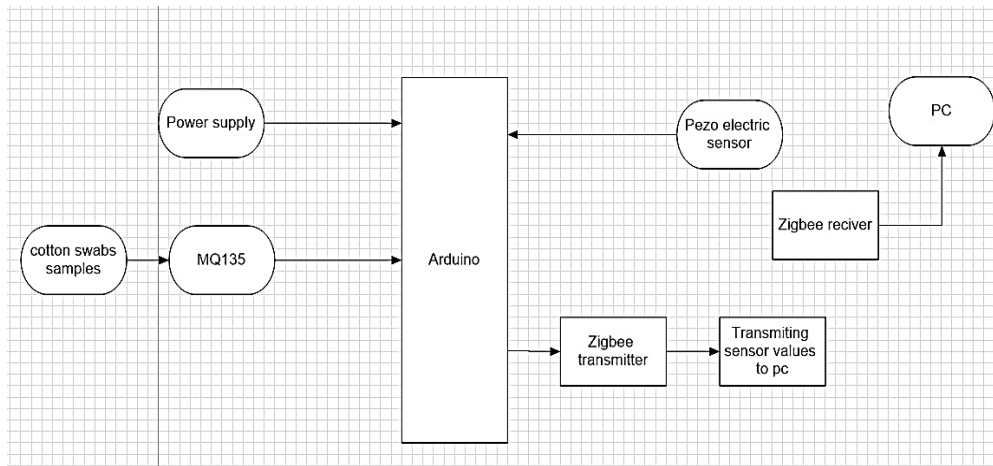
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Treatments and physiotherapy can be initiated at an early stage which can help in preventing further deterioration of neurons. The technique behind this proposed work is a reliable and a non-intrusive one. The device designed can be modified for analysis of other symptoms along with up gradation of sensors according to the results obtained. Currently such a system is not available in the market. The developed system will be helpful for neuro-physicians. In the near future, the system can also be made a part of the annual checkup of employees.

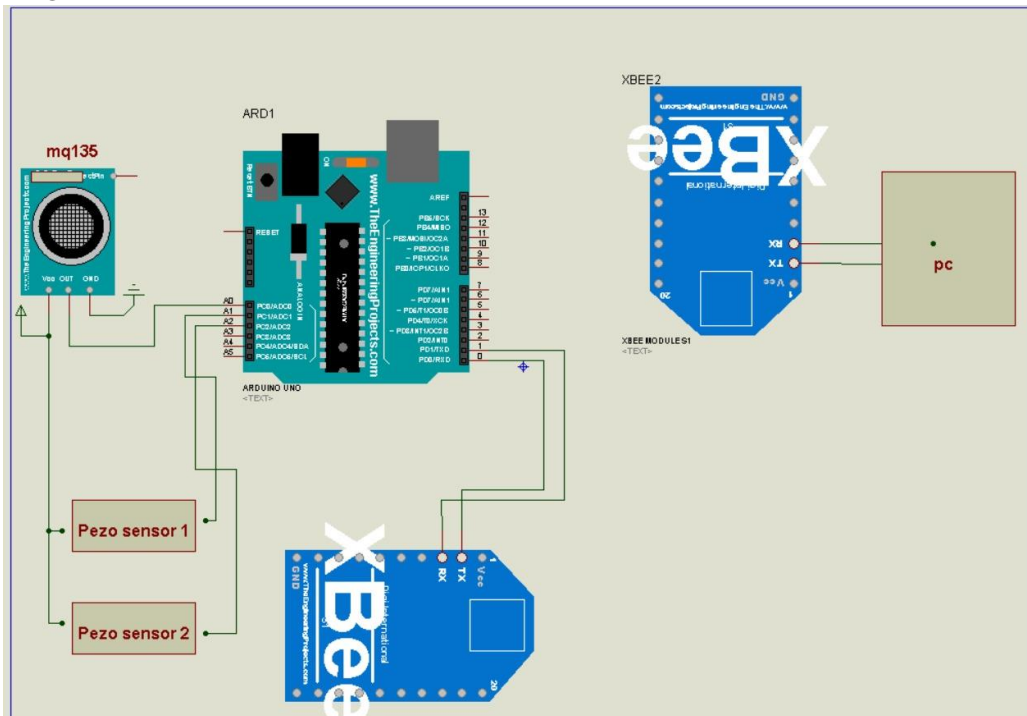
## PROPOSED SYSTEM:

In this system we are detecting the Parkinson disease in the initial stages itself. The main objective of the project is to identify the disease as soon as possible and to control it to certain extends with the help of meditation and other life style changes. As we know it is a disorder of central nervous system which effects our movement and leads to shaking, stiffness, and difficulty in walking, speech and balancing problems. The system uses piezo electric sensors which measure the walking disorder pattern and the gas sensor detects the presence of aromatic compounds. The values from these sensors are collected by arduino is analyzed in PC which is wirelessly transmitted through zigbee transmitter and receiver. Till now there is no such existing system to detect the disease makes this system more relevant.

## BLOCKDIAGRAM



## CIRCUIT DIAGRAM



### Section 1: smell detection

System is based on the investigation of the smell signatures of healthy individuals and Parkinson's affected patients. The Parkinson's affected patients give out a distinct smell/odor in contrast to normal individuals. This odor is mainly due to presence of aromatic compounds. The system aims to detect the components of the individual's sweat and determine based on the levels of the components whether the individual suffers from Parkinson's disease.

**Section 2: Analyzing Walking Pattern of a Person**

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**PROS AND CONS:**

Help to prevent further deterioration of neurons, Early detection of disease, Highly flexible usage as a same set can be used for a kid as well as senior citizen, Easy implementation & set up, It can be used to improve the performance of athletes. The readings depend on the accuracy of the sensor.

**CONCLUSION:**

Treatment of Parkinson's disease become challenging as time progress. The Parkinson's disease was first described almost two centuries ago. The developed system will be help full for neuro physician's .It is only recently that we have to understand the complex nature of the functional benefits early diagnosis of Parkinson's disease is extremely helpful. Treatments and physiotherapy can be initiated at an early stage which can help in preventing further deterioration of neurons. The technique behind this proposed work is a reliable and a non-intrusive one. Software part of the system is carried out using Arduino. The developed system will be helpful for neuro-physicians. In the near future, the system can also be made a part of the annual checkup of employees.

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Parkinson's symptoms usually begin gradually and get worse over time. As the disease progresses, people may have difficulty walking and talking. They may also have mental and behavioral changes, sleep problems, depression, memory difficulties, and fatigue. Both men and women can have Parkinson's disease. However, the disease affects about 50 percent more men than women. One clear risk factor for Parkinson's is age. Although most people with Parkinson's first develop the disease at about age 60, about 5 to 10 percent of people with Parkinson's have "early-onset" disease, which begins before the age of 50. Early-onset forms of Parkinson's are often, but not always, inherited, and some forms have been linked to specific gene mutations. Parkinson's disease occurs when nerve cells, or neurons, in an area of the brain that controls movement become impaired and/or die. Normally, these neurons produce an important

chemical known as dopamine. When the neurons die or become impaired, they produce less dopamine, which causes the movement problems of Parkinson's. Scientists still do not know what causes cells that produce dopamine to die. In Parkinson's disease, certain nerve cells (neurons) in the brain gradually break down or die. Many of the symptoms are due to a loss of neurons that produce a chemical messenger in your brain called dopamine. When dopamine levels decrease, it causes abnormal brain activity, leading to impaired movement and other symptoms of Parkinson's disease.

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