# PROJECT SYNOPSIS ON

**KNEE OSTEOARTHRITIS DETECTIONANDITS SEVERITY**

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF DEGREE OF

## BACHELOR OF TECHNOLOGY IN

**INFORMATION TECHNOLOGY**



**Submitted By:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:** | **Akhil Katyal** | **Anmol Sehdev** | **Ishita Seth** |
| **University Roll No.** | **1903815** | **1903819** | **1903835** |

**Group No. 4**

**Under the supervision of**

**Mr. Jaswinder Singh Dhillon**

**Assistant Professor (IT)**

## DEPARTMENT OF INFORMATION TECHNOLOGY

## DAV INSTITUTE OF ENGINEERING & TECHNOLOGY

**Jalandhar – 144008**

### Project Overview

### Disease word itself build-up of two words dis-ease, which implies the discomfort. Essentially, a distortion in human beings or any other living things is known as a disease. It is a foreign or stage that work stoppages or endures on living things [1],[2].

Acute diseases are very common and sudden onset of symptoms. These diseases are severe in nature and recover in few days e.g. acute leukemia, common cold whereas Chronic disease are progressive in nature and take long time for recovery e.g. Arthritis, chronic respiratory problems, diabetes etc. Arthritis word is a combination of "Arth" & "itis. The word “Arth” comes from a Greek word árthron which means joint and the itis is also derived from the Greek language and used as a suffix and means the inflammation in the human body. So, when both the terms are combined means it became arthritis it directly implies to joint's inflammation. Further, the Inflammation = pain + stiffer joints + swelling + redness of the joints.

Osteoarthritis (OA) is a common disease which constitutes the fourth leading cause of disability worldwide. According to the US National Health Interview Survey, up to 14 million American people are considered to have a symptomatic knee, with additional tens of millions affected as well in Europe, South America, Asia, or Middle East. As a consequence of ensuing healthcare expenditures and losses of activity, the economic burden associated with OA is estimated to represent up to 2.5% of Growth National Product in Western countries.Every disease has some intellects, symptoms or manifestation. For example, if a mortal is suffering from fever the symptoms might include the body temperature, headache, restlessness and impatience. Which is the reason of the discomfort from which an individual must go through [3], [4], [5]

Knee Osteoarthritis (OA) is a destructive joint disease identified by joint stiffness, pain, and functional disability concerning millions of lives across the globe. It is generally assessed by evaluating physical symptoms, medical history, and other joint screening tests like radiographs, Magnetic Resonance Imaging (MRI), and Computed Tomography (CT) scans. Unfortunately, the conventional methods are very subjective, which forms a barrier in detecting the disease progression at an early stage.

Knee Osteoarthritis (KOA) is one of the most common degenerative diseases affecting elderly people in the world, it can limit the mobility of a person affecting daily life activities and even causing early retirement (Lespasio, M., 2017). Lim, K. Lau, C. S. (2011) predicts that this type of degenerative joint disease disorder will affect at least 130 million people across the world by 2050, of whom 40 million will be severely disabled by this condition. Moreover, when the disease is at the last stage the only treatment is a total knee replacement. So, it is recommended to identify Knee Osteoarthritis at first stages to avoid knee this medical procedure. Knee Osteoarthritis (KOA) diagnosis depends on several criteria, for instance, Luyten, F. P. et al. (2012) proposed the criteria for early diagnosis of KOA as follows: I. Pain in the knee II. Radiographic grading based on Kellgren-Lawrence grade.

### 2.0 Existing System

In today’s world there are various websites available which gives us all the information regarding various problems that the world is facing, every sort of information is actually available be it from the symptoms to the causes causing various problems but yet there are very less or no reliable and personalized systems available online for this particular issue which tells patients about the problems and its severity prior at the comfort of their home.

### ProposedSystem

Python and Django based web application to get information about knee osteoarthritis detection and the severity of the problem.

#### ProblemFormulation

Arthritis is a disorder that causes swelling, tenderness, inflammation, stiffness etc. in one or more joints. Arthritis is more common in older people and typically worsens with age. While there are many different types of arthritis with different causes and treatments, osteoarthritis is the most prevalent. Osteoarthritis is estimated to affect nearly 237 million people globally, this accounts for almost 3.3% of the human population. Although as of now there is no known cure for arthritis, the benefits of early detection can’t be understated. The Knee Osteoarthritis Detection helps patients detect Osteoarthritis in their knees. Along with helping with early detection, this web application also detects the severity of the disorder.

#### Objectives

To carry out the current work, research objectives were identified, and they are outlined as follows.

* Investigate the state-of-the-art related to prediction of Knee Osteoarthritis based on clinical and imaging data.
* Implement and evaluate machine learning models based on clinical data.
* Implement and evaluate deep learning models based on imaging data.
* Merge the two methods and evaluate the performance.

### Features of the Project

* Helps with instantly detecting signs of Osteoarthritis in knees.
* This system even informs about the severity of arthritis.
* Easy to use.
* Personalized results.

### 5.0 Facilityrequired

#### 5.1 HardwareRequirements:

* Processor –Core i3 or above
* Hard Disk – 160 GB
* Memory – 1GB RAM
* Monitor
  1. **SoftwareRequirements:**
* Windows 7 or higher
* Python
* Django framework
* MySQL database
  1. **Project Planning**

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| --- | --- | --- | --- |
| **Name of the Activity** | **Date of Completion** | **Deliverables** | **Name of Team member** |
| **Requirement Analysis** |  | **SRS Document** | Ishita Seth |
| **Design** |  | **Design Document** | Akhil Katyal |
| **Coding** |  | **Software Code (Prototype)** | Anmol Sehdev |
| **Testing** |  | **Test document** | Ishita Seth |
| **Implementation** |  | **Final project demonstration** | Anmol Sehdev |

### References

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[3] Kusumaningtyas, EntinMartiana, Ali RidhoBarakbah, Aditya AfganHermawan, and Silvia Rulia Candra. "Auto cropping for application of heart abnormalities detection through Iris based on mobile devices." In 2017 International Electronics Symposium on Knowledge Creation and Intelligent Computing (IES-KCIC), pp. 108- 113. IEEE, 2017.

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[5] Meenakshi Sharma, Sanjay Kumar Singh, Prateek Agrawal, Vishumadaan, “Classification of Clinical Dataset of Cervical Cancer using KNN”, Indian Journal of Science and Technology, 9(28), pp.1-5, July 2016.

### (Signature) (Signature)

**TeamLeader (ProjectGuide)**

Date: