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VANET BASED PRIVACY PRESERVING COMMUNICATION SCHEME

Dr. V. Vijayakumar[1], D.Saravanan, M.E.[2],
[1]*Head of the Department of Computer Science and Engineering, AVS Engineering College, Salem.*
[1]*Research Scholar, Department of Computer Science and Engineering, AVS Engineering College, Salem, Tamilnadu.*

ABSTRACT
In this project, we propose a framework for privacy-preserving outsourced drug discovery in the cloud, which we refer to as POD. Specifically, POD is designed to allow the cloud to securely use multiple drug formula providers' drug formulas to train Support Vector Machine (SVM) provided by the analytical model provider. In our approach, we design secure computation protocols to allow the cloud server to perform commonly used integer and fraction computations. To securely train the SVM, we design a secure SVM parameter selection protocol to select two SVM parameters and construct a secure sequential minimal optimization protocol to privately refresh both selected SVM parameters. The trained SVM classifier can be used to determine whether a drug chemical compound is active or not in a privacy-preserving way. Lastly, we prove that the proposed POD achieves the goal of SVM training and chemical compound classification without privacy leakage to unauthorized parties, as well as demonstrating its utility and efficiency using three real-world drug datasets.

CHAPTER 1
INTRODUCTION

Advancements in computational science have accelerated drug discovery and development. Artificial intelligence (AI) is widely used in both industry and academia. Machine learning (ML), an essential component in AI, has been integrated into many fields, such as data generation and analytics. The basis of algorithm-based techniques, such as ML, requires a heavy mathematical and computational theory. ML models have been used in many promising technologies, such as deep learning (DL) assisted self-driving cars, advanced speech recognition, and support vector machine-based smarter search engines . The advent of these computer-assisted computational techniques, first explored in the 1950s, has already been used in drug discovery, bioinformatics, cheminformatics, etc. Drug discovery has been based on a traditional approach that focuses on holistic treatment. In the last century, the world's medical communities started to use an allopathic approach to treatment and recovery. This change led to the success of fighting diseases, but high drug costs ensued, becoming a healthcare burden. While quite diverse and specific to candidates, the cost of drug discovery and development has consistently and dramatically increased . The generalized components of early drug discovery include target identification and characterization, lead discovery, and lead optimization. Many computer-based approaches have been used for the discovery and optimization of lead compounds, including molecular docking , pharmacophore modeling ,decision forests , and comparative molecular field analysis . ML and DL have become attractive DL have become attractive approaches to drug discovery. The applications of ML and DL algorithms in drug discovery are not limited to a specific step, but for the whole process.

CHAPTER 2
SYSTEM ANALYSIS

In this phase a detailed appraisal of the existing system is explained. This appraisal includes how the system works and what it does. It also includes finding out in more detail- what are the problems with the system and what user requires from the new system or any new change in system. The output of this phase results in the detail model of the system. The model describes the system functions and data and system information flow. The phase also contains the detail set of user requirements and these requirements are used to set objectives for the new system.

EXISTING SYSTEM

There are many prevalent systems used for Drug disease prediction. The existing systems only predict the drug diseases. The various approaches used for predicting drugs is by using Machine Algorithms such as Naïve Bayes, Decision Tree, Random Forest, k-mean algorithm. Also, one of the approaches to build a drug prediction system is by using Big Data. Prediction using traditional disease risk model usually involves Machine Learning and supervised learning algorithm which uses training data with the labels for the training of the models.

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DISADVANTAGES

- Risk for progression to Drug Prediction failure.
- failure in patients in india and nature of medical treatment to be prescribed.

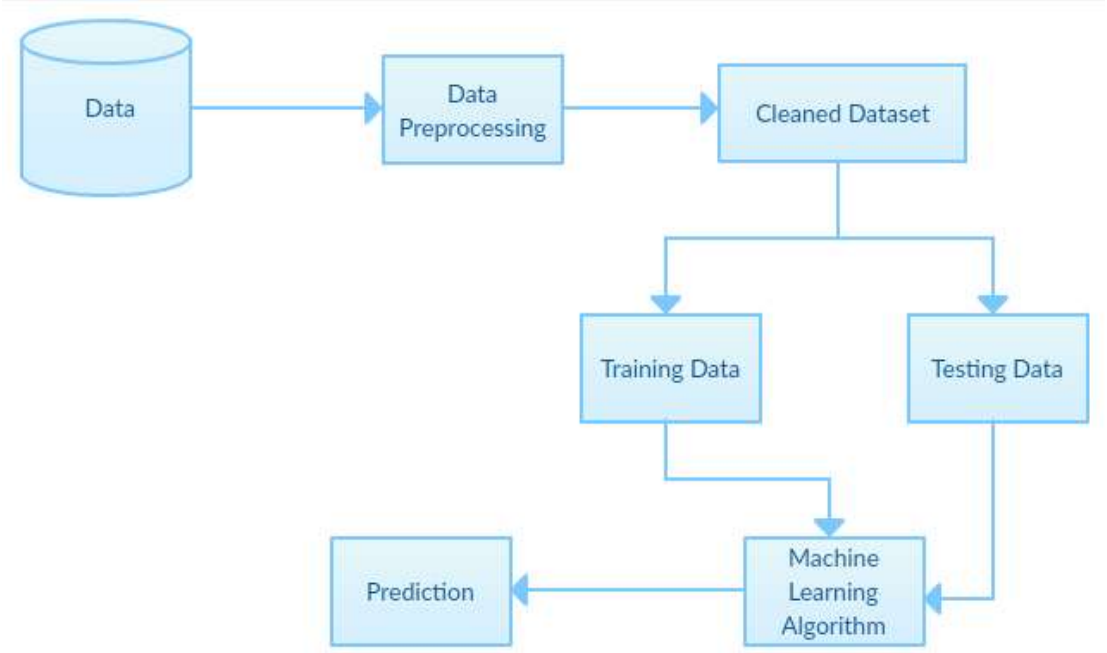
PROPOSED SYSTEM

The machine learning techniques that are accustomed answer the drug discovery questions covered during this Review. a variety of supervised earning techniques (regression and classifier methods) are wont to answer questions that need prediction of knowledge categories or continuous variables, whereas unsupervised techniques are wont to develop models that enable clustering of the info. ADME, absorption, distribution, metabolism and excretion; CNN, convolutional neural network; CT, computed tomography; DAEN, deep auto encoder neural network; DNN, deep neural network; GAN, generative adversarial network; MRI, resonance imaging; NLP, tongue processing; PK, pharmacokinetic; RNAi, RNA interference; RNN, recurrent neural network; SVM, support vector machine; SVR, support vector regression.

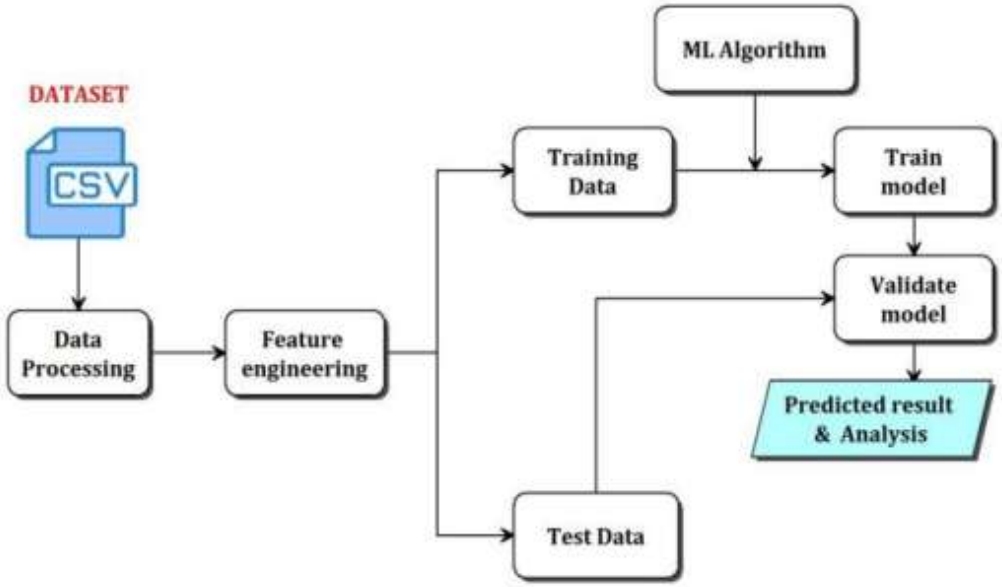
ADVANTAGES

- Procedure for stage expectation are the significant techniques.
- Their exactness and accuracy.
- Taken care of into the classifier named SVM,
- Dataset comprises of qualities and qualities.

ARCHITECTURE DIAGRAM



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CHAPTER 3
LITERATURE SURVEY

A literature review is an account of what has been published on a topic by accredited scholars and researchers. Occasionally you will be asked to write one as a separate assignment, but more often it is part of the introduction to an essay, research report, or thesis. In writing the literature review, your purpose is to convey to your reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. As a piece of writing, the literature review must be defined by a guiding concept (e.g., your research objective, the problem or issue you are discussing or your argumentative thesis). It is not just a descriptive list of the material available, or a set of summaries

Besides enlarging your knowledge about the topic, writing a literature review lets you gain and demonstrate skills in two areas

1. **INFORMATION SEEKING:** the ability to scan the literature efficiently, using manual or computerized methods, to identify a set of useful articles and books
2. **CRITICAL APPRAISAL:** the ability to apply principles of analysis to identify unbiased and valid studies.

ANTIBIOTIC RESISTANCE: A RUNDOWN OF A GLOBAL CRISIS

The advent of multidrug resistance among pathogenic bacteria is imperiling the worth of antibiotics, which have previously transformed medical sciences. The crisis of antimicrobial resistance has been ascribed to the misuse of these agents and due to unavailability of newer drugs attributable to exigent regulatory requirements and reduced financial inducements. Comprehensive efforts are needed to minimize the pace of resistance by studying emergent microorganisms, resistance mechanisms, and antimicrobial agents. Multidisciplinary approaches are required across health care settings as well as environment and agriculture sectors. Progressive alternate approaches including probiotics, antibodies, and vaccines have shown promising results in trials that suggest the role of these alternatives as preventive or adjunct therapies in future. Antibiotic resistance is ancient and the “resistome” is a dynamic and mounting problem. Causes of the global resistome are overpopulation, enhanced global migration, increased use of antibiotics in clinics and animal production, selection pressure, poor sanitation, wildlife spread, and poor sewerage disposal system.1,2 Antibiotic treatment is one of the main approaches of modern medicine which is used to combat infections. The “golden era” of antibiotics ranged from the 1930s to 1960s which gave rise to many antibiotics.3 Unfortunately, this era ended because researchers were unable to maintain the pace of antibiotic discovery in the face of emerging resistant pathogens. Persistent failure to develop or discover new antibiotics and non judicious use of antibiotics are the predisposing factors associated with the emergence of antibiotic resistance.4 Antimicrobial resistance (AMR) poses a serious global threat of growing concern to human, animal, and environment health. This is due to the emergence, spread, and persistence of multidrug-resistant (MDR) bacteria or “superbugs.”5 MDR bacteria exist across the animal, human, and environment triangle or niche and there is interlinked sharing of these pathogens in this triad. The plausible causes of “the global resistome” or AMR include excessive use of antibiotics in animals (food, pets, aquatic) and humans, antibiotics sold over-the-counter, increased international travel, poor sanitation/hygiene, and release of no metabolized antibiotics or their residues into the environment through manure/feces.

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DRUG REPOSITIONING: OLD DRUGS FOR NEW INDICATIONS

The process of finding new uses of existing drugs outside the scope of the original indication is known as drug repositioning. Drug repositioning is a low risk, high reward strategy as compared to the de novo drug discovery. New drug discovery is a very costly and time consuming process. It is associated with high failure rates, high cost, poor safety and bioavailability, limited efficacy, lengthy design and testing process. Now many pharmaceutical companies are trying to reposition the existing drugs for various indications. It is less costly, less time consuming and relatively safe method. Though there are intellectual property(IP) related issues, which can hinder the repositioning process. There are many examples of drugs, which are successfully repositioned.

1. Drug focus:

Structural features of molecules already approved for particular indications can help to identify active compounds that were originally developed for different indications. It is based on the concept that single drug often interacts with multiple targets. e.g. Repositioning of sildenafil, previously used to treat angina, in erectile dysfunction.

2. Target focus:

To find new indications when primary and/or secondary targets of compounds are known, implies that targets relevant to one disease or biological process are often involved in several biological processes. e.g. repositioning of aspirin as an antithrombotic therapy following identification of its action against prothrombic thromboxane A2 activity in platelets

3. Disease focus:

Experimental data related to disease (e.g. omics data collected from patients) or knowledge on how drugs modulate phenotypes related to disease (e.g. known from their side effects) is utilized in disease focused approaches.e.g. Sunitinib and dasatinib for breast cancer brain metastases.

CHAPTER 4
SYSTEM SPECIFICATION

The purpose of system requirement specification is to produce the specification analysis of the task and also to establish complete information about the requirement, behavior and other constraints such as functional performance and so on. The goal of system requirement specification is to completely specify the technical requirements for the product in a concise and unambiguous manner.

HARDWARE SPECIFICATION

Processor	:	Pentium Core i3 2.4 Ghz
RAM	:	4 GB
Hard disk	:	500 GB
FDD	:	1.44MB
Monitor	:	14 inch
Mouse	:	3 Button scroll
CD Drive	:	52 X

SOFTWARE SPECIFICATION

Operating System	:Windows 8
Language	: PYTHON

CHAPTER 5
IMPLEMENTATION

Implementation is the stage of the project when the theoretical design is turned out into a working system. Thus it can be considered to be the most critical stage in achieving a successful new system and in giving the user, confidence that the new system will work and be effective.

The implementation stage involves careful planning, investigation of the existing system and it's constraints on implementation, designing of methods to achieve changeover and evaluation of changeover methods.

MODULES

- **Data Gathering and Preprocessing**
- **Feature Selection and Data Preparation**
- **Model Construction and Model Training**
- **Model Verification and Outcome Evaluation**

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TESTING AND IMPLEMENTATION

Software Testing is the process of executing software in a controlled manner, in order to answer the question - Does the software behave as specified?. Software testing is often used in association with the terms verification and validation. Validation is the checking or testing of items, includes software, for conformance and consistency with an associated specification. Software testing is just one kind of verification, which also uses techniques such as reviews, analysis, inspections, and walkthroughs. Validation is the process of checking that what has been specified is what the user actually wanted.

Validation : Are we doing the right job?
Verification : Are we doing the job right?

Software testing should not be confused with debugging. Debugging is the process of analyzing and localizing bugs when software does not behave as expected. Although the identification of some bugs will be obvious from playing with the software, a methodical approach to software testing is a much more thorough means for identifying bugs. Debugging is therefore an activity which supports testing, but cannot replace testing.

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