COASTAL FLOOD PREDICTION USING ML MODEL ANN

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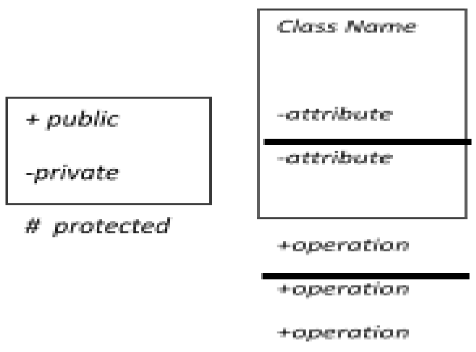
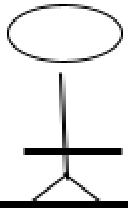
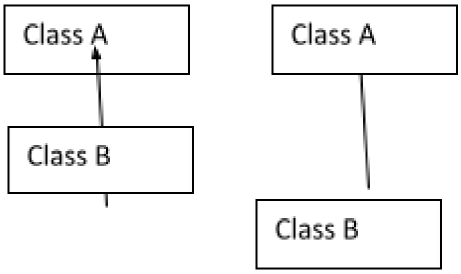
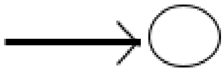
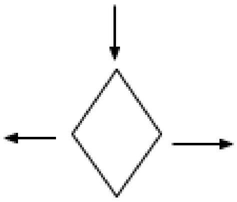
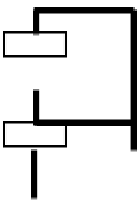
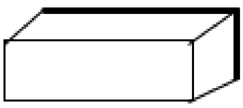
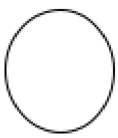
LIST OF FIGURES

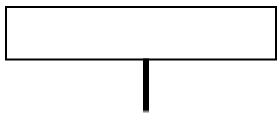
LIST OF SYMBOLS

S.NO	**NOTATION NAME**	**NOTATION**	**DESCRIPTION**
1.	Class		Represents a collection of similar entities grouped together.
		NAME 	

2.	Association		Associations represent static relationships between classes. Roles represent the way the two classes see each other.
3.	Actor		It aggregates several classes into a single class.
4.	Aggregation		Interaction between the system and external environment

5.	*Relation* (uses)	*uses*	Used for additional process communication.
6.	Relation (extends)	EXTENDS	An Extended relationship is used when one use case is similar to another use case but does a bit more.
7.	Communication		Communication between various use cases.
8.	State		State of the process.

9.	Initial State		Initial state of the object
10.	Final state		Final state of the object
11.	Control flow		Represents various control flows between the states.
12.	Decision box		Represents decision making process from a constraint
13.	Use case		Interaction between the system and external environment.
14.	Component		Represents physical modules which are a collection of components.
15.	Node		Represents physical modules which are a collection of components.
16.	Data Process/State		A circle in DFD represents a state or process which has been

			triggered due to some event or action.
17.	External entity		Represents external entities such as keyboards,sensors,etc.
18.	Transition		Represents communication that occurs between processes.
19.	Object Lifeline		Represents the vertical dimensions that the object communicates with.
20.	Message	Message 	Represents the message exchanged.

COASTAL FLOOD PREDICTION USING ML MODEL ANN

1. **Abstract:**

The most dangerous and destructive natural disasters are floods. The floods will cause damage to not only the surroundings, they will affect human daily life too. The flood prediction models will reduce the risk management, loss of human life and these predictive models will help to reduce the financial property damages caused by floods. To reduce the manual mathematical calculations which are followed

throughout the past few years by hydrologists and meteorological departments by introducing and using these neural network methods the decisions and prediction on floods would be precisely known and the cost and time would be saved. By using the neural network techniques which are used to work on the rainfall data set and meteorological data hub this problem can be prevented. For the purpose of data cleaning, identifying the outliers, unwanted data and for clearing the noisy data the data analysis has to be done by a Multilayer perception Classifier (MLP). This has to be done for all the dataset collected. The performance has to know if the flood can happen or not by evaluating and identifying the confusion matrix and the result will be displayed or shown in a flask-based application.

KEY WORDS: Multilayer Perception Classifier (MLP), Artificial Neural Network (ANN), Support Vector Machine (SVM), Terrain Analysis Using Digital Elevation Models (TAUDEMS), Support Vector Classifier (SVC)

2. EXISTING SYSTEM

The early analysis of current evolving and advancing alarm floods examine systems in industry are very important to provide precise information and a safe operation. It will provide instant decision support instead of waiting for the alarm to end. An approach has been proposed to solve the problem with the unlabeled historical data. A vector representation is called an Exponentially Attenuated Component to show or represent the alarm floods, to prioritize the information of prior activated alarms. A semi-supervised approach based on GMM was proposed to communicate the problem of prior classification of currently evolving alarm floods with unlabeled historical data. The exponentially attenuated component (EAC) was used to change the alarm flood sections to feature vectors, to reduce the computational complexity occurring when data is mined.

2.1 Drawbacks

They did not mention any accuracy

It can't thereby better determine the regularity of rainfall data and achieve more accurate prediction results of flash floods.

3. INTRODUCTION

Domain overview

3.1 Data Science

Data science is an interdisciplinary field that uses scientific methods, processes, algorithms and systems to extract knowledge and insights from structured and unstructured data, and apply knowledge and actionable insights from data across a broad range of application domains.

The term "data science" has been traced back to 1974, when Peter Naur proposed it as an alternative name for computer science. In 1996, the International Federation of Classification Societies became the first conference to specifically feature data science as a topic. However, the definition was still in flux.

The term “data science” was first coined in 2008 by D.J. Patil, and Jeff Hammerbacher, the pioneer leads of data and analytics efforts at LinkedIn and Facebook. In less than a decade, it has become one of the hottest and most trending professions in the market.

Data science is the field of study that combines domain expertise, programming skills, and knowledge of mathematics and statistics to extract meaningful insights from data.

Data science can be defined as a blend of mathematics, business acumen, tools, algorithms and machine learning techniques, all of which help us in finding out the hidden insights or patterns from raw data which can be of major use in the formation of big business decisions.

Data Scientist:

Data scientists examine which questions need answering and where to find the related data. They have business acumen and analytical skills as well as the ability to mine, clean, and present data. Businesses use data scientists to source, manage, and analyze large amounts of unstructured data.

Required Skills for a Data Scientist:

- **Programming**: Python, SQL, Scala, Java, R, MATLAB.
- **Machine Learning**: Natural Language Processing, Classification, Clustering.
- **Data Visualization**: Tableau, SAS, D3.js, Python, Java, R libraries.
- **Big data platforms**: MongoDB, Oracle, Microsoft Azure, Cloudera.

3.2 ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to the natural intelligence displayed by humans or animals. Leading AI textbooks define the field as the study of "intelligent agents" -- any system that perceives its environment and takes actions that maximize its chance of achieving its goals. Some popular accounts use the term "artificial intelligence" to describe machines that mimic "cognitive" functions that humans associate with the human mind, such as "learning" and "problem solving", however this definition is rejected by major AI researchers.

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.

AI applications include advanced web search engines, recommendation systems (used by YouTube, Amazon and Netflix), Understanding human speech (such as Siri or Alexa), self-driving cars (e.g., Tesla), and competing at the highest level in strategic game systems (such as chess and go), As machines become increasingly capable, tasks considered to require "intelligence" are often removed from the definition of AI, a phenomenon known as the AI effect. For instance, optical character recognition is frequently excluded from things considered to be AI, having become a routine technology.

Artificial intelligence was founded as an academic discipline in 1956, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter"), followed by new approaches, success and renewed funding. AI research has tried and discarded many different approaches during its lifetime, including simulating the brain, modeling human problem solving, formal logic, large databases of knowledge and imitating animal behavior. In the first decades of the 21st century, highly mathematical statistical machine learning has dominated the field, and this technique has proved highly successful, helping to solve many challenging problems throughout industry and academia.

The various subfields of AI research are centered around particular goals and the use of particular tools. The traditional goals of AI research include reasoning, knowledge representation, planning, learning, natural language processing, perception and the ability to move and manipulate objects. General intelligence (the ability to solve an arbitrary problem) is among the field's long-term goals. To solve these problems, AI researchers use versions of search and mathematical optimization, formal logic, artificial neural networks, and methods based on statistics, probability and economics. AI also draws upon computer science, psychology, linguistics, philosophy, and many other fields.

The field was founded on the assumption that human intelligence "can be so precisely described that a machine can be made to simulate it". This raises philosophical arguments about the mind and the ethics of creating artificial beings endowed with human-like intelligence. These issues have been explored by myth, fiction and philosophy since antiquity. Science fiction and futurology have also suggested that, with its enormous potential and power, AI may become an existential risk to humanity.

As the hype around AI has accelerated, vendors have been scrambling to promote how their products and services use AI. Often what they refer to as AI is simply one component of AI, such as machine learning. AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms. No one programming language is synonymous with AI, but a few, including Python, R and Java, are popular.

In general, AI systems work by ingesting large amounts of labeled training data, analyzing the data for correlations and patterns, and using these patterns to make predictions about future states. In this way, a chatbot that is fed examples of text chats can learn to produce life-like exchanges with people, or an image recognition tool can learn to identify and describe objects in images by reviewing millions of examples.

AI programming focuses on three cognitive skills: learning, reasoning and self-correction.

Learning processes. This aspect of AI programming focuses on acquiring data and creating rules for how to turn the data into actionable information. The rules, which are called algorithms, provide computing devices with step-by-step instructions for how to complete a specific task.

Reasoning processes. This aspect of AI programming focuses on choosing the right algorithm to reach a desired outcome.

Self-correction processes. This aspect of AI programming is designed to continually fine-tune algorithms and ensure they provide the most accurate results possible.

AI is important because it can give enterprises insights into their operations that they may not have been aware of previously and because, in some cases, AI can perform tasks better than humans. Particularly when it comes to repetitive, detail-oriented tasks like analyzing large numbers of legal documents to ensure relevant fields are filled in properly, AI tools often complete jobs quickly and with relatively few errors.