SRUJANI

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C. V. Raman Polytechnic

A constituent organization of C.V. Raman Global University

C. V. Raman Polytechnic

Vision	Mission
To emerge as a global leader in the area of higher education through the pursuit of excellence with future of skills and innovation to match the ever changing global scenario.	• Inculcating best engineering skills, professional ethics and practices. • Working collaboratively with technical Institutes / Universities/ Industries of National and International repute. • Providing strong foundations by adopting effective teaching learning methods. • Developing leadership qualities, effective soft skills, critical thinking and attitude of lifelong learning by organizing student centric activities.

Department of Computer Science and Engineering

Vision	Mission
To become a leader to providing quality education with the state-of-art technologies to address Industrial and societal problems.	• To build human resource with sound theoretical and practical knowledge in the discipline of Computer Science & Engineering. • To work in teams for Research, Projects, and Co-Curricular activities involving modern approaches, tools and technology. • To interact and collaborate with professionals from industry, academia, professional societies, community groups for improvements of quality of education.

Program Educational Objectives (PEO)	
PEO1	Apply the principles of Computer Engineering to identify and solve real world problems.
PEO2	Excel in professional career, exhibit leadership qualities with ethics and soft skills.
PEO3	Pursue higher education, research or entrepreneurship.
PEO4	Develop a positive attitude towards lifelong learning and succeed in industry or higher education.

Program Outcomes (PO)	
PO1	Basic and discipline specific knowledge
PO2	Problem analysis
PO3	Design/development of solutions
PO4	Engineering tools, experimentation and testing
PO5	Engineering Practices for society, sustainability and environment
PO6	Project Management
PO7	Lifelong Learning

Program specific outcomes (PSO)	
PSO1	The ability to understand, analyze and develop computer programs in the area of computer science and to solve computer software and hardware related engineering problems.
PSO2	The ability to develop software systems to allow convenient use of computing system and possess professional skills and knowledge of software design process.

Editorial Board

Content

IP Address Spoofing

In computer networking, the term IP Address spoofing ot IP Spoofing refers to the creation of internet protocol(IP) packets with a forged cource IP address, called spoofing, with the purpose of concealing the identity of the sender or impersonality another computing system. The term spoofing is also sometimes used to refer to *header forgery,* the insertion of false or misleading information in e-mail or netnews headers, Falsified headers are used to mislead the recipient, or network applications, as to the origin of a message. This common technique of spammers and spoggers, who wish to conceal the origin of their messages to avoid being tracked down. The basic protocol for sending data over the internet network and many other computer networks is the Internet Protocol(IP). The header of each IP packets contains, among other things, the numerical source and address packet. The source address is normallyteh address, an attacker can make it appear that the packet was sent by differnt machine. The machine that recieves spoofed packets will send a response back to the forged source address, which means that this technique is mainly used when the attacker does not care about the response or the attacker has some way of guessing the response. In certain cases, it might be possible for the attacker to see or redirect the response to his own machine. The most usual case is whan the attacker is spoofing an address on the same LAN or WAN.

APPLICATION:

IP spoofing is most frequently used in denial-of service attacks. In such attacks the goal is to flood the victim with overwhelming amounts of traffic, and the attacker does not care about recieving responses to the attack packets. Packets with spoofed addresses are thus suitable for such attacks. They have additional advantages for this purposes- they are more difficult to filter since each spoofed packets appears to come from different address, and they hide the true source of attack. Denial of service attack that use spoofing typically randomly choose addresses from the entire IP address space, though more sophisticated spoofing mechnism might avoid unroutable addresses or unused portion of the IP address space. The proliferation of large botnets makes spoofing less important in denial of service attacks, but attackers typically have spoofing available as a tool, if they want to use it, so defenses against denial-of-service attacks that rely on the validity fo the source IP address in attack packets might have trouble with spoofed packets. Backscatter, a technique used to observe denial-of-ser-vice attack in the internet, relies on attackers' use of IP spoofing for its effectiveness. IP spoofing can also be a method of attac used by network intruders to defeat network security measures, such as authentication based on IP address. This method of attack on a remote system can be extremely difficult, as it involves modifying thousands of packets at a time. This type of attack is most effective where trust relationship exist between machines. For example, it is common on some corporate networks to have internal systems trust each othe, so that users can log in without a username or password provided they are connecting from another machine on the internal network (and so must already be logged in). By spoofing a connection from a trusted machine, an attacker may be able to access the target machine without an authentication.

Services vulnerable to IP spoofing:

Configuration and services that are vulnerable to IP spoofing

-RPC(Remote Procedure Call Services)

- Any Service that uses IP address authentication
- The X windoe System
- The R services suite(rlogin, rsh, etc.)

Defense against spoofing attacks :

Packet filtering is one defense against IP spoofing attacks. The gateway to a network ususlly performs ingress filtering, which is blocking of packets from outside the network with a source address inside the network. This prevents an outside attacker spoofing the address of an internal machine. Ideally the gateway would also perform egress filtering on outgoing packets, which is blocking of packets from inside the network with a source address that is not inside. This prevents an attacker within the network performing filtering form launching IP spoofing attacks against external machines. It is also recomended to design network protocols and services so that they do not rely on the IP source address for authentication. Some upper layer protocols provide their own defense against IP spoofing attacks for example, Transmission Control Protocol(TCP) uses sequence numbers negotiated with the remote machine to ensure that arriving packets are part of an established connection. Since the attacker normally can't see any reply packets, the sequence number must be guessed in order to hijack the connection. The poor implimentation in many older operating systems and network devices however means TCP sequence numbers can be predicted.

Abhilipsa Mohanty
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Kissa Goutami

Long ago, in the times of Budha, a lady named Kisa Gautami lost her only child. The birth of this child brought harmony to her family. But now since she lost her child, the future seemed dark before her. In her innocence she thought there must be some remedy for her dead son. So, she carried the deadbody of her son in her arms, wamdering from door to door saying, “Will someone cure my boy?” Seeing this, someone said to her “Go to the Buddha, the Enlightened one; He may cure your son.” She went to Buddha and requested for the remedy for her dead son. Buddha said,” Please go from door to door and ask a few mustard seeds, but be ware! Bring mustard seeds only form that house where no one had died before.” Thus Kisa Gautami went form door to door and found there was no family on the earth who had not lost dear ones. Thedead were many but the ones living on were few. She understood the indirect teachings of the Buddha. She performed the funeral rites for her son and approached Buddha saying, “O Lord, I have no need to receive my dead son.” Develop Love for the Eternal Truth, God. All else is subject to death. So not be attached to mortals.

Murala Omkar
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Semantic Search Engine

The World Wide Web has grown to an unprecedented scale and is still growing at a significantpace. The resulting wealth of information hinders people from locating relevant information quickly on one hand, while prompts the developments of information search and retrieval technologies on the other hand. Powerful search engines built up on conventional search technologies have facilated finding useful information easily and quickly on the web. Nevertheless, the shortcomings of these conventional techniques have been recognized and discussed in large amount of literature, for example, it is often the case that people need to query search engines several times and combine the results to extract final answers.

The Semantic Searc Engine is being developed based on the current Web with a refreshed framework in which information resources are described using logic based knowledge representation laguages. It aims to enable computers to autometically process information and to promote reusability and interoperability across heterogeneous systems. Before getting into the details of how the Semantic Web contribute to search, we need to distinguish between two very different kinds of searches.

*** Navigational Searches:** In this class of searches, the user provides the search engine with a phrase or combination of words which s/he expects to find in the documents. There is no straightforward, reasonable interpretation of these words as denoting a concept. In such cases, the user is using the search engine as a navigation tool to navigate to a particular intended document. We are not interested in this class of searches.

*** Research Searches:** In most of the cases, the user provides the search engine with a phrase which is intended to denote an object about which the user is trying to gather/research information. There is no particular document which the user knows about that s/he is trying to get to. Rather, the user is trying to locate a number of documents which together will give him/her the information s/he is trying to find. This is the class of searches we are interested in. Semantic Search tries to understand the need of user, i.e.

what a user is searching for, and for this purpose, word sense disambiguation must occur. When a term is ambiguous, meaning it can have several meanings (for example, if one considers the lemma “bark”, which can be understand as “the sound of a dog”, “the skin of a tree” or “a tree-misted sailing ship”), the disambigu-ation process is started, thanks to which the most probable meaning is chosen from all those possible. Now it is the responsibility of the machine to understand the query, and provide the categorized results.

THE ALGORITHM:

The main phases of our algorithm are stated under in the form of pseudo-code:

/**Phase 1: Preprocessing*/
for each document
{
do text filtering;
apply stemming;
mark stop words;
}
/**Phase 2: Feature extraction*/
discover frequent terms;
/**Phase 3: Result Analysis*/
use LSI to discover abstract concepts:
for each abstract concept
{
find best-matching terms;
}
Display the result contents;

WHAT’S NEW ?

***Vector Space Model (VSM):**

In the Vector Space Model (VSM), every document in the collection is represented by a multidimensional vector. Each component of the vector reflects a particular key wards or term connected with the given document. The value of each component depends on the degree of relationship between its associated term and respective document.

***Latent Semantic Search (LSI):**

Latent Simantic Indexing (LSI) is a novel information Retieval techniqui that uses statistically derived conceptual indices instead of individual words for retrieval. LSI assumes that there is some underlying or latent structure in words usage that is partially abscured by variability in word choice.

***Singular Value Decomposition (SVD)**

Singular Value Decomposition (SVD) is the fundamental mathematical construct unerlying the LSI. It is used to estimate the strusture in word usage across the documents. The decompsition breaks a *t* .... *d*matrix *A* into three matrices *U*, ... and *V* such that *A*= *U*...*VT*. In the figure given below, the relative sizes of the three matrices are shown when $t>d$ and when $t<d$.

CHALLENGES:

***Vastness:** The World Wide Web contains many billions of pages. Any automated resoning system will have to deal with truly huge inputs.
***Vegueness:** This srises from the vegueness of user queries, of concepts represented by content providers, of matching query terms to provider terms and of trying to combine different knowledge bases with overlapping but subtly different concepts.
***Uncertainty:** These are precise concepts with uncertain values.
***Inconsistency:** These are logical contradictions which will inevitably arise during the develop ment of large ontologies, and when ontologies from separate sources are combined.
***Deceit:** This is when the producer of the information is intentionally misleading the consumer of the information.

CONCLUSION:

The concept of Semantic search engines is being used to multimedia data and the concept is being used for other data analysis, data retrieval and data mining areas.

Shobhit Gupta

Smiling Silence . . .

We rarely value silence. The more noise & commotion we make, the greater we make our presence felt. Similarly the louder we be in our personal life, social life or professional life the more we attract attention. But, friends, silence has a serenity & its value it should not be underestimeted. Mother Nature is always silent. The stars & moon silently spread out it's beauty in the dark night sky & provides us the warmth. A flower blosooms silently & spread it's fragrance when we take the last breath of our life, we are silent. If we turn the pages of the history, we will see that silence is valued. We do meditation & offer Prayer to God in silent. So it is said rightly that, "lets be silent so tha we can hear the whispers of Gods" Sometimes when we are depressed or angry we prefer to remain silent, than uttering something & hurting the person in front of us & creating a wrong remark. Everyone should remain silent for sometime so that one would get the time to introuspect one self. Very often when we are teased or depressed we say "leave us alone". We prefer to remain silent & analyze the situation. Almost all of us have someone in our 'life' who can "read our silence". Silence can be interpreted in thousnads of ways. Very often our reply to many of the question is in a "smiling Silence" way. It means Either we have a lot to say but not getting to express or we do it have anything to express about. The feelings that silence can express where words can't. Provided we have a right person to understand it.

Aliva Priyadarshini Sahoo
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Transforming Mistakes Into Blessings

Every single mistake is a blessing in disguise.....these are actually untold blessings hidden within every mistake. Children make many mistake while learning and don’t give it a second thought because they know that they will learn from their mistakes and will eventually and master what they are trying to do.We all make mistakes and if we didn’t make them we’d never learn anything and we wouldn’t grow any smaster or wises. We have the freedom to make our own choice and also the freedom to make the mistake.
Mistakes can hurt, but if we don’t learn from them, the pain we’ve suffered goes in vain and is of no use. By the law of attraction, we will make the same mistake over and over again, until the consequences hurt so much that we finally learn from it. The problem with blaming other people for our mistake is that we will still suffer the pain and consequences of our mistake, he won’t learn from it and we’ll keep making the same mistake again. No matter how had something may seem these are always many things to the grateful for. When you look for as many things as you can to he grateful, you magically transfer them into blessings. Mistakes attract more mistakes and blessings attract more blessings. - Which would you psetes ? Once you’ve chosen a mistake to magically transfer into blessings, look for the things to the grateful for. Ask your self : what did it learn ? Every blessing you find has magical power.

Arpita Jena
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Building Self Confidence

Devine to achieve something is substantial. Though it is a ...... of the material body to satisfy abstract mind, it is not deadly necessary for survival. It is a signal of an immature action or maiden ambition when you are somewhat hungry, you simply eat and the desire is satisfied. If you feel deathly hungry because you forgot to take both break fast and lunch and now it is 9pm, it is because you have been showing your negligence, what in other words is called ignorance to your body's need. Have you ever cultivated an intense buring device for something ? I say "burning device" interest .... with intense self confidence and determination to achieve something. Sometimes, it so happens that we conceive self-ego as self-confidence, but it is obvious that there is not enough self confidence in the world. Many of us lack self confidence. Self confidence actually comes within one's self. If you are confident person, you can take on everything but be careful, there is actually a boundary that you don't want to cross and that is over confidence. In some cases, it so happens that lack of self confidence leads to dissatisfaction revulted in frustruction. Though it is not real, yet is controls one's destination. So, if you choose frustraction as a way of life, you undermine your personality and make your image shrink. In other words 'you'and 'you alone can add to your assests or accumulate more liabilities. No one can do it for you. In order to be better 'you' the big 'you' with better personality ought to do one thing at one time. Shoot for one goal at one time, live in the present; live today, forget the mistakes of yesterday, but remember the only lesson it taught. Stop criticizing yourself as well as others. Learn for self improvement, hold on to your self respect by approching yourself honestly. Learn to listen to others for it helps rictifying yourself, building your self confidence. It is a gold setting task. You may have one big thing that you want to achieve, but write down little achievable goals that you can accomplish on the way. Be positive in every walk of life for, positiveness is the only source of building one's self confidence.

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The Quantum Leap: Exploring the Future of Computing

In the ever-evolving landscape of computer science, one of the most intriguing and revolutionary frontiers is quantum computing. Traditional computers, built on classical bits, have powered our digital world for decades. However, the limits of classical computing are becoming increasingly apparent as we tackle complex problems like simulating quantum systems, optimizing large-scale logistics, and cracking advanced encryption.

Enter quantum computing, a paradigm-shifting technology that leverages the principles of quantum mechanics to perform computations at speeds and scales previously deemed impossible. In this article, we will delve into the fundamentals of quantum computing, its potential applications, and the current state of research in this exciting field.

Understanding Quantum Computing:

Unlike classical computers that use bits to represent information as either 0 or 1, quantum computers use quantum bits, or qubits. What sets qubits apart is their ability to exist in multiple states simultaneously, thanks to a phenomenon called superposition. This allows quantum computers to process vast amounts of information in parallel, leading to an exponential increase in computational power.

Another key principle is entanglement, where qubits become interconnected in such a way that the state of one qubit directly influences the state of another, regardless of the distance between them. This interconnectedness enables quantum computers to solve certain problems more efficiently than their classical counterparts.

Applications of Quantum Computing:

1. **Optimization Problems:** Quantum computers excel at solving optimization problems, such as route planning, resource allocation, and logistical optimization. Industries like transportation, finance, and supply chain management stand to benefit significantly from these capabilities.
2. **Drug Discovery and Material Science:** Quantum computers can simulate molecular and atomic interactions with unparalleled precision. This opens new avenues for drug discovery, material design, and understanding complex chemical processes, potentially accelerating advancements in pharmaceuticals and materials science.
3. **Cryptography:** While quantum computers pose a threat to traditional encryption methods, they also offer solutions through the development of quantum-resistant cryptographic algorithms. Research in quantum-safe cryptography aims to ensure the security of communication systems in the post-quantum era.

4. **Machine Learning and Artificial Intelligence:** Quantum computing has the potential to enhance machine learning algorithms and speed up the training of complex models. Quantum machine learning could lead to breakthroughs in pattern recognition, optimization, and data analysis.

Challenges and Current Research:

Despite the promise of quantum computing, there are significant challenges to overcome. Quantum systems are highly sensitive to their environment, making them prone to errors. Researchers are actively working on error correction techniques and developing fault-tolerant quantum computers.

Several companies and research institutions are making strides in quantum hardware development, with notable progress in building more stable qubits and increasing coherence times. Moreover, cloud-based quantum computing services are becoming available, allowing researchers and businesses to access quantum processing power remotely.

Conclusion:

The advent of quantum computing marks a transformative era in computer science. As we unlock the potential of quantum systems, we are poised to address some of the most complex challenges facing our world today. The fusion of classical and quantum computing may lead to hybrid systems, offering the best of both worlds.

While the field is still in its infancy, the rapid pace of innovation and collaboration among researchers worldwide bode well for the future of quantum computing. As we navigate this uncharted territory, the possibilities are boundless, and the quantum leap in computing capabilities promises a new era of scientific discovery and technological advancement.

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The Rise of Explainable Artificial Intelligence: Bridging the Gap Between Man and Machine

In the age of Artificial Intelligence (AI), machines are becoming increasingly proficient at making complex decisions, analyzing vast datasets, and performing tasks once thought to be exclusive to human intelligence. However, as AI systems become more prevalent in our daily lives, there is a growing need for transparency and interpretability. Enter Explainable Artificial Intelligence (XAI), a field that seeks to demystify the decision-making processes of AI systems, fostering trust and understanding between humans and machines.

The Need for Explainability:

While AI has made significant strides in various domains, the "black box" nature of many machine learning algorithms poses challenges, especially in critical applications such as healthcare, finance, and criminal justice. Users often struggle to comprehend how AI arrives at a specific decision, raising concerns about bias, fairness, and ethical implications.

Explainability becomes crucial not only for regulatory compliance but also for building confidence in AI systems. As we entrust AI with increasingly important decisions, the ability to understand and trust these decisions becomes paramount.

Approaches to Explainable AI:

1. **Interpretable Models:** One approach to XAI involves using inherently interpretable models, such as decision trees or linear regression, which provide clear and straightforward rules for decision-making. While these models are easier to understand, they may not capture the complexity of certain tasks as effectively as more sophisticated algorithms.
2. **Post-hoc Interpretability:** Another strategy involves adding a layer of interpretability to existing complex models. Techniques like LIME (Local Interpretable Model-agnostic Explanations) generate simplified, local explanations for specific predictions, making it easier for users to understand the model's reasoning without compromising its overall performance.
3. **Rule-Based Systems:** Rule-based systems explicitly define decision rules that are understandable to humans. These systems provide a transparent framework for decision-making and are particularly useful in domains where regulatory compliance and accountability are critical.
4. **Visualizations and Dashboards:** Presenting complex AI outputs through visualizations and interactive dashboards can enhance human understanding. Visualization tools allow users to explore and interrogate AI-generated insights, fostering a collaborative relationship between humans and machines.

Real-world Applications:

1. **Healthcare:** In medical diagnosis and treatment recommendations, XAI can help healthcare professionals understand why a particular diagnosis or treatment plan was suggested. This not only enhances trust but also facilitates collaboration between AI systems and medical experts.
2. **Finance:** In the financial sector, explainability is crucial for regulatory compliance and risk management. Transparent AI systems can provide clear justifications for credit scoring, investment recommendations, and fraud detection, allowing stakeholders to make informed decisions.
3. **Criminal Justice:** In criminal justice applications, XAI can shed light on the factors influencing decisions related to parole, sentencing, and risk assessment. This transparency is essential for ensuring fairness and avoiding unjust biases in the legal system.

Conclusion:

Explainable Artificial Intelligence represents a pivotal step towards creating responsible and trustworthy AI systems. As these technologies continue to permeate our daily lives, the need for understanding and transparency becomes even more pronounced. The collaborative efforts of researchers, industry professionals, and policymakers in advancing XAI will not only improve the interpretability of AI systems but also contribute to the responsible development and deployment of artificial intelligence in society. In bridging the gap between man and machine, we pave the way for a future where AI augments human capabilities while maintaining accountability and ethical standards.

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