Computer World!

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● CELL PHONES

Millions of people are using cell phones today.

In many places it is actually considered unusual not to use one.

In many countries, cell phones are very popular with young people.

They find that the phones are more than a means of communication-having a mobile phone show that they are cool and connected.

The explosion around the world in mobile phone use has some health professionals worried.

Some doctors are concerned that in the future many people may suffer health problems from the use of mobile phones.

In England, there has been a serious debate about this issue.

Mobile phone companies are worried about the negative publicity of such ideas.

They say that there is no proof that mobile phones are bad for your health.

On the other hand, why do some medical studies show changes in the brain cells of some people who use mobile phones?

Signs of change in the tissues of the brain and head can be detected with modern scanning equipment.

In one case, a traveling salesman had to retire at a young age because of serious memory loss.

He couldn't remember even simple tasks.

He would often forget the name of his own son.

This man used to talk on his mobile phone for about six hours a day, every day of his working week, for a couple of years.

His family doctor blamed his mobile phone use, but his employer's doctor didn't agree
What is it that makes mobile phones potentially harmful?

The answer is radiation.

High-tech machines can detect very small amounts of radiation from mobile phones.

Mobile phone companies agree that there is some radiation, but they say the amount is too small to worry about.

As the discussion about their safety continues, it appears that it's best to use mobile phones less often.

Use your regular phone if you want to talk for a long time.

Use your mobile phone only when you really need it. Mobile phones can be very useful and convenient, especially in emergencies.

In the future mobile phones may have a warning label that says they are bad for your health.

So, for now, it's wise not to use your mobile phone too often.

● INCLUDES OF CLOUD SERICES

The advantages of cloud computing, such as easy access to computer resources, the existence of various payment models, and a scalable environment, have led to significant growth in recent years.

Leveraging the cloud is a good model for running programs with high reliability and low cost compared to other platforms.

Cloud services are often segmented into three different types of offerings; Infrastructure as a Service (IaaS), Software as a Service (SaaS), and Platform as a Service (PaaS).

Infrastructure as a Service (IaaS) is a unique service model at the bottom base layer of the cloud computing stack, near the hardware.

IaaS provides users with virtual machine-based infrastructure resources, allowing them to elastically lease VMs with various capacities and functionalities.

Virtual machines are typically supplied in a variety of leasing periods and pricing structures, depending on the demands of consumers and different conditions.

Cloud providers offer fixed-rate virtual machines, such as on-demand instances, under the fixed pricing model.

Users pay a fixed amount based on the type of region and availability zones in the on-demand instance, which varies based on the number of CPU cores, clock rates, memory size, and other factors.

The fixed-price VMs offer an important level of stability and availability, although they are more expensive than other models.

Furthermore, on-demand servers are irrevocable until the user's needs are met.

Cloud providers offer dynamic and changeable pricing for virtual machines, including Spot Instances in a variable-price paradigm.

Using additional computing capacity provides many discounts that are very beneficial to users, especially those with large workloads, although they do not ensure availability or stability and are revocable.

As a result, spot instances are frequently used in applications that are fault-tolerant and time- insensitive.

Spot instances allow users to provide the maximum offer they are willing to pay.

If the offer is higher than the spot price, the request will be accepted.

Otherwise, the user will wait.

Amazon updates the Spot price regularly based on demand (user's bid) and supply (resource availability).

The instance runs until the client terminates it, or the Spot price changes to a value higher than the user's suggested price.

If the cloud platform pulls a Spot server for any reason at any time, the interrupted Spot may be terminated or hibernated according to recent Amazon updates.

When the VM is no longer needed, if the Spot price is higher than the user's maximum bid, the saved memory and context are reloaded.

Today, large companies such as Yelp, NASA JPL, FINRA, Netflix, and Autodesk are benefiting from using Sis for various applications such as modeling and time analysis, video and image processing, data processing computation, and big data.

Accurately predicting the spot price increases the reliability of using these instances and also helps users find the optimal time and price for the proposal.

Recently, artificial neural networks (ANNs) have made great strides in predicting time series due to their universal approximation, being data-driven, and ability to model nonlinear patterns in data.

Recurrent neural networks (RNNs) are a special class of ANNs used in predicting variable workloads problems due to their superior sequential processing ability.

RNNs often suffer from vanishing problems and lack the ability to learn long-term memory dependencies well.

With the advent of long short-term memory (LSTM), gated recurrent unit (GRU), and Transformer models, many problems of RNNs have been solved due to the large capacity of information management.

However, these methods also have limitations in predicting time series.

ANNs with deep architecture has been found to perform far better in accurate modeling of high-order nonlinear time series than ANNs with non-deep architecture, even though different ANN architectures can offer good linear patterns for time series data.

However, the substantial number of parameters and the complexity of the deep neural network topology increase the probability of overfitting occurrence.

Therefore, regularization methods such as dropout should be used to avoid reducing the impact of fit on test data.

In the highly dynamic market of cloud computing, it is important to provide research for spot pricing proposals.

By accurately predicting spot prices, users will effectively solve the problems of bid setting and instance selection.

Thus, it will help users save a considerable amount of money, and improve reliability obviously.

In addition, users can know the price trend of spot instance in the future by predicting the price in advance.

In this study, a new prediction method named MGRU is proposed which predicts future prices accurately and quickly, minimizing prediction error.

Moreover, using the proposed dropout in this method leads to the effective use of training data to reduce overfitting.

After making the necessary modifications to increase the accuracy and flexibility of the structure, the authors determine the hyper parameters of the model, perform experiments and compare the results based on the criteria used in the work.

We apply the proposed method to real Amazon EC2 Spot data and compare it with other advanced time series forecasting techniques.

The results demonstrate that the proposed method outperforms other existing methods.

The rest of this paper is organized as follows.

A literature review in Section 2 provides a brief overview of the study.

Section 3 gives a brief introduction related to temporal models.

Section 4 presents the architecture of the proposed method.

A description of the setup is provided in section 5 to evaluate the techniques provided.

Section 6 presents and analyzes the performance evaluation results and Section 7 presents and analyzes the conclusions.

● COMPUTER'S CHARACTERISTICS

Computers are machines designed to process, electronically, specially prepared pieces of information which are termed data.

Handling or manipulating the information that has been given to the computer, in such ways as doing calculations, adding information or making comparisons is called processing.

Computers are made up of millions of electronic devices capable of storing data or moving them, at enormous speeds, through complex circuits with different functions.

All computers have several characteristics in common, regardless of make or design.

Information, in the form of instructions and data, is given to the machine, after which the machine acts on it and a result is then returned.

The information to the machine is the input; the internal manipulative operations, the processing; and the result, the output.

These three basic concepts of input, processing and output occur in almost every aspect of human life whether at work or at play.

For example, in clothing manufacturing, the input is the pieces of cut cloth; the processing is the sewing together of these pieces and the output is the finished garment.

INPUT >>> COPMUTER >>> OUTPUT
↓↑
SECOND STORAGE

Figure in the previous page shows schematically the fundamental hardware components in a computer system.

The centerpiece is called either the computer, the processor, or, usually, the Central Processing Unit (CPU).

The term 'computer' includes those parts of hardware in which calculations and other data manipulations are performed and the high-speed internal memory in which data and calculations are stored during actual execution of programs.

Attached to the CPU are the various peripheral devices such as keyboards and mice (two common examples of input devices).
When data or programs need to be saved for long periods of time, they are stored on various secondary memory devices or storage devices such as magnetic tapes or magnetic disks.

Computers have often been thought of as extremely large adding machines, but this is a very narrow view of their function.

Although a computer can only respond to a certain number of instructions, it is not a single-purpose machine since these instructions can be combined in an infinite number of sequences.

Therefore, a computer has no known limit on the kinds of things it can do; its versatility is limited only by the imagination of those using it.

In the late 1950s and early 1960s when electronic computers of the kind in use today were being developed, they were very expensive to own and run.

Moreover, their size and reliability were such that a large number of support personnel were needed to keep the equipment operating.

This has all changed now that computing power has become portable, more compact and cheaper.

In only a very short period of time, computers have greatly changed the way in which many kinds of work are performed.

Computers can remove many of the routine and boring tasks from our lives, thereby leaving us with more time for interesting, creative work.

It goes without saying that computers have created whole new areas of work that did not exist before their development.

● APPLICATION SERVICE PROVIDERS

If your hard disk is packed to bursting point, the IT department is far too busy to fix your email problems and your business can't afford to buy the tools that you'd like to develop the company website, then it’s time to think about using an application service provider (ASP).

Rather than installing software on each machine or server within your organization, you rent applications from the ASP, which provides remote access to the software and manages the hardware required to run the applications.

There are a lot of advantages to this approach.

The havoc caused by viruses makes the idea of outsourcing your email and office suite services an attractive option.

It also gives you more flexibility - you pay for applications as and when you need them, rather than investing in a lot of costly software which you're then tied to for years.

Not having to worry about upgrading to the latest version of your office suite or about battling with the complexities of managing an email system, leaves businesses with mere time.

Time to focus on what they do best.

However, there are some potential pitfalls.

To use applications remotely requires a lot of bandwidth, which is only really available from a broadband connection or a leased line to the ASP itself.

It is also important to ensure that the ASP will be able to provide a secure, reliable service which will be available whenever you need it.

Providing applications and storage space for vast numbers of users requires some powerful technology on the port of the ASP, this includes security controls and data storage as well as providing the physical links to customers.

For the most part, ASPs don't own the data centers that store the information.

Instead, they lease space from data storage specialists.

In this way, they can be confident of meeting customers' increasing storage requirements by buying more space as it's needed.

There's a wide variety of applications available for use via ASPs.

Office suite applications and email services are two of the most generic applications available through ASPs.

Large, complex business applications such as enterprise resource planning tools like ASP are another popular candidate for delivery through an ASP.

Other business services, such as payroll and accounting systems are also available.
This is particularly beneficial to small businesses which are likely to grow quickly and don't want to deal with the problems caused by outgrowing their existing system and having to move to a high-end package.

ASPs also offer a means of using specialist tools that would otherwise prove prohibitively expensive.

Small businesses have the opportunity to use such tools for short periods of time as and when they need them, rather than having to buy the software as a permanent investment.

One of the major barriers for small businesses which want to make a start in e-commerce is ensuring that they have sufficient resources to cope with sudden large increases in customers.

This means not only having adequate storage for all your customers' details, but ensuring that you have the technology in place to handle stock levels, efficient delivery and large volumes of traffic.

It's very rare for an e-commerce business to handle all of these elements by itself, making this one of the best-established areas of ASP use.

Being able to respond rapidly to changes in the size of your customer base and the type of product that they want to order from your business, demands more flexibility than traditional software can provide.

● COMPUTERS MAKE THE WORLD SMALLER AND SMARTER

The ability of tiny computing devices to control complex operations has transformed the way many tasks are performed, ranging from scientific research to producing consumer products.

Tiny 'computers on a chip' are used in medical equipment, home appliances, cars and toys.

Workers use handheld computing devices to collect data at a customer site, to generate forms, to control inventory and to serve as desktop organizers.

Not only is computing equipment getting smaller, it is getting more sophisticated.

Computers are part of many machines and devices that once required continual human supervision and control.

Today, computers in security systems result in safer environments, computers in cars improve energy efficiency and computers in phones provide features such as call forwarding, call monitoring and call answering.

These smart machines are designed to take over some of the basic tasks previously performed by people; by so doing, they make life a little easier and a little more pleasant.

Smart cards store vital information such as health records, drivers' licenses, bank balances and so on.

Smart phones, cars and appliances with built in computers can be programmed to better meet individual needs.

A smart house has a built-in monitoring system that can turn lights on and off, open and close windows, operate the oven and more.

With small computing devices available for performing smart tasks like cooking dinner, programming the VCR and controlling the flow of information in an organization, people are able to spend more time doing what they often do best-being creative.

Computers can help people work more creatively.

Multimedia systems are known for their educational and entertainment value, which we call 'edutainment'.

Multimedia combines text with sound, video, animation and graphics, which greatly enhances the interaction between user and machine and can make information more interesting and appealing to people.

Expert systems software enables computers to 'think' like experts.

Medical diagnosis expert systems, for example, can help doctors pinpoint a patient's illness, suggest further tests and prescribe appropriate drugs.

Connectivity enables computers and software that might otherwise be incompatible to communicate and to share resources.
Now that computers are proliferating in many areas and networks are available for people to access data and communicate with others, personal computers are becoming interpersonal PCs.

They have the potential to significantly improve the way we relate to each other.

Many people today telecommute that is, use their computers to stay in touch with the office while they are working at home.

With the proper tools, hospital staff can get a diagnosis from a medical expert hundreds or thousands of miles away.

Similarly, the disabled can communicate more effectively with others using computers.

Distance learning and videoconferencing are concepts made possible with the use of an electronic classroom or boardroom accessible to people in remote locations.

Vast databases of information are currently available to users of the Internet, all of whom can send mail messages to each other.

The information superhighway is designed to significantly expand this interactive connectivity so that people all over the world will have free access to all these resources.

People power is critical to ensuring that hardware, software and connectivity are effectively integrated in a socially responsible way.

People - computer users and computer professionals are the ones who will decide which hardware, software and networks endure and how great an impact they will have on our lives.

Ultimately people power must be exercised to ensure that computers are used not only efficiently but in a socially responsible way.

● BECOMING CERTIFIED

Suppose you're a support engineer.

You're stuck in a job you don't like and you want to make a change.

One way of making that change is to improve your marketability to potential employers by upgrading your skill-set.

If you're going to train yourself up however, whose training should you undertake?

If you need certificates, whose certificates should they be?

Even if you get those certificates, how certain can you be that your salary will rise as a result?

One solution is the range of certifications on offer from Microsoft.

Microsoft offers a large array of certification programmers aimed at anyone from the user of a single program such as Microsoft Word, to someone who wants to become a certified support engineer.

There is a myriad of certificates to study for too, if you're the proud holder of any of those qualifications, then you're entitled to call yourself a Microsoft Certified Professional (MCP).

Once you've decided which track you want to take, you should consider just how qualified you already are in terms of experience and knowledge.

Will you need to go and take some courses with a training company, or are you the type who can make good use of self-study materials?

How much time do you genuinely have to devote towards this?

Will your employer pay for your course?

Will it grant you leave to go and do the course assuming you can find one on either a full-time or part-time basis?

The key question here is experience.

This will not only influence the amount of work you'll have to do to get up to speed for the exams, it could also mean the difference between passing or failing the exam.

While you're busy learning all you need to know for your certification, the practice exams are an absolute godsend.

They show you the type of questions you'll encounter and they familiarize you with the structure of the exam.

This is essential if you want to pass: the exams have time limits and you need to get used to answering the requisite number of questions within the allotted time.

It's as simple as that.

If you decide a training course will help you out, don't let the title of a course alone convince you that it will be suitable or cost effective.

Find out exactly what the course offers and whether there are prerequisites for attendants.

You should also find out what the training company is prepared to do if attendants don't have the minimum knowledge necessary to be on the course.

As exams are replaced by 'updated' ones, you need to upgrade your certification to stay current.

Ultimately, it's your responsibility to make sure you stay up to date.

If you don't, you lose your certification until you take an update.

As a support engineer, you get the satisfaction of knowing that you passed a tough test and the happy knowledge that your network manager is sweating a bit over the fact that you could be head-hunted at any time.

● NEURAL NETWORKS

An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the nay biological nervous systems, such as the brain, process information.

The key element of this paradigm is the novel structure of the information processing system.

It is composed of a large number of highly interconnected processing elements (neurons) working in unison to solve specific problems.

ANNs, like people, learn by example.

An ANN is configured for a specific application, such as pattern recognition or data classification, through a learning process.

Learning in biological systems involves adjustments to the synaptic connections that exist between the neurons.

This is true of ANNs as well.

Neural network simulations appear to be a recent development.

However, this field was established before the advent of computers, and has survived at least one major setback and several eras.

Many important advances have been boosted by the use of inexpensive computer emulations.

Following an initial period of enthusiasm, the field survived a period of frustration and disrepute.

During this period when funding and professional support minimal, important advances were made by relatively few researchers.

These pioneers were able to develop convincing technology which surpassed the limitations identified by Minsky and Papert.

Minsky and Papert, published a book (in 1969) in which they summed up a general feeling of frustration (against neural networks) among researchers, and was thus accepted by most without further analysis.

Currently, the neural network field enjoys a resurgence of interest and a corresponding increase in funding.

The first artificial neuron was produced in 1943 by the neurophysiologist Warren McCulloch and the logician Walter Pits.

But the technology available at that time did not allow them to do too much.

Neural networks, with their remarkable ability to derive meaning from complicated or imprecise data, can be used to extract patterns and detect trends that are too complex to be noticed by either humans or other computer techniques.

A trained neural network can be thought of as an "expert" in the category of information it has been given to analyze.

This expert can then be used to provide projections given new situations of interest and answer "what if" questions.

Other advantages include:
Adaptive learning: An ability to learn how to do tasks based on the data given for training or initial experience.

Self-Organization: An ANN can create its own organization or representation of the information it receives daring learning time.

Real Time Operation: ANN computations may be carried out in parallel, and special hardware devices are being designed and manufactured which take advantage of this capability.

Fault Tolerance via Redundant Information Coding: Partial destruction of a network leads to the corresponding degradation of performance.

However, some network capabilities may be retained even with major network damage.

Neural networks take a different approach to problem solving than that of conventional computers.

Conventional computers use an algorithmic approach i.e. the computer follows a set of instructions in order to solve a problem.

Unless the specific steps that the computer needs to follow are known the computer cannot solve the problem.

That restricts the problem-solving capability of conventional computers to problems that we already understand and know how to solve.

But computers would be so much more useful if they could do things that we don't exactly know how to do.

Neural networks process information in a similar way the human brain does.

The network is composed of a large number of highly interconnected processing elements (neurons) working in parallel to solve a specific problem.

Neural networks learn by example.

They cannot be programmed to perform a specific task.

The examples must be selected carefully otherwise useful time is wasted or even worse the network might be functioning incorrectly.

The disadvantage is that because the network finds out how to solve the problem by itself, its operation can be unpredictable.

On the other hand, conventional computers use a cognitive approach to problem solving; the way the problem is too solved must be known and stated in small unambiguous instructions.

These instructions are then converted to a high-level language program and then into machine code that the computer can understand.

These machines are totally predictable; if anything goes wrong is due to a software or hardware fault.

Neural networks and conventional algorithmic computers are not in competition but complement each other.

There are tasks are more suited to an algorithmic approach like arithmetic operations and tasks that are more suited to neural networks.

Even more, a large number of tasks, require systems that use combination of the two approaches (normally a conventional computer is used to supervise a neural network) in order to perform at maximum efficiency.

Neural networks do not perform miracles.

But if used sensibly they can produce some amazing results.

Much is still unknown about how the brain trains itself to process information, so theories abound.

In the human brain, a typical neuron collects signals from others through a host of fine structures called dendrites.

The neuron sends out spikes of electrical activity through a long, thin stand known as an axon, which splits into thousands of branches.

At the end of each branch, a structure called a synapse converts the activity from the axon into electrical effects that inhibit or excite activity from the axon into electrical effects that inhibit or excite activity in the connected neurons.

When a neuron receives excitatory input that is sufficiently large compared with its inhibitory input, it sends a spike of electrical activity down its axon.

Learning occurs by changing the effectiveness of the synapses so that the influence of one neuron on another changes.

We conduct these neural networks by first trying to deduce the essential features of neurons and their interconnections.

We then typically program a computer to simulate these features.

However, because our knowledge of neurons is incomplete and our computing power is limited, our models are necessarily gross idealizations of real networks of neurons.

● SAFE DATA TRANSFER

Secure transactions across the Internet have three goals.

First, the two parties engaging in a transaction (say, an email or a business purchase) don't want a third party to be able to read their transmission.

Some form of data encryption is necessary to prevent this.

Second, the receiver of the message should be able to detect whether someone has tampered with it in transit.

This calls for a message-integrity scheme.

Finally, both parties must know that they're communicating with each other, not an impostor.

This is done with user authentication.

Today's data encryption methods rely on a technique called public-key cryptography.

Everyone using a public-key system has a public key and a private key.

Messages are encrypted and decrypted with these keys.

A message encrypted with your public key can only be decrypted by a system that knows your private key.

For the system to work, two parties engaging in a secure transaction must know each other's public keys.

Private keys, however, are closely guarded secrets known only to their owners.

When I want to send you an encrypted message, I use your public key to turn my message into gibberish.

I know that only you can turn the gibberish back into the original message, because only you know your private key.

Public-key cryptography also works in reverse – that is, only your public key can decipher your private key's encryption.

To make a message tamper-proof (providing message integrity), the sender runs each message through a message-digest function.

This function within an application produces a number called a message-authentication code (MAC).

The system works because it's almost impossible for an altered message to have the same MAC as another message.

Also, you can't take a MAC and turn it back into the original message.

The software being used for a given exchange produces a MAC for a message before it's encrypted.

Next, it encrypts the MAC with the sender's private key.
It then encrypts both the message and the encrypted MAC with the recipient's public key and sends the message.

When the recipient gets the message and decrypts it, they also get an encrypted MAC.

The software takes the message and runs it through the same message-digest function that the sender used and creates its own MAC.

Then it decrypts the sender's MAC.

If the two are the same, then the message hasn't been tampered with.

The dynamics of the Web dictate that a user authentication system must exist.

This can be done using digital certificates.

A server authenticates itself to a client by sending an unencrypted ASCII-based digital certificate.

A digital certificate contains information about the company operating the server, including the server's public key.

The digital certificate is signed by a trusted digital-certificate issuer, which means that the issuer has investigated the company operating the server and believes it to be legitimate.

If the client trusts the issuer, then it can trust the server.

The issuer 'signs' the certificate by generating a MAC for it, then encrypts the MAC with the issuer's private key.

If the client trusts the issuer, then it already knows the issuer's public key.

The dynamics and standards of secure transactions will change, but the three basic tenets of secure transactions will remain the same.

● CLOUD COMPUTING

Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user.

The term is generally used to describe data centers available to many users over the Internet.

Large clouds, predominant today, often have functions distributed over multiple locations from central servers.

If the connection to the user is relatively close, it may be designated an edge server.

Clouds may be limited to a single organization (enterprise clouds) be available to many organizations (public cloud) or a combination of both (hybrid cloud).

The largest public cloud is Amazon AWS.

Cloud computing relies on sharing of resources to achieve coherence and economies of scale.

Advocates of public and hybrid clouds note that cloud computing allows companies to avoid or minimize up-front IT infrastructure costs.

Proponents also claim that cloud computing allows enterprises to get their applications up and running faster, with improved manageability and less maintenance, and that it enables IT teams to more rapidly adjust resources to meet fluctuating and unpredictable demand.

Cloud providers typically use a "pay-as-you-go" model, which can lead to unexpected operating expenses if administrators are not familiarized with cloud-pricing models.

The availability of high-capacity networks, low-cost computers and storage devices as well as the widespread adoption of hardware virtualization, service-oriented architecture, and autonomic and utility computing has led to growth in cloud computing.

The goal of cloud computing is to allow users to take benefit from all of these technologies, without the need for deep knowledge about or expertise with each one of them.

The cloud aims to cut costs, and helps the users focus on their core business instead of being impeded by IT obstacles.

The main enabling technology for cloud computing is virtualization.

Virtualization software separates a physical computing device into one or more "virtual" devices, each of which can be easily used and managed to perform computing tasks.

With operating system-level virtualization essentially creating a scalable system of multiple independent computing devices, idle computing resources can be allocated and used more efficiently.

Virtualization provides the agility required to speed up IT operations, and reduces cost by increasing infrastructure utilization.

Autonomic computing automates the process through which the user can provision resources on-demand.

By minimizing user involvement, automation speeds up the process, reduces labor costs and reduces the possibility of human errors.

Users routinely face difficult business problems.

Cloud computing adopts concepts from Service- oriented Architecture (SOA) that can help the user break these problems into services that can be integrated to provide a solution.

Cloud computing provides all of its resources as services, and makes use of the well-established standards and best practices gained in the domain of SOA to allow global and easy access to cloud services in a standardized way.

Cloud computing also leverages concepts from utility computing to provide metrics for the services used.

Such metrics are at the core of the public cloud pay-per-use models.

In addition, measured services are an essential part of the feedback loop in autonomic computing, allowing services to scale on-demand and to perform automatic failure recovery.

Cloud computing is a kind of grid computing.