Department of Computer Applications

Research area

Human Computer Interaction

Human Computer Interaction (HCI), Educational Technology, Multimedia, and Social Computing. HCI is a large and diverse field and the faculty cover many important areas, including strengths in the fundamentals of HCI as well as exciting new technologies and services.

Cloud Cryptography

Data in the cloud is needed to be protected and secured from foreign attacks and breaches. To accomplish this, cryptography in the cloud is a widely used technique to secure data present in the cloud. It allows users and clients to easily and reliably access the shared cloud services since all the data is secured using either the encryption techniques or by using the concept of the private key. It can make the plain text unreadable and limits the view of the data being transferred. Best cloud cryptographic security techniques are the ones that do not compromise the speed of data transfer and provide security without delaying the exchange of sensitive data.

Cloud Load Balancing

It refers to splitting and distributing the incoming load to the server from various sources. It permits companies and organizations to govern and supervise workload demands or application demands by redistributing, reallocating, and administering resources between different computers, networks, or servers. Cloud load balancing encompasses holding the circulation of traffic and demands that exist over the Internet. This reduces the problem of sudden outages, results in an improvement in overall performance, has rare chances of server crashes, and also provides an advanced level of security. Cloud-based servers farms can accomplish more precise scalability and accessibility using the server load balancing mechanism. Due to this, the workload demands can be easily distributed and controlled.

Mobile Cloud Computing

It is a mixture of cloud computing, mobile computing, and wireless network to provide services such as seamless and abundant computational resources to mobile users, network operators, and cloud computing professionals. The handheld device is the console and all the processing and data storage takes place outside the physical mobile device. Some advantages of using mobile cloud computing are that there is no need for costly hardware, battery life is longer, extended data storage capacity and processing power improved synchronization of data and high availability due to “store in one place, accessible from anywhere”. The integration and security aspects are taken care of by the backend that enables support to an abundance of access methods.

Green Cloud Computing

The major challenge in the cloud is the utilization of energy-efficient and hence develop economically friendly cloud computing solutions. Data centers that include servers, cables, air conditioners, networks, etc. in large numbers consume a lot of power and release enormous quantities of Carbon Dioxide in the atmosphere. Green Cloud Computing focuses on making virtual data centers and servers to be more environmentally friendly and energy-efficient. Cloud resources often consume so much power and energy leading to a shortage of energy and affecting the global climate. Green cloud computing provides solutions to make such resources more energy efficient and to reduce operational costs. This pivots on power management, virtualization of servers and data centers, recycling vast e-waste, and environmental sustainability.

Edge Computing

It is the advancement and a much more efficient form of Cloud computing with the idea that the data is processed nearer to the source. Edge Computing states that all of the computation will be carried out at the edge of the network itself rather than on a centrally managed platform or the data warehouses. Edge computing distributes various data processing techniques and mechanisms across different positions. This makes the data deliverable to the nearest node and the processing at the edge. This also increases the security of the data since it is closer to the source and eliminates late response time and latency without affecting productivity.

Containerization

Containerization in cloud computing is a procedure to obtain operating system virtualization. The user can work with a program and its dependencies utilizing remote resource procedures. The container in cloud computing is used to construct blocks, which aid in producing operational effectiveness, version control, developer productivity, and environmental stability. The infrastructure is upgraded since it provides additional control over the granular activities over the resources. The usage of containers in online services assists storage with cloud computing data security, elasticity, and availability. Containers provide certain advantages such as a steady runtime environment, the ability to run virtually anywhere, and the low overhead compared to virtual machines.

Cloud Deployment Model

There are four main cloud deployment models namely public cloud, private cloud, hybrid cloud, and community cloud. Each deployment model is defined as per the location of the infrastructure. The public cloud allows systems and services to be easily accessible to the general public. Public cloud could also be less reliable since it is open to everyone e.g. Email. A private cloud allows systems and services to be accessible inside an organization with no access to outsiders. It offers better security due to its access restrictions. Hybrid cloud is a mixture of private and public clouds with the critical activities being performed using private cloud and non-critical activities being performed using the public cloud.

Community cloud allows system and services to be accessible by a group of an organization.

Database and data mining

The database group's research is focused on building the data management infrastructure for the twenty-first century, with particular emphasis on issues surrounding Big Data, including stream processing, approximate query answering, text mining, data integration, information extraction, and data sharing. We have a strong emphasis on database usability. Our approach is to understand at a fundamental level what it is about the data model and representation that make it hard to use and query. In addition, we have a very strong data science effort, with particular emphasis on the effective integration and efficient querying of materials and biological data.

The growth of Web services, sensor networks, and high-capacity storage devices have led to an explosion in the quantity and diversity of data suitable for data mining. Statistical techniques are critical for data mining, but are certainly not the only important part; our work also includes novel applications, software infrastructure for large-scale analytics, privacy preservation while mining data, and new methods and interfaces that extend human capabilities to find patterns in graph and other data. Results so far include effective prediction of cardiac and epileptic events in medical patients, large-scale data extraction from the Web, large efficiency gains in Hadoop and Spark frameworks, and efficient exploration of large-scale real-world networks, including social, communication and brain networks.

IoT-Air pollution monitoring system

An air pollution monitoring system is a great project to help monitor the different particles present in air like led, carbon dioxide, sulphur dioxide, etc that are responsible for air pollution. Sowe can monitor and store all the data on the web servers to check the pollution statistics remotely.

5G Networks and IoT

We have innumerable studies that are trying to quantify and predict the material impact of Fifth Generation (5G) and the Internet of Things (IoT). Some of these focus on the cost aspect and others on the value to society. However, even as these studies are ongoing, it is evident that 5G will spur innovation across many industries and provide a platform enabling emergent technologies such as the IoT to become an integral part of our economy and lifestyle.