Escaping from StraightLine in Ubiquitous Computing

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Abstract

This paper discuss about the working of upcoming technology known as Calm Technology defined as a paradigm shift where a technology become virtually invisible in our life, also known as Ubiquitous Computing. By using this technology if different devices of different operating systems interact, then consideration and requirement that will have to be taken in account are the subject of discussion in this paper.This paper is about the relation of devices having heterogeneous operating systems that are communicating with environment. The applications we use have no manualor direct interaction with the real environment.

Keywords- Ubiquitous Computing; Calm Technology; Heterogeneous Devices; Security

I. INTRODUCTION

Nowadays, usage of mobile devices is increasing because it considered as much powerful hardware, which enable data connectivity and different software's. It is considered as a convenient computing device. Such hardware's are considered as handheld computers, having features of running applications on the platform with some software and operating system. With the passage of time the demand of such devices is increasing because of some powerful features as high processors, large memory space, screen and operating systems.

Ubiquitous computing can be defined as "existing or being everywhere at the same time" [1], situations takeplace in ubiquitous computing is very seal to the real world. In today's research, researchers are focused to introduce the concept of human computer interaction in ubiquitous environment. In UC environment there are number of devices embedded in various stuff at countless spaces. The usage of folk's devices leads us towards a new intelligent environment, where all devices can interact easily from wherever to somewhere[1]. Such intelligent environment can take decision by itself with the help of other devices.

The ubiquitous environment is considered as the personalized computing environment. This requires some security issues. The system must have the ability to prevent from any malicious effect; this will protect the system and did not cause any harmful effect to the complete system.

This is the motivation of moving towards contextual information, where we are free for the usage of any input, output device, any heterogeneous devices and other mobile users: all are connected with such computational environment.

In some cases devices are communicating with in a boundary areas, which is a problem. Consider a device and communicate with in 100 km with its connected system. Under the bounded area device can easily communicate but, as soon as it cross its territory communicating with the system will cause some problem.

Our work will help to avoid the problem by ignoring the distance limit, through which devices can communicate at anywhere. The detection of such devices will be done by sensors, which will sense the devices having different operating system, and also their location at the time of connectivity. The devices used for this purpose will be rich of context application [4].

II. FRAMEWORK OF UBIQUITOUS COMPUTING AND DESIGN GOALS

Ubiquitous computing environment is also known as the technological rich space where all devices can interconnect and consider as the computers. Users can interact with the system in a flexible manner and can use all applications of the system, for making the system much cooperative and interactive. We require some designing goals for different user's appliances.

There are three overarching goals: "adaptability, deployability and aggregation" [2], adaptability and deployability are the central points of ubiquitous computing. In such environment heterogeneity, legacy component and incremental evolution are not considered in exception case [2].

a) ADAPTABILITY

Software's handle dynamic emergence of devices in system evolves context and user preference at different level. Having the feature of dynamic changes adaptability is considered as the basic concept of ubiquitous computing. Adaptive system introduces the basic concept of the requirements which are accepted at different level in the system. This feature may lead us toward the user requirement what he wants in his system, and explicitly controlled by the users. It requires different approaches as;

- ✓ **Laissez-faire approach** states adaptation in a system is totally dependent upon the users, that what he wantsfrom the system without any manual involvement. This is much difficult to deploy in any system. The reason behind this is the size of file may be too large or too short; which is difficult to handle.
- ✓ **Transparent approach**provides all basic needs which system require for making an application adaptable. Due to this, system is responsible to handle all aspects of user demands [3].

b) DEPLOYABILITY

To interact with a system we require some interface through which user can easily interact, for the deployment in context environment there are some requirements and specifications;

- ✓ **Flexibility**- The system should not force the users to follow the same pattern through which the system is designed, in order to introduce the new appliances for the network.
- ✓ **Management**- The deployer is responsible to manage all the resources for application specification, mapping to resource and gathering all resources.

c) AGGREGATION

Generally refers as, "a function in data processing". This function leads us towards the joining of different data packets from a network and makes it possible to transmit it on a network as a single media. This feature is the base constraint of some application running on the system.

III. COSTING

Context-aware systems are planned to enlarge their full prospective in background [7]. Through implementing ubiquitous computing background alteration are made off, associated with our real life. In some cases it is pleasing to introduce the new devices in context aware system. Under which all devices perform their defined role, and give a simulated real world environment.

Such system as designed to provide information that is useful for a specific task. This can be considered as the costing of context. Costing basically provide us a concept that how system is working under dissimilar situations.

IV. SOFTWARE'S REQUIREMENT

For ubiquitous computing system require some software and drivers to run an application. To interact with objective we require some interfaces developed under the low level programming. For the connectivity at the system or environment level we require some sensor application developed under the high level programming (Kernel level construction) [5].

V. DISCUSSION AND RELATED WORK

We can overcome the issue of limit for communicating devices, for this we employ impulsive network as a replacement of ad-hoc network so that devices can freely cooperate with each other in all environments and being anywhere [5]. When the devices spontaneously interoperate with each other they will enable to share information. The devices connect to the network through some central media, which will act as a server (but no actually a server). It will help to devices having "Android" operating system freely interact with each other and devices having heterogeneous operating systems to connect with network by doing some additional checks. Central device will detect first location of device and then scan it for any malicious attack; it will let it to communicate with other devices and resources on the network. When the device having different operating system detected by central media, it will acknowledge to connected device via TCP protocol.

The central media's operating system should be capable enough to detect heterogeneous operating system of device, by embedded sensors, and versions of application available onit.This will make device able to upgrade its versionsso; it could exchange information with other upgraded devices. Here the important issue is how devices keep their private data secure while interacting with other devices available on network.

The operating system of central media will provide security to devices of open source operating system by performing security checks while interacting with heterogeneous operating systems.

Ubiquitous computing makes devices closer to human nature. Their aptitude of making decision according to environment and user moodmakes it more attractive for daily life. It made device much portable and enable to keep more and more information on our finger tips than PCs.

Android have features of Ubicom that make it more powerful. It has features of interpretability, heterogeneity, security, survivability, adoptability and self organization[3].

These make android free from the limitation of bounded area and also makes it flexible to adopt environmental changes according to user mood.

We introduce an application in android that change themes and wallpapers dynamically by sensing user mood. The device senses the mood by the embedded sensor which makes decision of change wallpapers by the user's facial expressions. The application will maintain an image library which handles its functionality.

VI. CONCLUSION

The devices are connected through impulsive network to communicate with homogeneous and heterogeneous operating system. It will make devices free from geographical limitations. Devices will change their behavior dynamically according to user's expressions.Security is also another concern thatwhat we allow the gadget or users to do. To whom it provides trust and how does the device get authenticate. These are all the discussions that will be the corner stones of future work.

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