“Development of Web Based Service Oriented Architecture for Mobile Augmented Reality System”
Chapter - 1

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Augmented Reality is a Concept, beyond the concept of Virtual Reality. Virtual Reality concepts and related tools supports to create an artificial that is virtual environment, which is experienced as well as explore interactively by the user. Augmented Reality concepts with relevant tools do provide interactive experiences with an objective to supplement the real world rather than creating entirely a virtual environment.

Augmented reality has come up with its vision where Digital Domain blends with a substantial amount of research on augmented reality has been carried out in couple of decades, the technology with his improve level of services has started to reach mass users at the bottom. The minimum requirement of simple augmented reality system is a display, A camera for tracking, a processing unit with communication facilities. This components are available a camera cellphones. Research on augmented reality intersects with mobile and ubiquitous computing.
Smart phone have become an excellent platform for running augmented reality application. Smart phone have always on an Internet connection, camera and using high performance camera capturing picture and video, advance sensors give user’s position and location.

Nowadays the Augmented Reality and Mobile Augmented Reality are very powerful features available in mobile devices. The Mobile Device is very widely used by people and lots of different features are produce by various company. Primary requirement for Mobile Augmented Reality System are Camera, Sensors, GPU Support, Network Capacity, Browser Support are very easily available of today’s mobile device. Our goal to design a system is target various range of mobile devices with different OS Platforms but have mention required hardware and also to develop common services use by the laptop or desktop for running the Augmented Reality Application smoothly.

Mobile augmented reality system has required camera for tracking, GPS for position and location, accelerometer sensors for orientation for various types of mobile augmented reality system. Many company are provide the SDK like Wikitude, Layers, Vuforia to give flexibility to the
user to develop the augmented reality application as per their need and publish their content. All the available SDK are used to develop mobile augmented reality system that needs to be installed, and targeted to device platform, when the target mobile device operating system are changed the same application needs to be re-architect. To overcome this problem we apply the Service Oriented Architecture for developing prototype algorithm targeted to various range of mobile device. All devices have different types of Networks Capacity, Sensors availability, Browsers, and camera support. HTML5 have capacity to direct access the media of that device and using it for capturing, recording, and using JavaScript we can access the device Sensors, GPS etc, that’s will more easier and beneficial for developing the Mobile Augmented Reality Application.

Using Browser having support of webGL access all the device hardware and developing web services of various types for using Mobile Augmented Reality System. For location aware augmented reality Application, tracker based augmented reality application, vision based augmented reality and many more flavors of augmented reality application are access using web services. Device hardware is checked at registration time using JavaScript for compatible with webGL supported browser and HTML5 support.
Developing all the area of Augmentation Reality Application using web services and publish them to the server and as per the choice of using the kind of augmented reality application via internet or using wifi. Mobile with different OS platforms and hardware has required criteria first register and get the services for mobile augmented reality system. Using AJAX and ASP.NET, JAVA or any web2 tool as base platform for designing and deploying the web based services for mobile augmented reality system. For accessing camera of mobile device, HTML5 API, webGL supported browser and JSARToolkit open source kit are used for tracking based or vision based mobile augmented reality system.

Mobile Augmented Reality has indicated increasing usage in smart phone. In this regard many researcher are trying to explore this area to give develop improved utility architecture.

Mobile Augmented Reality Are lacking the future development of application used in smart mobile device and also the application develop for targeted device is not compatible / scalable when the operating system are changed. There is a need for architecture suitable for various flavors of mobile devices and the same ways, user can develop own services
using existing mobile augmented reality services. A kind of Software Architecture required developing the mobile augmented reality application for the wide used in mobile/laptop/or desktop as per the user choice.

The careful study analysis of this architecture has indicated the need of service Oriented Architecture is more suitable as compared with client-server, and object oriented architecture for Mobile Augmented Reality Applications.

The Technological growth has brought in remarkable integration level of scattered components used in developing augmented reality system. The availability of smart phone has given significant level of device integration but it is waiting for a suitable service architecture which for see wide spectrum of utility application development. To bridge the gap of this limitation of architecture this research work propose a web based service oriented architecture for Mobile Augmented Reality System that is scalable, portable targeted multiple platform and require minimum installation or accessing using browser.
1.1 Thesis Organization

Chapter 1: Introduction

Chapter 1 Introduces the need of web based service oriented architecture for mobile augmented reality system. Innovation in the Mobile Device and use of mobile device in mobile augmented reality instead of general hardware used so develop the application for one area that target to mobile device but when the device are changed the application needs to be rearchitect and also they need to be setup and install and access by limited users who have the compatible device. Augmented reality application needs more power, memory, processing speeds and communication through network boundaries. To overcome this issue, proposed a architecture that’s more scalable, robust and portable and processing very fast at user mobile device. Chapter focuses on the problem statement with research methodology.

1.2 Chapter 2: Literature Review

Chapter-Two Outlines review of augmented reality application with general purpose hardware and develop software as per the area of the
application. When some part of the application or the area of application change, required to redesign the application, also the battery power, transportation cost are need at remote area. Some users will use the mobile device with some of hardware, target some application area. Application focus will only on the targeted application area and its not work with different mobile device operating systems. Review also the focus on the emerging area of web services innovation and easily accessible at mobile device without network boundaries or operating systems, also the code reusability are the key features. Literature Review mainly focus on three area 1) Use of mobile device in augmented reality 2) Use of web services 3) Different types of Application Architecture.

1.3 Chapter 3 : Review Findings

Chapter Three mainly focuses Review Findings from Past Research, after reviewing the paper from IEEE, Elsevier, there is need for common architecture which focuses on single application develop for some of the augmented reality are accessible on various different mobile devices without worry about operating system, minimum installation and users location.
1.4 Chapter 4 : Proposed Work

Chapter-Four Give the Proposed Algorithm for web based services oriented architecture to overcome the problem solution finding on Literature Review and after various methodology available and the whole architecture will divide in three parts with own logic to handle the application with mobile device hardware.

First part is client who will give the user interface which is gui based to access the application to registered user. All the device hardware like mobile camera front and rear, sensors, gps system, viewing of augmented data to user with the same time to capture data. Second part is Middle Level will focus on to send/receive the data to server from client. The logic mainly focuses on web services who will receive the data from client and send to server for augmentation and also the augmented data get back to client devices. The server part mainly focus for storing application with augment data processing with the type of the area of the application. The application is vision based, Tracker based or only with users location.
1.5 Chapter 5: Research Methodology

Chapter-Five mainly focus on Research Methodology of how to choose architecture from various types of design architecture methodology – Client/Server, Component Based, QOS Based, Object Oriented and Service Oriented. Architecture required for mobile augmented reality is mainly focus on accessible of various flavors of mobile devices with the use of browser so required not or minimum Installation and different area of the application the user will enjoy. So Methodology mainly focus on Service Oriented Architecture as the base architecture for solution of our problems.

Implementation:

Using proposed algorithm, develop the users navigation system who gives the users current location with latitude/longitude and distance between two location. The second application will use the tracker based application accessible through browser having some features like WebGL and display data in 3D.
1.6 Chapter 6 : Conclusion & Scope of Work

Chapter-Six will give the Conclusion of how change the augmented reality application architecture will help to user who develop the different area of application and also discuss the scope of future work how the same application will extend it to Wearable Devices, the new emerging area for users.

Bibliography

Bibliography mention references around 30 from various reputed Journals and from web also.