An Indoor Location Aware Architecture IOT Based Heterogeneity Smart Museum

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ABSTRACT

Whatever we see unique on the television, newspapers and books we can observe very closely and directly in museums, there is a need for smart environment to make your life easier and simpler by implementing Internet of things. IOT based on smart museum environment is the system which relies on a wearable device. This wearable device interacts with the smart environment and act as a museum guide which put together image recognition and localization capabilities. The Bluetooth low energy infrastructure installation is done in the museum to obtain localization information. This system has a cloud processing center to capture the artwork and store the multimedia content available for the user. The service which is aware of location controls the environment status according to user movements.

KEY WORDS: Smart Museum, Localization, Heterogeneity, Background Subtraction Algorithm, Cloud Processing Center.

1. INTRODUCTION

The requirements specification is the first thing to do in the requirements analysis process which lists the requirements of a particular software system including function, performance and security requirements. The software requirements specification gives a detailed overview of the software project, its parameters and goals. It explains user interface, hardware and software requirements how the user see the project and its functionality.

Existing System: Now a day's museum provides visitors with booklets or audio guide and visitors find it boring. All the visitors can't tell the tour in advance, since their interests will vary with one to another.

Problem Definition:

- Museum and art galleries provide visitors with paper booklets.
- Curators give explanations about the art
- It is hard for museums curators to catch the attention of tourists.

2. PROPOSED SYSTEM

The overall structure of the proposed system architecture Localization service is distributed between the wearable device and the processing center. The first one detects the current users position and communicates it to the processing center. Here, the localization information is stored and made available to other services. The information is also used locally to speed up the image-processing algorithm.

Background subtraction algorithm is able to detect, in real time, the artwork observed by the user. It can quickly analyze the video frames captured by the wearable vision device and identify the target object with high accuracy and reliability. The result of the processing activity is then sent to the processing center. Processing center is the core of the business logic. It accesses, in the Cloud, the cultural contents required by the users and smartly provides such contents on several interactive platforms. Then, it allows the execution of several location-aware services by providing them with the positioning information coming from the localization infrastructure.

Proposed system can be done in the following phases:

- Cloud Contents and Room Creation.
- Cloud Contents and Media Upload.
- Background Subtraction Algorithm
- Processing center.

Cloud Contents and Room Creation: In this module, the museum administrator has login and they can update their works for each specific rooms based on the Bluetooth low energy type. First we start a new room with assigning new BLE Id in a particular art works. And then we create a next room to be added the same way. Each room have many number of artwork included based on administrator .And then classify for room names like (Historical room, Technical rooms). And also they are able to update the multimedia content for each artworks with particular room based on BLE id. And then for each art works they can upload the video, audio and the text and then content can be uploaded in a cloud.

Cloud Contents and Media Upload: In this Module, We are uploading media content. And we can renew the multimedia content for each artworks with particular room based on BLE id. And then for each art works they can upload the video, audio and the text and then content can be uploaded in a cloud. In this multimedia based on art

content. And also video, audio, text files have n number of sizes not a fixed sized. In this media uploading way to store on room name and then BLE id.

Background Subtraction Algorithm: It is distributed between the wearable device and the processing center. The first we can detects the current user's position and communicates it to processing center. In a user mobile device to pairing with the particular room BLE to aware the android device. Here, the localization information is stored and made available to all the other services. The information is also used locally (on the wearable device) to speed up the image-processing algorithm. It can quickly analyze the video frames captured by the wearable vision device and identify the target object with high accuracy and reliability. We are using background subtraction algorithm to capture the art to analysis and then get the result to particular user to frame by frame. And then the algorithm gets an artwork frame to proceed with the result. The result of the processing activity is then sent to the processing center.

Processing Center: In this Module, It is the core of the business logic. It accesses, in the Cloud get a image from artwork and then comparing to particular art and then contents required by the users and smartly provide such contents on several interactive platforms. Then, it allows the execution of several location-aware services by providing them with the positioning information coming from the localization infrastructure. These services enrich the cultural experience of the users by immersing them in a real interactive. To get a artwork Documents like that audio, video, text, author name to proceed given user mobile device .User can see given artwork media content.

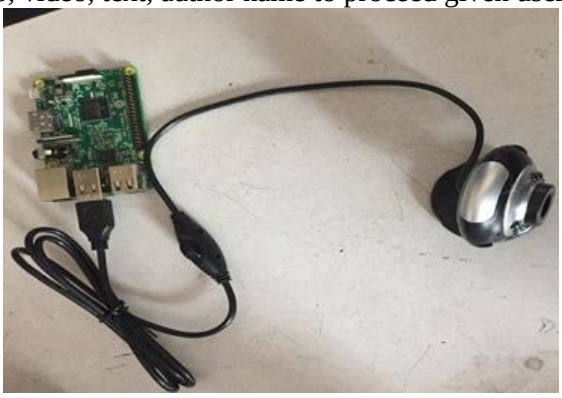

Figure.1. The wearable device model

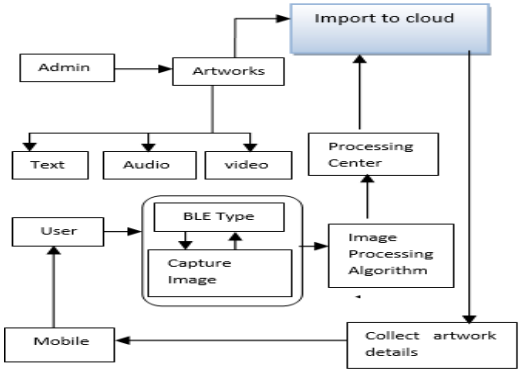

Figure.2. System Architecture

Background Subtraction Algorithm: In background subtraction algorithm, an art objects is given as input and read the total pixel value of a object to identify the foreground objects from the given image. It subtract all other mean background objects from the given image or input. Then apply a threshold limit to find the absolute foreground object.

The following sample figure shows the clear view of this algorithm,

In a given figure, the first shows the background image and next is the foreground image. The foreground RGB image is transformed into binary image and next image shows RGB image converted to gray scale image. Then next one shows foreground result and last shows the background subtracted image.

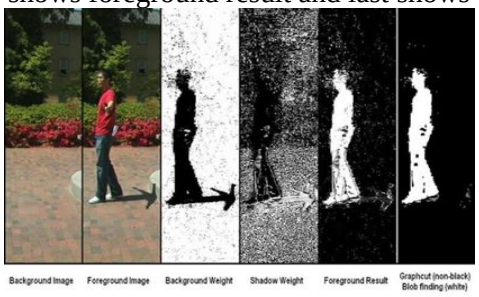

Figure.3. Implementation

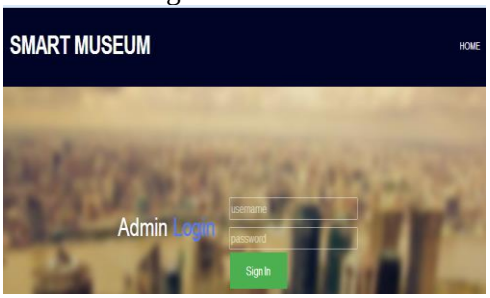

Figure.4. Admin login

Figure.5. Rooms Add/Delete

Figure.6. Upload Art

Figure.7. Add multimedia content

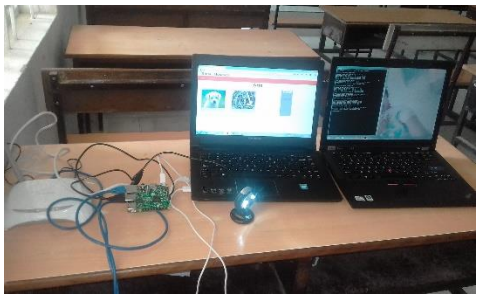

Figure.8. Full Implementation

Future Enhancement: The wearable device camera which is with the user can have very fast head motion when she is looking for some sculpture and the device captures a blur image. So we can enhance the task to get a clear image in the user position.

3. CONCLUSION

The location aware architecture which is indoor inside the museum, improves the user's experience. The wearable device, that is used here, put together art recognition and localization capabilities, thereby providing intellectual contents for the art.

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