CLOUD-BASED AUGMENTED REALITY SYSTEM

LCT3-13

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Overview

Cloud: not only a method of saving data in an external place, where it is a virtualized pool for saving data, through the network, but also a method of computing without the usage of the processor from a client side.

Augmented Reality (AR): a combination of the real-world and the virtual environment.

Current technology:
- Most AR applications require physical markers which arise limitation on what and where to be shown.
- GPS navigation system cannot be applied to indoor location.
- HOGST current path advisor is not a real-time system.

The main goal of this project is to implement an Android mobile application of an AR System with Cloud Storage to be used in the HKUST campus.

Objectives:
1) To build a user-friendly AR application
2) To have a competitive performance AR System without extensive hardware requirements
3) To develop a real-time path advisor to show the path on a real-time camera image view

Methodology

A cloud-based platform for users is to identify their locations and surroundings in campus. MySQL is used to setup the database to store object identification data in the server. Java is used to implement the program for different functions used in the system. Also, it requires a program to build a link for communication between users and the server. The entities of the system include 6 modules:

- Camera Preview Module
  - Using built-in camera
  - Get real-time image

- Graphical User Interface
  - A platform of the system
  - User-friendly

- Indoor Positioning Module
  - Get user’s current position in campus
  - Fingerprint Method

- Object Identification Method
  - No QR code
  - Using location to identify object

- Device-Server Communication Program
  - Connection between devices and the server

- Path Advisor
  - No path on the map
  - Show direction of target
  - Dijkstra’s Algorithm

System Block Diagrams

- Client
  - Draw Map

- Internet
  - RSS scan
  - Select Start Point & Destination

- Server
  - RSS Fingerprint
  - Object Identification
  - Location Identification
  - Path Calculation

- Database

Results

- Showing Object’s Information
- Showing User’s Current Location
- Showing Path Direction
- Indoor Positioning
- Upgraded Path Advisor