# Campus Navigation APP with Augmented Reality Techniques

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## Abstract

Abstract—For all the newcomers to the college campus it's difficult to find all the places, whether it's the cafeteria or the library. Therefore, in this research, a mobile application was built for campus navigation. The underlying technology upon which the appliance was based is augmented reality, which was wont to enhance the standard and simple use of the appliance, as users could get the information easily. Communication with teachers was abundantly quicker than in the ancient approach. In future work, we shall extend the system to incorporate all faculties and add more features, like 3D objects and live chat with the administration. Also want to involve the Computer department in developing the application so that any faults can be reported and data updated directly.

## 1. Introduction

The goal is to save and avoid wasting max amount of time.

For work and education time plays an vital role. In general, school students—especially new students—waste time searching for specific employees or ways to contact academic/non-academic teachers. The staff has the same problem as they waste time looking for a specific classroom, finding classrooms with special tools, or determining the availability of some labs and classrooms. To solve this problem, we aim to build an application utilizing augmented reality (AR) technology for use as a guide in the Sinhgad Academy of Engineering.

"Augmented reality may be a approach of fusing the virtual world, by overlaying digital knowledge on real-world views. In alternative words, it's alive, direct or indirect read of a physical, real-world atmosphere whose components are 'augmented' by pc generated input like sound, video, graphics or GPS". "The applications of AR are divided into 2 categories: initial, marker-based applications use a camera to acknowledge a marker, or an picture from the actual world, calculating its position and orientation to augment the reality. Second, location (or GPS)-based applications use GPS tools to find relevant data related to a location and augment it on screen".

## 2. Problem Statement

There are some issues that cause students and teachers to miss or delay classes. These issues are also faced by non-academic staff members. Issues include having difficulty getting some information about the college buildings and different rooms. Lecturers need to know whether a classroom is available or occupied by another staff. Lecturers lose their time if the laboratories have insufficient numbers of computers or if some labs do not have access to the computers as they have to shift students to different labs. Students have difficulty contacting staff or academic members, and some students do not know how to contact staff, so they must return to the staff offices again and again. Finally, people who are new to the college campus have trouble locating their labs or classes as well as finding academic members' names and office locations, and admin sections.

## 3. Problem Solution

To solve the identified problems, a proposal of creating a mobile application to provide a new innovative way to acquire information about the College. The doors of classes and laboratories will have certain QR codes on them which the user can scan with the help of the camera option in this application which will show him all the information that he/she wishes to see. All the additional information such as email, phone numbers, or office hours of a specific staff member will be shown on the application. This application is helpful to both students and staff members and will also save their time as all the necessary information will be available in seconds. Also besides, making use of new and advanced technology can save ink and paper products.

## 4. Methodology & Algorithm

In recent years, AR has been developed and unfold considerably. AR applications ar employed in many alternative fields, like education, games, and GPS, and each one among these applications uses completely different functions reckoning on the appliance field. AR may be a direct or indirect read of digital data as second or 3D objects within the real-world atmosphere that has been enhanced/augmented by adding virtual computer-generated data thereto. AR is each interactive and registered in 3D whereas combining real and virtual objects . AR applications became common and offered on sensible devices and are getting visible in several media, like news, sports, and others. it's a strong and easy technique that anyone will use.

**Location-Based AR**

The AR interface determines data like position, the direction of locations, or objects supported the user's position within the universe. In markerless AR, the system uses the web or GPS to assemble pictures and displays them at a selected location. It doesn't want a marker to show the data, however it's thought of a lot of interactive than marker based mostly augmentation.

**Marker-Based AR**

In general, marker-based increased reality uses a camera to acknowledge a picture or marker, like a QR/2D code, to provide a result only the marker is perceived by a reader. The markers give a reference system for manufacturing graphical overlays over the physical elements.. AR applications use a good range of various marker varieties. There ar 2 forms of markers because the main categories: example markers and second barcode

markers. A example marker may be a black-and-white marker that has a picture within a black border. Detection systems compare the image and also the marker; if they have to link a lot of knowledge, the user should use a info.

**Algorithm**

For path finding, the favored Djikstra algorithmic rule determines all doable nodes, taking into consideration their various prices. Once the ways are visited, the algorithmic rule finds the varied ways to the answer and determines the most effective by scrutiny their prices [6]. it's the foremost well-liked algorithmic rule thanks to its potency in pathfinding. A* is one well-liked search algorithmic rule, projected in 1968 by Hart et al. [7]. it's wont to realize the most effective path between 2 points, minimizing the price of the trail. as a result of its smart performance and low process price, it's well-liked for optimizing ways, as an example in AI [8]. It differs from the Dijkstra algorithmic rule in this it uses associate heuristic to estimate the price of the trail that must be traversed to achieve the destination. If the heuristic is sweet, A* features a smart performance. If the heuristic is unhealthy, the performance is also compromised. A* may be a complete algorithmic rule, which implies that if there's resolution|an answer it'll forever realize that solution at some purpose of the search tree. it's conjointly optimum, which implies it forever finds the most effective resolution doable. it's associate privy search technique, that depends on associate heuristic to form a call. The heuristic is associate estimate of the gap between this node and also the target purpose. within the gift analysis, the heuristic is that the line distance between {the purpose|the purpose} of the map wherever the user is and also the next target point to be visited. The algorithmic rule works attempting to reduce the total of the distances already traveled to node n, that is typically referred to $g(n)$, plus the distance still expected to travel to the goal, given by the heuristic $h(n)$,

In the equation, $f(n)$ is the function that needs to be minimized.

$$f(n)=g(n)+h(n) \quad (1)$$

For each candidate path, A* creates a search tree from the starting node to the goal node. Then for each node n of the path, it calculates f. The best path is the path with the lowest f.

## 5. Conclusion

On top of proposal may be a novel field navigation APP that uses increased reality to produce users with a replacementand attention-grabbing thanks to meet our field. As a future work, we tend to will extend this faculty Guide to incorporateall colleges settled at Sinhgad Technical Education Society.. creating the system compatible with completely different inoperation systems, like iOS, and add a lot of options, like 3D objects and modify live chats with administration.

## 6. References

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