

# Problem Statement and Goals

## Software Engineering

Team #2, Campus Connections

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Table 1: Revision History

Date	Developer(s)	Change
Sept 25	Everyone	Revision 0
Date2	Name(s)	Description of changes
...	...	...

## 1 Problem Statement

[You should check your problem statement with the problem statement checklist. —SS] [You can change the section headings, as long as you include the required information. —SS]

### 1.1 Problem

University students often face challenges in maximizing their campus experiences and effectively connecting with peers and resources in an increasingly digital age. While existing social media platforms offer connectivity, they lack the immersive and location-specific features necessary to foster meaningful interactions within the university community. One of the main purposes of this project is to allow users to interact with each other on campus, as well as find and join events around the main campus of McMaster University. In addition, this project will allow users to navigate campus through an immersive user experience and find information on the availability of different rooms inside the buildings.

## 1.2 Inputs and Outputs

- Inputs
  - Geographic data
    - Limiting the scope to the main campus of McMaster for this project.
    - This may be increased for further support in the future.
  - Visual data
    - Used for AR to complete various tasks of the application.
  - User actions
    - All the user interactions users can do in this app, including interactions with the building and peers.
  - User settings/preference
    - Values that will change the output to the user's likings. Will be used to personalize the application for better social interactions.
  - Event schedule data
    - The schedules of events/lectures happening on campus.
- Outputs
  - Navigation data
    - Locations of campus buildings and rooms.
  - Friend user locations
    - Locations of online friends.
  - Lecture hall/Events availability and schedule
    - Shows whether the room is occupied by an official event or lecture.
  - Messages from other users
    - Allows better coordination and social interactions with other users.

## 1.3 Stakeholders

The following stakeholders will be able to locate the lecture halls and navigate the campus better. Find peers with ease and enhance the university experience.

- Current McMaster students
- Incoming McMaster students
- Youth touring campus

The following stakeholders can expect more students to find their clubs and events, increasing the visibility and activity. Access better data on student interest and interactions.

- McMaster club owners

- McMaster Admin
- McMaster Faculty
- Project Supervisor (Dr. Irene Ye Yuan)

## **1.4 Environment**

### **1.4.1 Hardware**

- The application should utilize sensors that are needed to collect geographic and visual data
- The application should support all devices supported by the platform that have the necessary sensors

### **1.4.2 Software**

- The application should be supported on Android and iOS mobile devices that are able to connect to the Internet
- The application should be compatible with all required libraries and plugins

## **2 Goals**

### **2.1 Accurate Data Collection**

The product must collect location and directional data to accurately ascertain the position of the user in the building and campus. The error of data must be less than 5%. This will allow the user to interact with the system and other users of the product to enhance social interactions.

### **2.2 Ease of Use**

The product must be user friendly and convenient to use, as many university applications are not used or underused due to the complexity and difficult operation. The end user must be able to easily download and learn the application without external guidance. At least 90% of users should feel comfortable about the product when conducting the user survey.

### **2.3 Availability**

The product must be able to support its users unless there is a planned maintenance or external failures outside of our control. This is important as the product is using real-time data and significant delays or down-times will impact the accuracy and usability of the product.

#### **2.4 Reliable Data Communication**

The product must have good and secure data communication to support the real-time nature of the product. This is important as the product is using real-time data and significant delays will impact the accuracy and usability of the product. The product must be able to provide the desired output within 5 seconds with good university WiFi connection.

#### **2.5 Protection of Personal Information**

The product must keep all personal data provided by users secure in the database. Personal data will be collected securely and only used for product functions. The application must support the removal of user data upon request. This is important because users will complete a consent form that acknowledges the collection of sensitive data and we must adhere to them.

#### **2.6 User Communication**

The product must be able to support user-to-user communication. It should provide a friend system for users to add new friends, send messages and emojis to friends and share current location and status (in lecture/event or free) with their friends. This is important because the main purpose of the project is to allow users to connect with peers effectively.

#### **2.7 Interactable Campus Buildings**

The product must be able to provide interactions between users and campus buildings. It must show the availability of the lecture halls and information about ongoing events in a building since one of the purposes of the project is to help users utilize campus resources effectively.

#### **2.8 Immersive User Experience**

The product should provide an immersive user experience to the users with some XR technologies. At least 90% of the users should find the product much more attractive and immersive than other university applications when conducting the user survey. An immersive user experience is one of the unique selling points of our product.

### **3 Stretch Goals**