

CMPUT 401

Campus Maps

Requirements Document

Project Summary

The Campus Maps team is striving to provide a real time, user-friendly pathfinding experience across all of the University of Alberta campuses. Currently anyone who would like to find their way around using campus maps can do so, but the path provided does not give you directions directly to a door or specific service inside of a building. Our team plans to fulfill this need. Currently, the interiors of the buildings are mapped and viewable on the web but no paths are drawn indoors. Our team intends to provide a thorough and rich map experience. Currently, the campus maps web portion and the app are run off separate logic and infrastructure. Our team plans to centralize the campus maps experience.

We envision seeing anyone unfamiliar with campus using this service to find a specific door, something to eat or drink, or even the warmest route during those cold winter days. One will also be able to add waypoints to a specific path. For example, one could plot a path of classrooms, with coffee and bathroom stops along the way. This could be a user's entire day at school, all mapped out beforehand. We therefore envision students at the start of each semester finding the perfect route to fit their schedule easy and stress free. Another example would be a disabled route, taking into account both stairs and elevators when planning the route. We would like to see this service working on modern browsers, accessible by both computers and mobile devices. With the phonegap capabilities this browser version will be easily wrapped into native apps for both iOS and Android.

User Stories

No.	Story	Priority	Status
1.	As a user, I want to view a map of my current location.	HIGH	Implemented
1.1	I want to see an exterior map of the school around my current location.	HIGH	Implemented
1.2	I want to see the interior map of the building at my current location.	HIGH	Implemented

User Stories (Continued)

No.	Story	Priority	Status
2.	As a user, I want to select a building from the exterior map, and be shown its interior map.	HIGH	Implemented
2.1	I want to see an interior map of the building I selected .	HIGH	Implemented
2.2	I want to view different floors of a building I selected.	HIGH	Implemented
2.3	I want to see room labels on the rooms.	HIGH	Implemented
2.4	I want to see interior emergency exit locations.	LOW	Not currently possible, API limitation
2.5	I want to see interior spaces in a different color depending on function.	MEDIUM	Implemented
3.	As a user, I want to select a point on the exterior map for finding a path.	HIGH	Implemented
4.	As a user, I want to select a point on the interior map for finding a path.		Implemented
5.	As a user, I want a path drawn between two chosen points so that I can navigate.		Implemented
5.1	I want to path to point me to the proper exterior door if the path enters or exits a building.		Implemented for SUB, CAB, CSC. API limitation on exterior door locations.

User Stories (Continued)

No.	Story	Priority	Status
6.	As a user, I would like to select how my path is found.	MEDIUM	Implemented
6.1	I would like the shortest path possible.	HIGH	Implemented
6.2	I would like to spend as little time as possible outside.	MEDIUM	Future Iteration
6.3	I would like to spend as little time as possible inside.	MEDIUM	Future Iteration
7.	As a disabled user, I want my path to be free of stairs.	MEDIUM	Implemented for SUB, CAB, CSC. API limitation on exterior door locations.
8.	As a user, I would like to be able to alter the suggested route.	MEDIUM	Implemented
8.1	I want to add extra waypoints to my route.	LOW	Implemented
8.2	I want to be able to reorder the waypoints of my path.	LOW	Implemented
9.	As a user, I want to be able to find services near my route.	HIGH	Implemented
9.1	I want to be able to update my route to include extra service waypoints e.g/ a coffee shop	HIGH	Implemented
10.	As a user, I want to be able to enter multiple rooms in order to build a complex path.	LOW	Implemented

Use Cases

Use Case Name	01: Campus Pathfinding
Priority	HIGH
Participating Actors	User
Goal	To find a path between two locations on campus
Trigger	User clicks “Get Directions” under the “Create Path” submenu of the sidebar.
Precondition	User has selected at least two waypoints
Postcondition	A traversable path is drawn between the points
Basic Flow	<ol style="list-style-type: none">1. User selects at least two points: any indoor or outdoor locations.2. User click the “Get Directions” button3. User is shown the shortest traversable path3.1 (Optional) User has previously selected the Disabled User checkbox and is shown a path which does not use stairs.
Exceptions	<ol style="list-style-type: none">1. <i>No path can be calculated these two points</i>: User is notified that no path exists.2. <i>No stairless path can be calculated these two points</i>: User is notified that no stairless path exists.
Qualities	Intuitive, Quick(full path rendered in less than 5 seconds)
Constraints	<ol style="list-style-type: none">1. User must select at least two distinct points.2. User must be shown a traversable path.3. Disabled Users must not be directed to stairwells.
Includes	none
Extends	02: Location Selection
Corresponding User Stories	5, 6, 7, 10

Use Cases (continued)

Use Case Name	02: Location Selection
Participating Actors	User
Goal	To select a building, door, classroom, or other selectable map location to receive more information about it, or to use it as a pathing waypoint.
Trigger	User clicks on a selectable location
Precondition	User is at the map overlay screen (interior or exterior)
Postcondition	The location is highlighted. Information and pathfinding buttons are shown.
Basic Flow	<ol style="list-style-type: none">1. User is at the map overlay screen (interior or exterior)2. User selects a building, door, classroom, or other selectable map location by either a mouse click or a touch event.3. The point is highlighted. A popup is shown which displays information about the selected object, along with buttons to use the point in forming a path, or viewing the interior map (if possible).
Exceptions	none
Qualities	Intuitive, Quick(popup shown in less than 1 second)
Constraints	none
Includes	none
Extends	none
Corresponding User Stories	3, 4

Use Cases (continued)

Use Case Name	03: Current Location
Priority	HIGH
Participating Actors	User
Goal	To view the users current location on the exterior map
Trigger	User clicks the “Current Location” button in the sidebar
Precondition	None
Postcondition	User is shown current (approximate) location with a blue dot
Basic Flow	<ol style="list-style-type: none">1. User clicks the “Current Location” button in the sidebar2. The location is displayed with a blue pin2.1 If the user is on a mobile device, the application will continually update the users movements via device GPS.
Exceptions	<ol style="list-style-type: none">1. <i>User cannot be located</i>: User is shown an error message describing that they cannot be located.
Qualities	Intuitive, Quick (location found and rendered in less than 2 seconds)
Constraints	<ol style="list-style-type: none">1. User must have location services turned on.
Includes	none
Extends	none
Corresponding User Stories	1

Use Cases (continued)

Use Case Name	04: Interior Map Viewing
Priority	HIGH
Participating Actors	User
Goal	To view the interior floors, rooms, doors, emergency exits, and services of a building
Trigger	User selects a building and click “Interior Map” button from the popup
Precondition	User is at the Exterior Map overlay
Postcondition	User is presented with the Interior Map of the selected building
Basic Flow	<ol style="list-style-type: none">1. User selects a building and click “Interior Map” button from the popup.2. User is shown a navigable Interior Map overlay, which shows the floors, rooms, doors, and services of the selected building.
Exceptions	<ol style="list-style-type: none">1. <i>User cannot be located</i>: A message is displayed to the user showing that an error has occurred.
Qualities	Intuitive, Structured, Quick (rendered in less than 2 seconds)
Constraints	<ol style="list-style-type: none">1. Building must have interior map overlay.2. Building must be selectable from exterior screen.
Includes	none
Extends	02: Location Selection
Corresponding User Stories	2

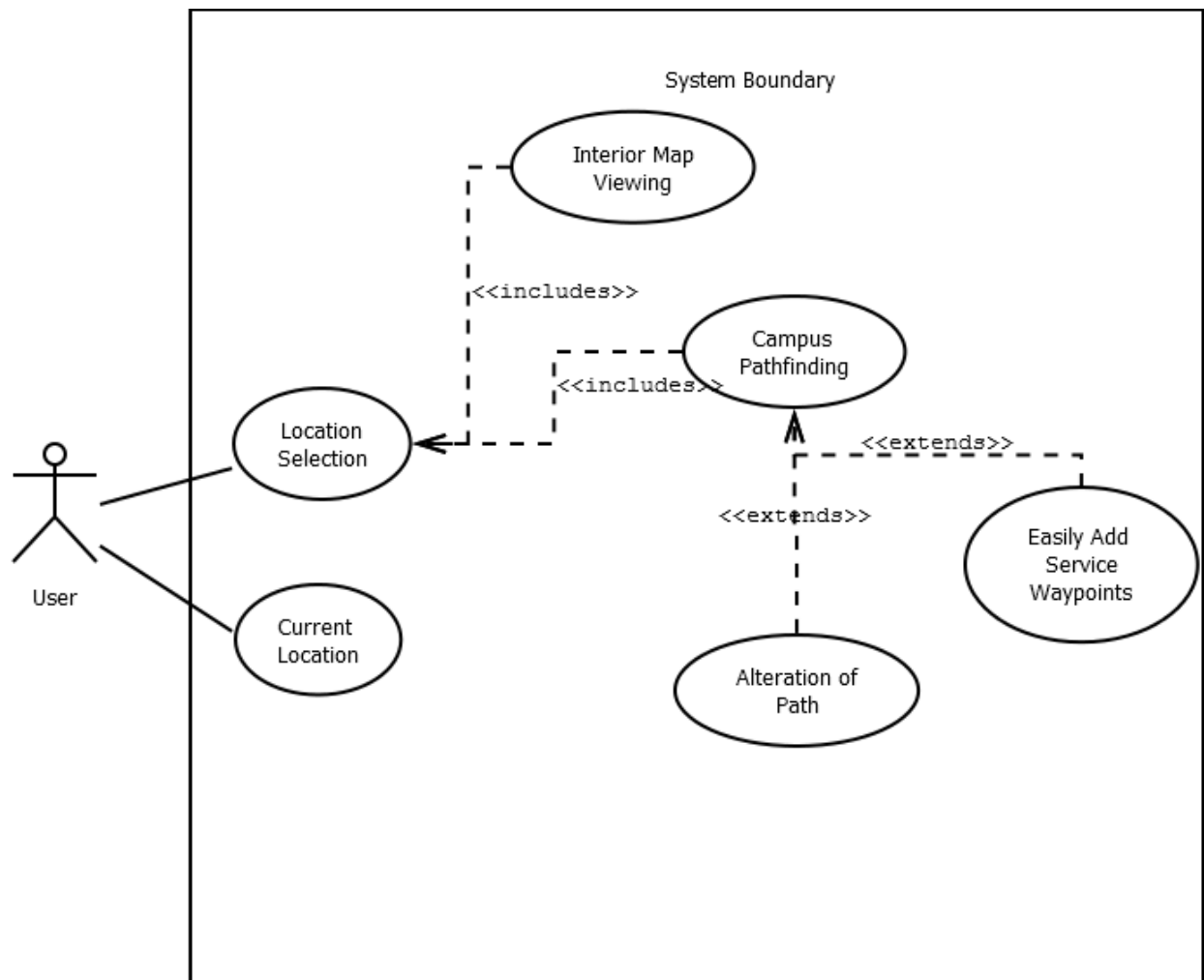
Use Cases (continued)

Use Case Name	05: Alteration of Path
Priority	MEDIUM
Participating Actors	User
Goal	To modify the presented path
Trigger	User clicks the “Edit Waypoints” button under the “Create Path” submenu in the sidebar
Precondition	User has selected at least two waypoints
Postcondition	User’s waypoints are restructured
Basic Flow	<ol style="list-style-type: none">1. User clicks the “Edit Waypoints” button under the “Create Path” submenu in the sidebar.2. User is shown a list of current waypoints, which can be rearranged, and some may be removed.3. The user click “Get Directions” and the path is redrawn.
Exceptions	none
Qualities	Intuitive, Structured
Constraints	1. User must be shown a traversable path.
Includes	none
Extends	01: Campus Pathfinding
Corresponding User Stories	8

Use Cases (continued)

Use Case Name	06: Easily Add Service Waypoints
Priority	HIGH
Participating Actors	User
Goal	To add coffee or other service waypoints to my current path.
Trigger	User opens the “Services” submenu from the sidebar, and selects a service
Precondition	none
Postcondition	User’s service waypoint is added to the path.
Basic Flow	<ol style="list-style-type: none">1. User opens the “Services” submenu from the sidebar, and selects a service.2. The corresponding services are shown on the map with pins.3. The user clicks on a service pin for more information.4. The user clicks the ‘Directions’ button in the popup.5. The user clicks the “Get Directions” button, and the path is redrawn.
Exceptions	none
Qualities	Intuitive, Structured
Constraints	none
Includes	none
Extends	01: Campus Pathfinding
Corresponding User Stories	9, 10

Use Case Diagram



Glossary

User	A User is any person viewing the application. This User may choose buildings or locations, and see more information about them, or to form a Path including them.
Coordinate	A Coordinate is any location on the map, identified by its latitude and longitude.
Disabled User	A Disabled User is any person viewing the application who cannot use stairwells due to physical disability. This user has checked the corresponding option under the "Create Path" submenu in the sidebar. This user information is cached for return visits.
Interior Map	An Interior Map is a graphical layout representing hallways, rooms, stairwells, elevators, and interior doors of one distinct building.
Exterior Map	An Exterior Map is a graphical layout representing the physical location of outdoor pathways, external doors, and buildings.
Path	A Path is a traversable route from one point, Source, on an Exterior/Interior Map to another point, Destination. This path may include other Waypoints.
Stairless Path	A Stairless Path is a traversable route from one point, Source, on an Exterior/Interior Map to another point, Destination that does not direct the User up or down stairwells.
Indoor Path	A Indoor Path is a traversable route from one point, Source, on an Exterior/Interior Map to another point, Destination, but attempts to route the user down a path that is as indoors as possible.
Outdoor Path	A Outdoor Path is a traversable route from one point, Source, on an Exterior/Interior Map to another point, Destination, but attempts to route the user down a path that is as outdoors as possible.
Source aka Start Point	A Source is the starting location of a path, represented by a point on the Exterior or Interior Map. This could also be the location of the User.
Destination aka End Point	A Destination is the ending location of a path, represented by a point on the Exterior or Interior Map.
Floor	A Floor is a portion of an Interior Map bounded by exterior doors, stairwells, and elevators.

Exterior Door	An Exterior Door is any door, where upon passing through it, transitions the User between Exterior and Interior Maps
Interior Door	An Interior Door is any door, where upon passing through it, does not transition the User into an Exterior Map. This door may or may not transition the user between different Interior Maps
Emergency Exit	An Emergency Exit is any door, which should only be used in case of emergency and should never be shown to the user as a valid Exterior Door.
Selectable Location	A Selectable Location is clickable location on the Exterior or Interior map overlay.
Transition	A Transition is any user movement, through an exterior door or stairwell, which requires a new Interior or Exterior map to be drawn.
Service	A Service is any location where a User can get coffee, food, or related items.
Campus	The Campus simply refers to the grounds and buildings of the University. The term campus applies in general to each of the Universities locations.
Waypoint	A Waypoint is any generic point on the map which is part of a path.
Route	A Route is any previously drawn path, which is cached by the system for future viewing.