

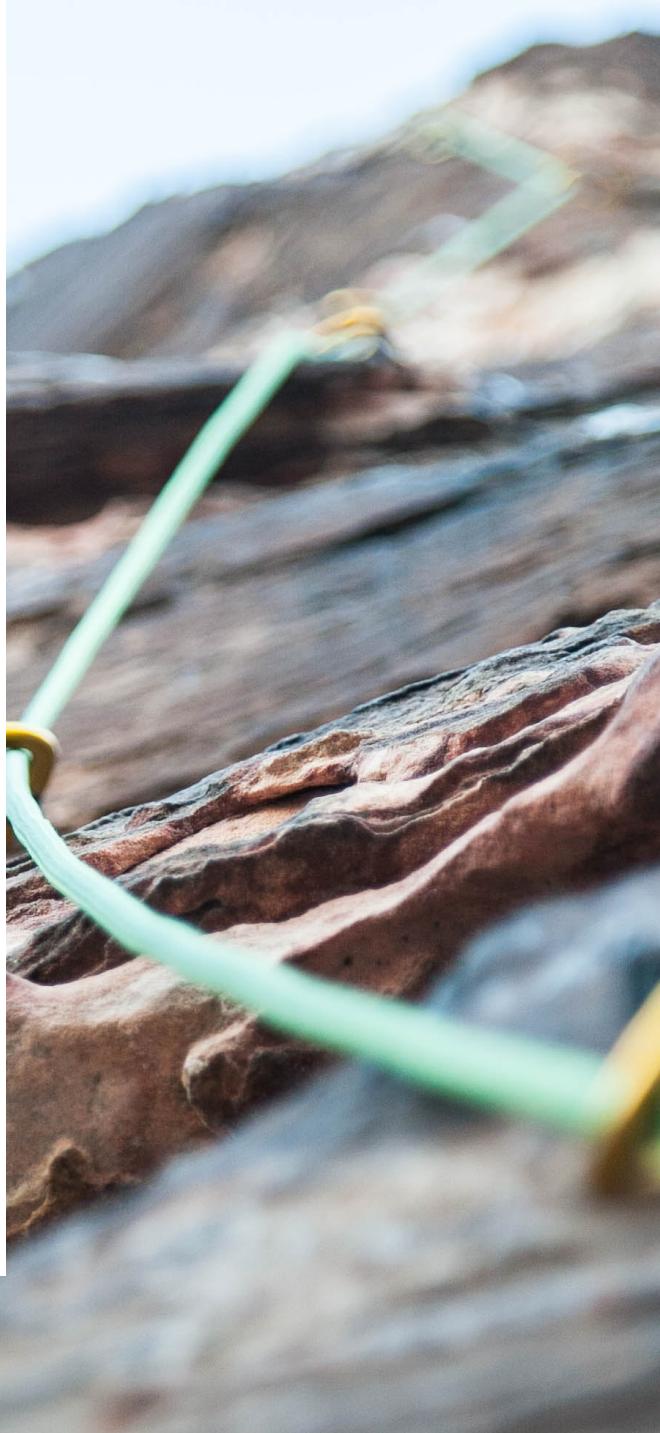
AR CLIMBING APPLICATION - RESEARCH

CPSC 481 - Fall 2020

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Repo: <https://github.com/lysterjason/CPSC-481-Term-Project>

Portfolio: <https://cpsc-481--project-portfolio.web.app>



APPLICATION DESCRIPTION

Our application is an augmented reality (AR) mobile application that solves the problem of rock climbers not being able to find routes that they wish to climb. The user would log in to the application and the mobile device would be pointed at a wall. Specific climbing routes would then be outlined on the phone via AR. When there are many different routes at the user's location, the routes can be filtered by grade (difficulty), name, and rating.

Once the user climbs the route that they found through the application, they can leave a rating and any tips they might have for other users. The climb would then be added to their personal logbook of climbs. This logbook can keep track of climbs that you do and recommend other climbs based on your perceived skill level. Other users could also view your profile and see the climbs that you have done. Each user can show featured "personal favorite" climbs as well for both their own and other's reference.

Finally, any routes that may not be in the application can be mapped out so others can see them in AR. Any route that you wish to add can then be given a name, difficulty, location, pictures, and any other necessary information. This application would primarily be used by outdoor climbers where routes are often much more difficult to find compared to a gym. Experienced climbers often create their own climbs so this would also be a platform for them to share their works with others. Lastly, the application would foster a greater sense of connection within the climbing community as people showcase their abilities and favorite climbs for others to try.



STAKEHOLDERS



Rock Climbers

As the intended audience for our project, rock climbers will use this app to help them decide which routes they want to climb when rock climbing, and allow them to filter which routes they want to climb by means of difficulty. These climbers can also discover new routes since routes can be added in by other users, and they can also upload their own routes if they desire.

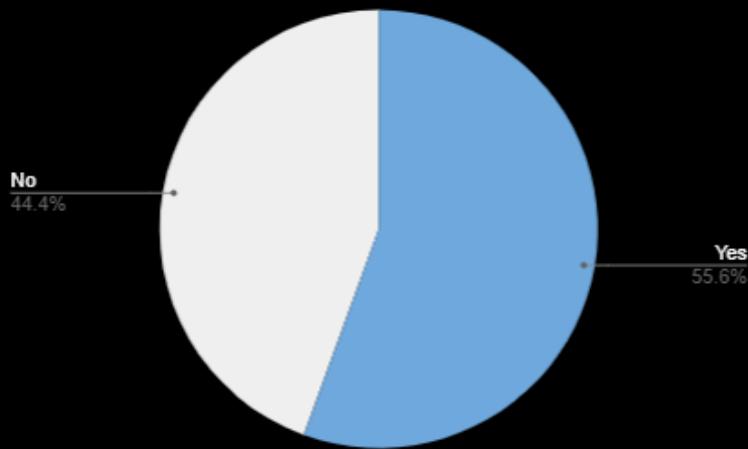
Route Creators

For this group of people, our app will allow route creators to upload the routes they have created while rock climbing, and share them with other rock climbers. It will also allow the creators to name their routes and set the difficulty levels for the routes they create and upload, along with pictures and a description of the route they have created.

Climbing Guides

For this group, our app will allow climbing guides to select and filter routes by difficulty, while also giving recommendations to these climbing guides of which routes to showcase or explore the next time they go and rock climb with other groups of people. The guides can also mark routes they use as favorites to access them quicker within the app.

% OF CLIMBERS WHO HAVE HAD TROUBLE FINDING A ROUTE



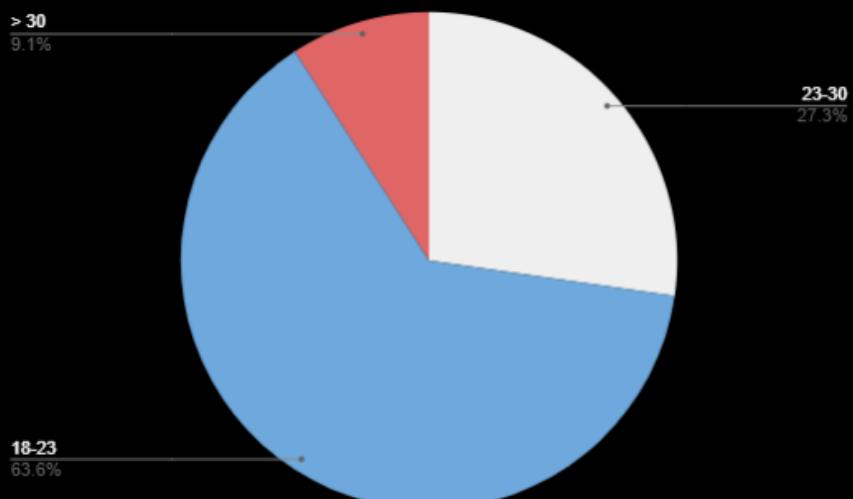
SURVEY DETAILS

First, we used the Surveys and Questionnaires method in order to quickly elicit answers to questions from a more broad audience. The questions asked in the survey assessed the climber's age group, skill level, history of running into the problem that we are looking to solve, how they solved the problem of not being able to find their route, and features that they think would make the application more intriguing (Appendix A).

SURVEY RESULTS

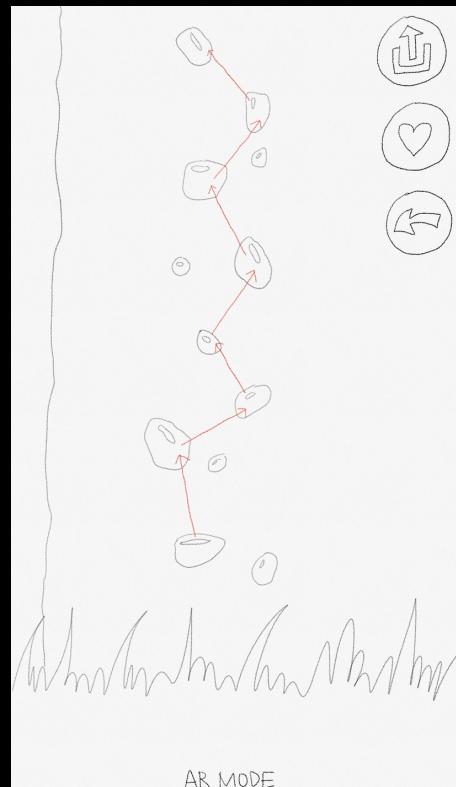
From this survey, we found that out of climbers from all skill levels, approximately 55% found themselves in a position where they could not find a climbing route. This 55% tended to be climbers who placed themselves in the upper echelon of climbing skills. The survey also showed that users were very interested in profile features where they could log their climbs, and view other's climbs. This showed that social features would be key in gaining interest in our application.

AGE GROUP OF SURVEY PARTICIPANTS



PAPER PROTOTYPES

For the second research method, we chose to do Paper Prototyping. This allowed us to organize and view initial concepts for our design and learn what works and what does not work. Various screens including an explore page, favorites page, and AR camera page were sketched out quickly. By showing these paper prototypes to different individuals, we learned which layouts were preferred and allowed for the most ease when navigating through the different screens. These prototypes were also shown to each group member, and through these, we were able to brainstorm different layouts and iterate through additional ideas based on the feedback. After all of these iterations, our paper prototypes were much more refined (Appendix B)



AR MODE

EXPLORE

Popular in your area...

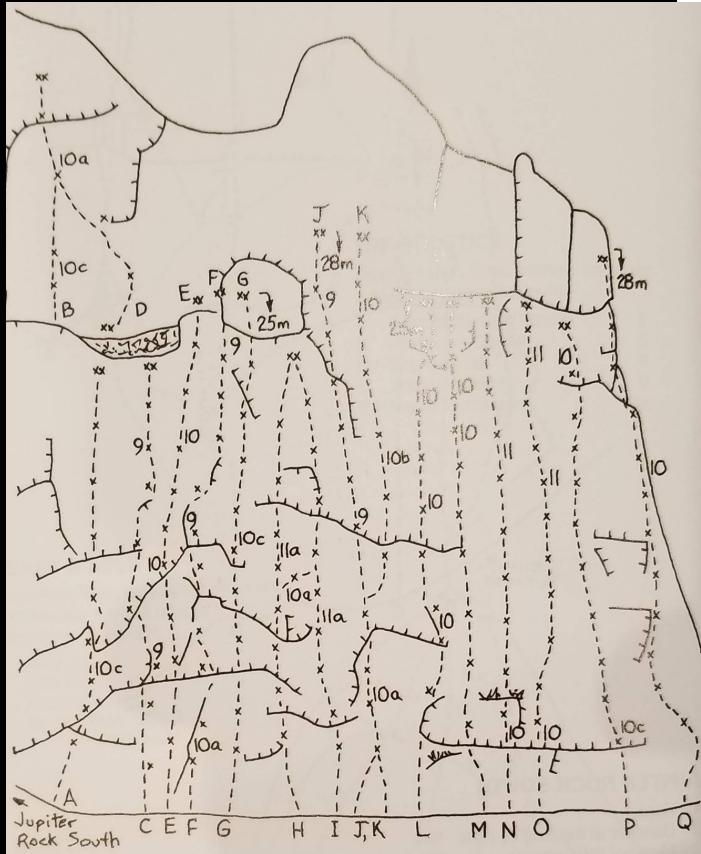
- Route 7
location: 123 Climbing, Calgary AB
difficulty: master
rating: ★★★★★ (53)
- Route 1
location: Big Mountain, Banff AB
difficulty: beginner
rating: ★★★★★ (20) ↖ click on a trail to bring up map + AR view
- Route 12
location: Calgary Climbing Center, Calgary AB
difficulty: intermediate
rating: ★★★★★ (103)

Recommended for you...

- Very Fun Route
location: 123 Climbing, Calgary AB
difficulty: master
rating: ★★★★★ (3)
- Super Fun Route
location: 123 Climbing, Calgary AB
difficulty: intermediate
rating: ★★★★★ (7) ✓ can keep scrolling down

+ ♥ 🏡 ✖ 🔍

ADD ROUTE FAVOURITES EXPLORE HISTORY SEARCH

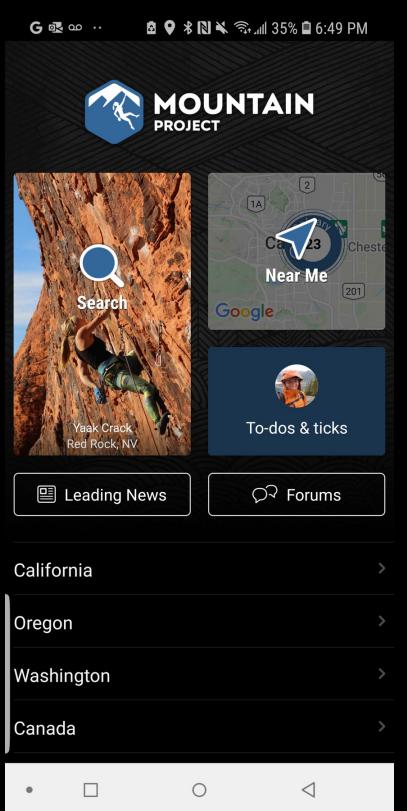


COMPETITIVE PRODUCT SURVEY

The final research method who chose was a competitive product survey. We examined the two main tools climbers typically use to locate routes in the field: paper guidebooks, and mobile applications. This was an important method to choose, because it helped us get a better sense of what the target user would already be familiar with, and likely expect in a new product.

After examining four guidebooks, we found that they all contained pictures of the rock faces with lines up them showing the routes (top left). Some of the guidebooks also contained drawings of the routes with additional information about them, or written descriptions of the route. The routes were also always listed in order from left to right. Some of the guidebooks also had routes color coded by difficulty (Appendix C).

When examining the mobile application (The Mountain Project, bottom left), we noticed that routes were not plotted on an image of rock wall, and that they were not listed in the order they appeared on the wall. The mobile application did however have features that were lacking from the books, such as the ability to search for specific routes/areas, add to a todo list, tick a climb and rate a climb (Appendix D).



METHOD REFLECTION

Overall our chosen methods worked well. Our surveys of users and of competing products both identified that there is a real need for such an application; physical guidebooks are still widely used, as existing applications do not have all the information contained in a book. The surveys combined with our paper prototypes allowed us to discover new tasks that should be implemented in our final product. The survey also was efficient and allowed us to collect a lot more information than user interviews would have, while also keeping us safe during the spread of COVID-19.

These methods were not completely without issues, however. We would have liked to collect outside opinions as part of our Competing Products Survey, however current pandemic restrictions made that unadvisable. Our user survey also found that some respondents didn't take the survey seriously. There were a few responses that contained non sensical answers, or answers that were aiming to make us find humor in them rather than be constructive feedback. This meant we had to clean the data. Since the purpose of the survey was quick and efficient data collection, it did hinder this process a bit. If we use surveys again in the future, a method for filtering the results should be employed, such as questions containing disqualifying joke answers. Overall we believe our choice of methods helped us in further understanding our market, as well as refine what our UI will look like. However, there are clearly some improvements that would have made this process even more effective.





USER TASKS

Must Include

- Users should be able to view selected climbing routes in AR mode. This mode will show them the path(s) they will be taking when climbing and will highlight this path against the climbing wall. This is the part of the application that is solving the biggest pain point for consumers.
- Users should be able to search and filter routes by grade (difficulty), name, location, etc. This will allow the user to find the specific routes that they're looking for, as well as show them all routes that match their search filters. This allows the application to contain the functionality that other products such as guidebooks contain, but also providing it to users easily right at their fingertips, as well as through a much more portable medium.
- Certain users should be able to add new routes to the system by mapping out the route in the AR app. The user will be able to enter a name, difficulty, location, pictures, and any other relevant information for the route. This is key because the user base will grow the data within the application and allow it to instantly be used around the world.

Important

- Users should be able to explore and view recommended routes for them. These recommendations will help the user find new routes that they may be interested in. This will allow climbers to find climbs they otherwise may not have.
- Users should be able to favorite routes and view these routes. This way, the user will be able to keep track of the routes they enjoy and find them with ease in the future. These favorites can also be viewed by other users.
- Users should be able to view a log/history of previous routes that they have done. This climb history can also be viewed by other users. This significantly boosts the social aspect of the application.

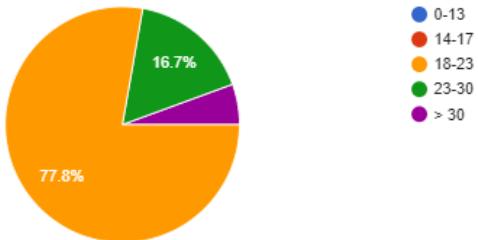
Could be Included

- Users should be able to leave reviews and ratings on routes that they have done. These reviews/ratings will be viewed by other users to better understand the route. This is functionality that would be interesting later on, but would not be necessary for a minimum viable product.
- Users should be able to view tips on routes and betas. These tips will help the user when doing the route in question and will be available to the user when they select the route.

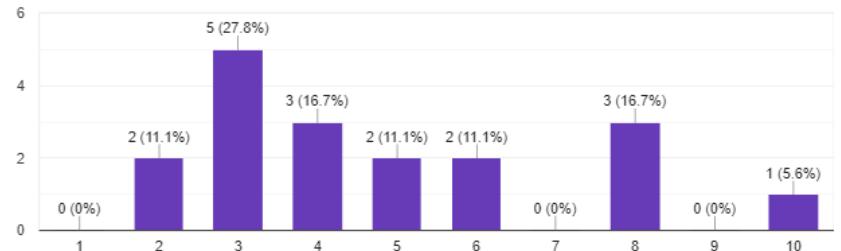
APPENDICES

Appendix A - Survey Questions and Results

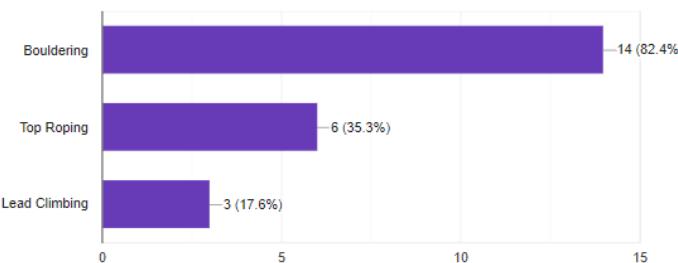
How old are you?



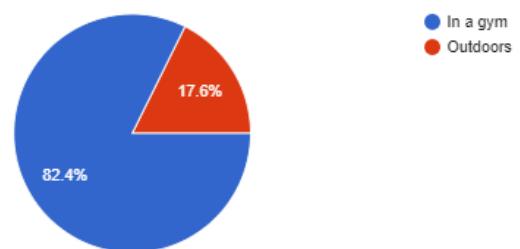
What is your experience level with regards to any discipline of rock climbing?



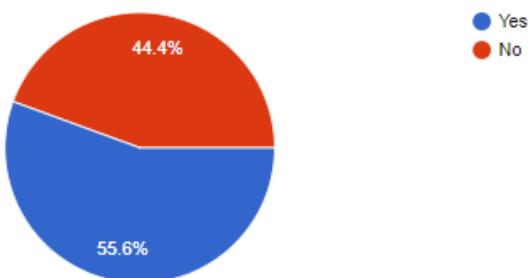
If you have climbed before, what type of climbing do you primarily do?



When you do climb, is it primarily done in a gym or outdoors?



When you have been climbing, have you ever had trouble finding a route?



If you answered yes to the previous question, how did you remedy the situation?

Some of the answers we received were:

1. Using guidebooks.
2. Try to find significant features in the rock
3. Take a step back and picture your route beforehand, then go back and try again.
4. Talking to friends at the wall and seeing how others complete it.
5. Go back down and reassess from lower vantage point

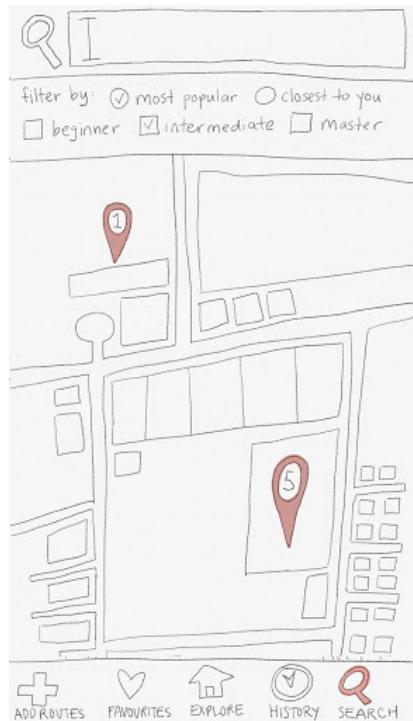
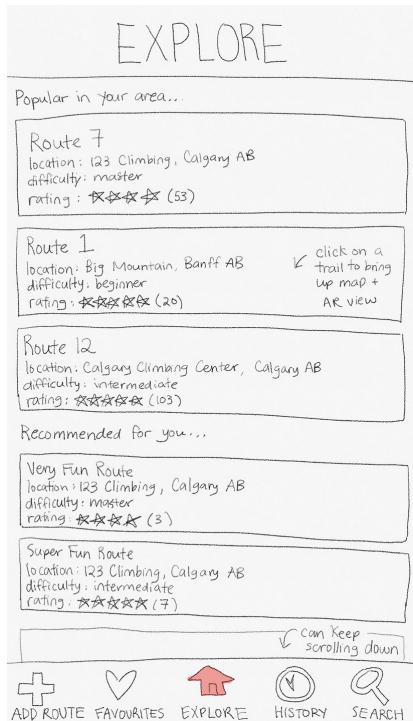
If there was a mobile climbing application that could better help you find your routes, which of the following features would you find useful?

1. 78% said they would want tips and reviews on routes
2. 70% wanted a log book of their completed climbs
3. 60% wanted to be able to view their friends climbing profiles
4. 85% of users wanted the AR functionality for finding routes
5. One user even wanted to know how tall users were

APPENDICES

Appendix B - Paper Prototypes

Explore and Search Screens



Explore and Search Screens Combined

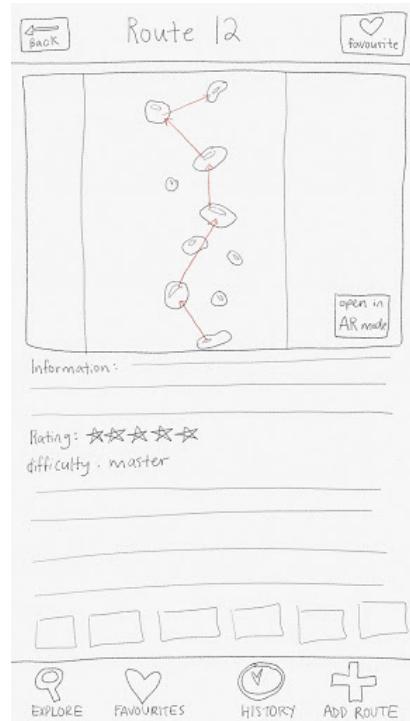


APPENDICES

Favorites, History and Add Route Screens

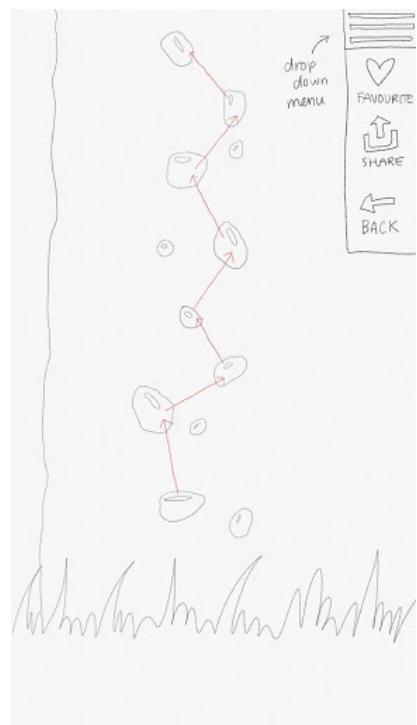
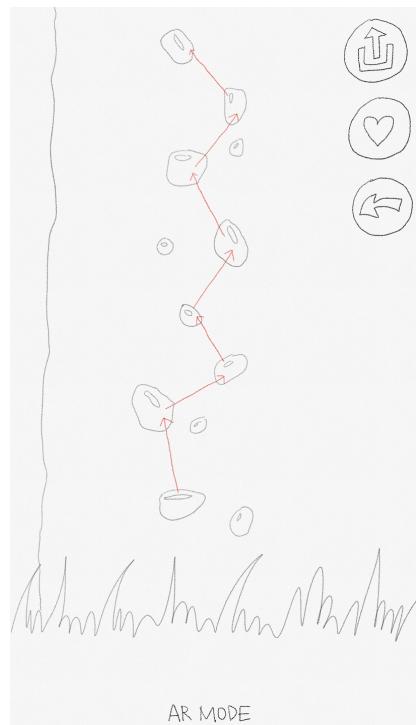
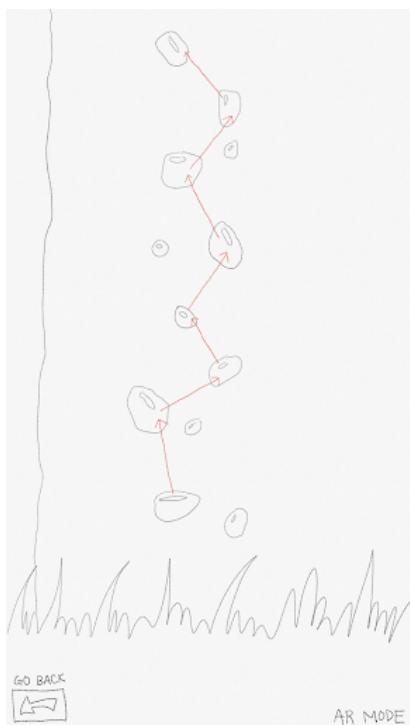


Route Selection Screen



APPENDICES

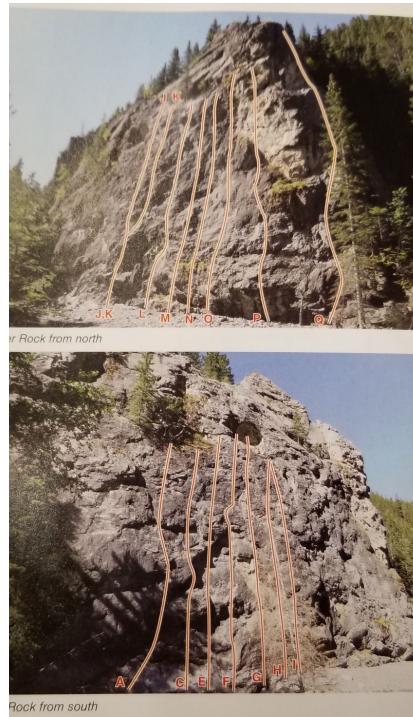
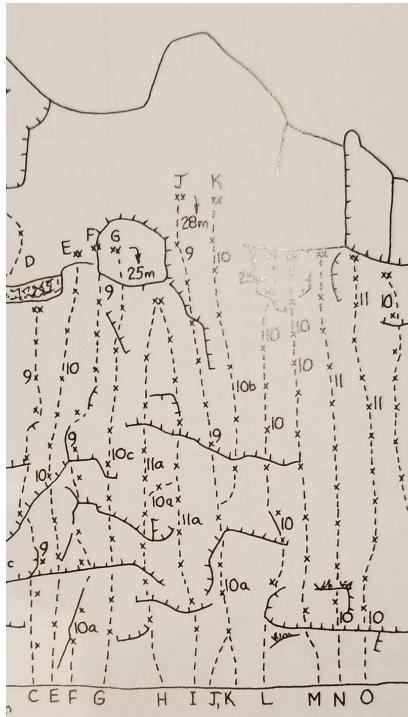
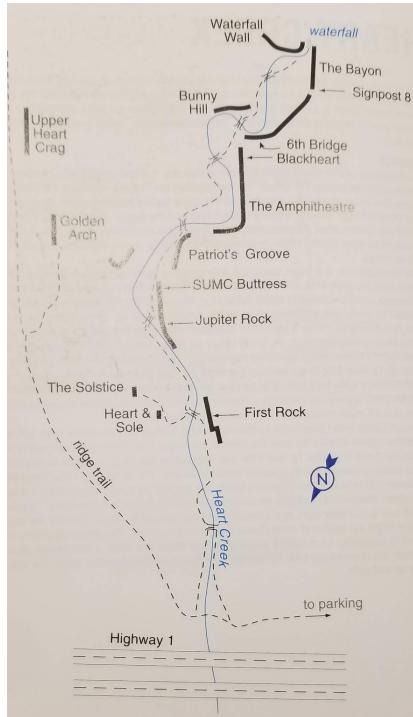
AR Mode Screen Iterations



APPENDICES

Appendix C - Competitive Product Survey Guidebooks

Guidebook Examples



Appendix D - Competitive Product Survey Mobile Application

Mobile Application Examples

Heart Creek Areas

Heart Creek [View Area >](#)

- * Heart Creek Ice
- The Bayon
- Blackheart
- Bunny Hill
- First Rock
- Jupiter Rock
- Mt. McGillivray
- Runnel Wall
- Sciatica Area
- Sixth Bridge
- SUMC Buttress

in Jupiter Rock

Zippy The
5.11a Routes Next Door
For Your Eyes
5.10b

5.10a
Sport • 1 Pitch • 92ft

★★★
2.4 from 9 votes

Begins below a short corner. Great pockets leads into a left facing corner near the top. Pull over the corner and finish above.

First Ascent: Chris Perry 1983
Submitted By: Tr89

[To-do](#) [Tick](#) [Rate](#) [Share](#)

Location

[Add Location](#)

0 Photos

Heart Creek
in Bow Valley

[All Areas](#) [Map](#) [B](#) [↑](#)

0	104	0
Trad	Sport	Top Rope

<5.6 5.8 5.10 5.12 >5.14

[Route Finder](#) [0 To-Dos](#) [0 Ticks](#)

Heart Creek is a popular sport climbing area east of Canmore with most of the climbs located next to a babbling brook. There are 6 or so developed areas and most climbs are about 30 meters with most climbs in the 5.9 - 5.11 range. There are a sprinkling of easier climbs in the 5.6 - 5.8 range and + Read More

Classics

Arterial Spurt
Ice, Alpine • 4 Pitches WI3 ★★★