



SKISENTINEL

A Project By Anda Xie



SUMMER APPATHON

OVERVIEW

- **App Name:** SkiSentinel
- **App Description:** My application aims to support skiers in terms of safety and performance. With the integration of Active Pathfinder, Speech-To-Text, and Generative Pre-Trained Transformer Technology, my app prioritizes ski safety, boosts user performance and provides valuable information with no external tactile input required - a game-changer for adventures on the slopes.
- **Track:** Youth Individual
- **Category:** Creativity, art & entertainment




THEME

- Skiing is fun, but it can be risky for inexperienced skiers and those who are directionally challenged.
- During my first-year skiing, I had to be carried off the mountain during a snowstorm by ski patrol due to taking a wrong turn onto an advanced trail.
- Skiers' limited knowledge of mountain facilities, such as restrooms, plays a role in water quality damage during Utah's ski season.
- Uninformed skiing negatively impacts skier well-being, local economies, and the environment - and it's our job to change that.



INSTRUCTIONS



Username:
Type username here!

Password:
Type Password here!

Login!

Sign Up!

Log-In / Sign up for App



Resort Temperature: N/A

Resort Conditions: N/A

Fresh Powder (in.): N/A

Wind Speed: N/A

Note: All information is for resort base!

Chat! **Start Skiing!** **Settings!**

Welcome screen with resort conditions.



INSTRUCTIONS

Resort:

Ski Patrol Phone:

Adjust settings for
skiing

Save and Exit! **Exit!**

Adjust proficiency (changes
trail recommendations) and
Ski Patrol Phone number

User: How do I ski better

Assistant: To improve your skiing skills, there are a few things you can try. First, make sure you have the right equipment that fits you well and is suitable for your skiing level. This includes properly fitted boots, skis, and poles.

Next, consider taking lessons from a certified ski instructor. They can teach you proper technique and provide valuable feedback to help you ski better. Practice is also key, so spend time on the slopes regularly to build your confidence and improve your skills.

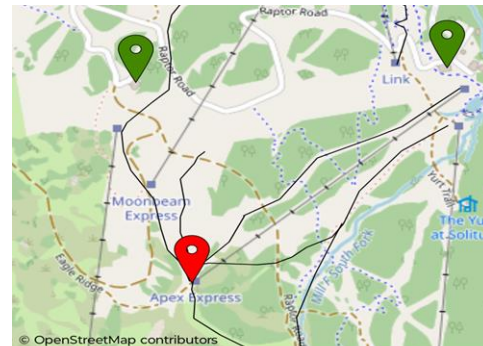
When skiing, focus on your body position. Keep your weight centered and slightly forward, with your knees slightly bent. This will help you maintain stability and control. Additionally, practice maintaining a good balance by keeping your upper body relaxed and aligned with your lower body.

Remember to start with lower difficulty slopes and gradually progress to more challenging ones as you gain confidence and skills. And most importantly, have fun! Enjoy the process of learning and exploring the beautiful world of skiing.

Input:

Input! **Back!**

Chat (Voice Input supported)
with GPT to improve skiing
technique and other
information



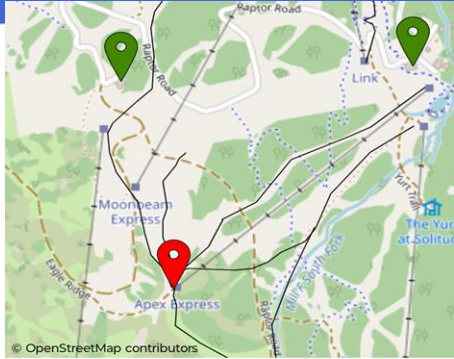
Start Skiing! **Photo!** **Back!**

EMERGENCY

Ski screen - tracks where
you are, your vitals and
offers audio feedback



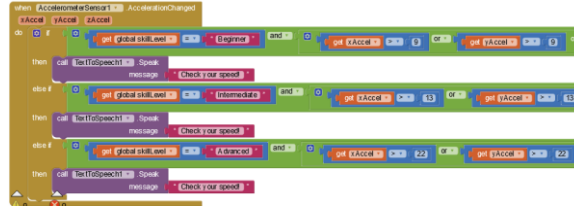
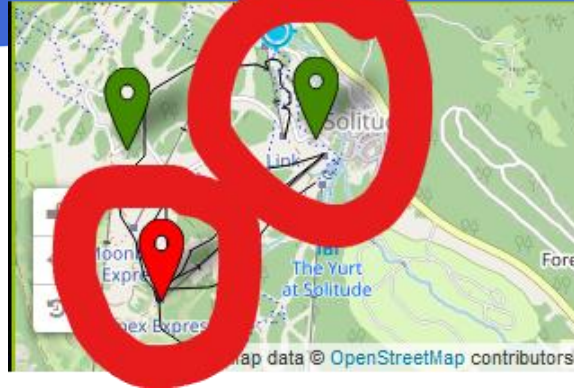
INSTRUCTIONS



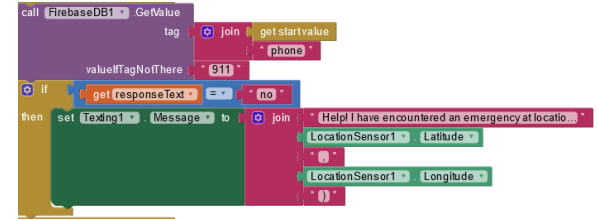
Start Skiing! Photo! Back!

EMERGENCY

Skiing screen can take a picture of yourself for automatic social media uploads.



Here, important landmarks are shown. Skier location in red and ski resort facilities, such as restrooms and restaurants in green.



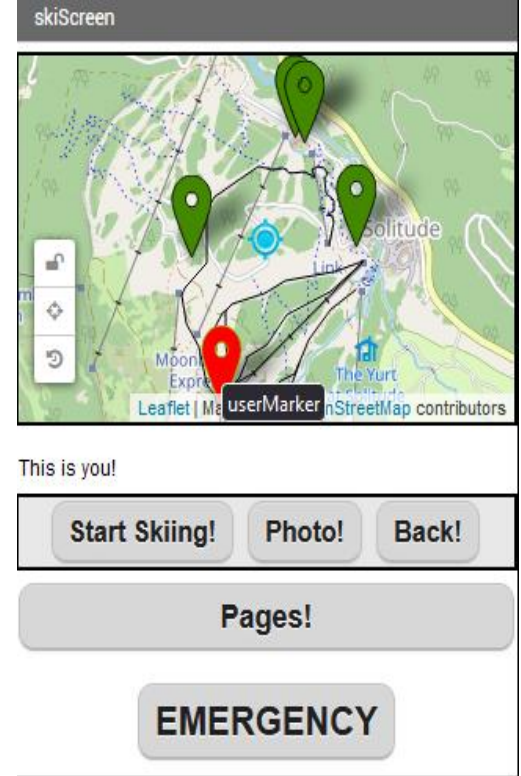
The code automatically calls ski patrol/911 when the users vitals are not normal and they verbally confirm that they are in danger.

The bottom code checks your acceleration and gives safety reminders based on your speed and skiing proficiency.



FEATURES

- Active pathfinding and route recommendation
- Resort Weather Information
- Text-to-speech/speech-to-text interface with no touch required
- Safe, secure login system that remembers chosen preferences
- Vitals detection and ski-patrol alert system with location data
- Photo-sharing system for social interaction
- Generative Pre-Trained Transformer based ski improvement recommendation
- Intuitive Pop-up Menu System



LIMITATIONS

- I had to hand-draw each ski-trail in a .geojson file to meet storage requirements. This was due to the unavailability of existing online data - making compatibility with more ski resorts a problem in the future.
- Application reliance on default phone sensors limits functionality such as ski posture correction.
- Limitations can be mitigated by drawing more ski trails, finding additional API providers and adding external haptic sensors through microcontrollers.



ACKNOWLEDGEMENTS

- Dr. Yu Meng - Dr. Meng introduced me to the MIT App Inventor. He also inspired me to pursue engineering innovations.
- Mr. Tanner Bell - Mr. Bell's experience in the snow sports industry has deepened my understanding of the field.
- Ms. Monica Hoyt – Ms. Hoyt's presentation on Utah's water source management raised my awareness of the water contamination issue during the ski season and motivated me to take action by incorporating the restroom feature into the app.



APPENDIX

Larger Design Chart and
List of Technologies [here](#)

Pop-up menu source
[here](#)

