

SeekOut

An exercise and exploration app

By Noah Freed

Motivation

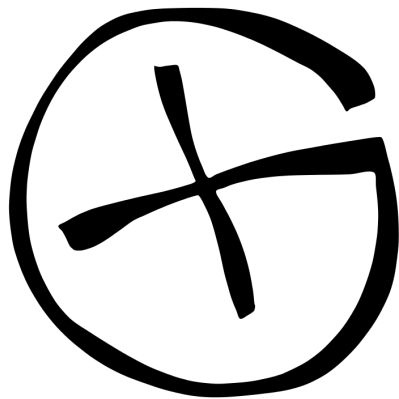
Heart disease is the leading cause of death in the US and globally [1, 2, 3]

Regular aerobic exercise improves cardiovascular health [3] and provides a variety of other benefits [4]

Studies have looked into games as an effective way to motivate people to exercise [5, 6]

Inspirations

- Gamification of exercise/exploration (Dance Dance Revolution, Pokemon Go)
- Location-hunting challenges (Legend of Zelda: Breath of the Wild memories, geocaching)
- StreetView as a game ([GeoGuessr](#))

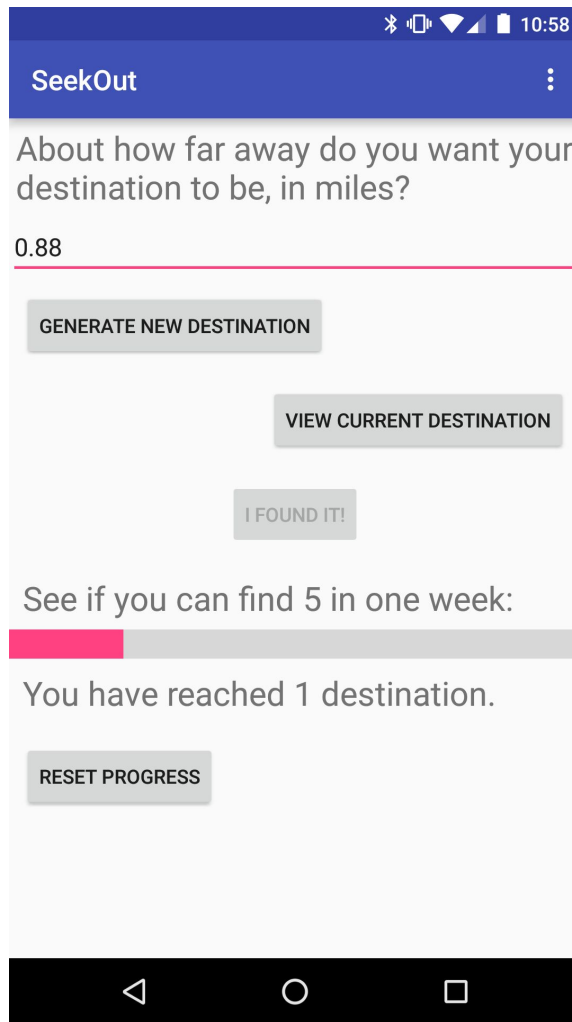


SeekOut

An Android app that generates random destinations for the user to try and find

Users can specify roughly how far away the destination should be, view a panorama of their destination, confirm when they reach it, and keep a record of their progress

The app promotes healthy behavior by encouraging regular aerobic exercise and exploration of local areas



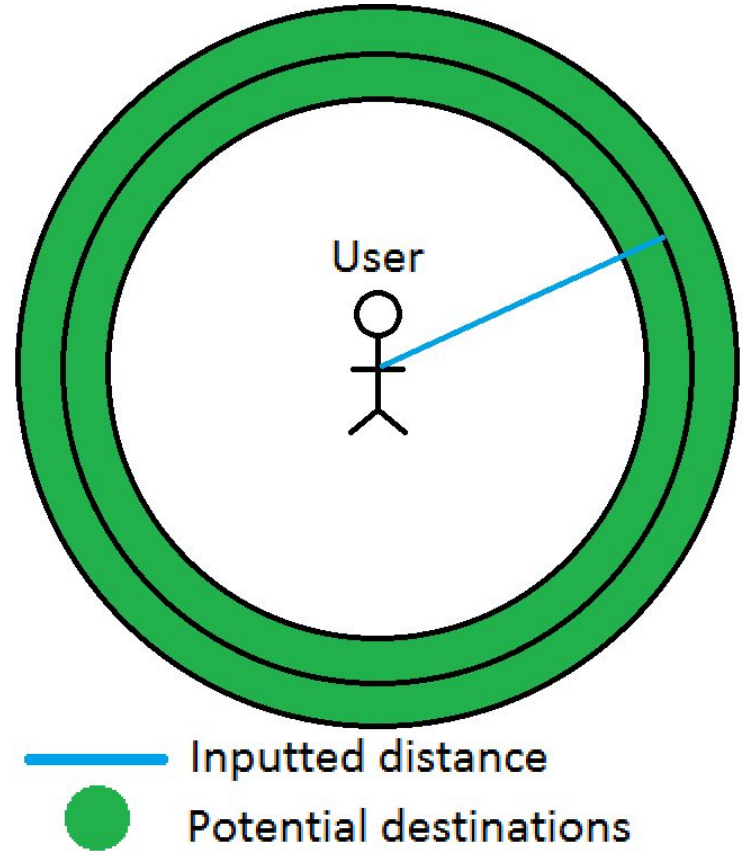
Design Decisions

- Simple, clear UI: keep the focus on the activity, not the app
- Variable distance: allows people to adjust based on their preferred mode of exercise (walking, jogging, biking), time available, and physical capability
- Default distance (0.88 miles): aims to ensure at least 30 minutes of exercise on a round trip*
- Progress bar and text: gives positive feedback to help motivation, encourages activity five times a week*

*The American Heart Association recommends at least 30 minutes of moderate-intensity aerobic exercise at least five days per week for overall cardiovascular health. [3]

Destination Generation

1. Pick a random point between $n \cdot 6/7$ and $n \cdot 8/7$ away from the user in a random direction, where n is the specified distance in miles. This variance is to produce a greater variety of potential destinations.
2. Show the closest Google Maps StreetView Panorama within 50 meters of that point.
3. If no valid panorama exists within that radius (for example, if the point is in a body of water), pick another random point.



Goal Checking

Attempt 1: Compare the user's position with the point used to generate the panorama. If the user is within a roughly 200 meter by 200 meter square area centered on the point, consider the destination found. I use a large bounding box since the actual point may be in an inaccessible location.

Unreliable in testing, possibly due to errors in the area calculation.



Goal Checking

Current Approach: Check if the user is within 100 meters on the point chosen for the destination. Has worked in limited testing.

Limitations

Goal checking has been unreliable in testing

Only works in areas mapped out by Google StreetView

Only available for Android

Only available in English

Distance is "as the crow flies", so it fails to account for impassable terrain

Future Work

Goal checking - either make it work reliably, or revert to an earlier version that just relied on the user to be honest about whether they reached the goal

Testing - get user feedback about the app and revise accordingly

UI improvements - make the user interface more visually appealing while still keeping it simple and easy to use

Availability - make the app available on the Google Play Store

Other languages and platforms - expand the potential user base by making a web-accessible version or by translating the app into other languages

What I Learned

How to use the Google Maps Android API, and APIs more generally

Elements of Java, Gradle, and Android Studio

Weekly aerobic exercise recommendations

Factors for promoting exercise motivation, such as integrating music, facilitating leadership for novices, and providing achievable goals

References

- [1] Leading Causes of Death. <https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm>
- [2] The top 10 causes of death. <http://www.who.int/mediacentre/factsheets/fs310/en/>
- [3] American Heart Association Recommendations for Physical Activity in Adults.
http://www.heart.org/HEARTORG/HealthyLiving/PhysicalActivity/FitnessBasics/American-Heart-Association-Recommendations-for-Physical-Activity-in-Adults_UCM_307976_Article.jsp
- [4] Exercise: 7 benefits of regular physical activity.
<http://www.mayoclinic.org/healthy-lifestyle/fitness/in-depth/exercise/art-20048389>
- [5] Yim, Jeffrey and Graham, T.C. Nicholas. 2007. Using Games to Increase Exercise Motivation. *FuturePlay 2007*, (November 15-17, 2007), 166-173. <https://pdfs.semanticscholar.org/b8fb/7f0dadf6c577140008f233cf1274aeced98e.pdf>
- [6] Tate, Deborah F. et al. 2015. High-Tech Tools for Exercise Motivation: Use and Role of Technologies Such as the Internet, Mobile Applications, Social Media, and Video Games. *Diabetes Spectrum* 28, 1 (Winter 2015), 45-54. DOI: 10.2337/diaspect.28.1.45 <https://pdfs.semanticscholar.org/2349/de0450768e20ccdf11a0c0232e9e6c46998b.pdf>