

Games that are enabled or enhanced by GPS
(and possibly other technologies)

A set of semi-organized notes.

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Motivation:

The potential use of technology for hobby and gaming, such as geocaching, has been known for quite a while. My personal motivation is to create “zombie” themed activities for multiple participants. While participating in some Hill Country Outdoors (<http://www.hillcountryoutdoors.com>) events I became aware of “Competition: GPS/ManHunt” (Jan. 30, 2011 @ Pace Bend Park) led by John Dukes (jdukes.photo@gmail.com). John and I had discussed this during a couple of previous hikes he had led. From these activities and discussions were born these notes.

Considerations & Requirements:

- Several individuals, 2-3 who should be considered leaders/referees for the participating teams. In general multiple teams are allowed (if not promoted).
- Each team (if not every 2-3 people) should have a clock, GPS, compass, a map, and a rough idea of the weather and terrain.
- Each person should have access to a cell phone or walkie talkie to be used in emergency situation. Note that in many of the parks we visit cell phone service is very spotty. Safety considerations should probably constrain participants to be 'no lone zone' (i.e. work in pairs at least).
- Every(!) individual should have water, emergency whistle or other audible device, and clothing suitable for the weather and terrain.
- Each team should have a small collection of 'icons' which are used to mark locations (which may or may not have events or ancillary tasks related to them).
- Each team (if not every 2-3 people) should have a paper notepad and something to write with.
- “Leave Nothing But Footprints” should be the cardinal rule, it is suggested that each team carry a 'dump bag' in which trash and other refuse encountered during the game can be collected for later disposal.

High Level Game Timeline:

- A specific location and date/time for the start of the game should be selected and shared as early as possible.
- A specific location and date/time for the end of the game should be selected and shared as early as possible.
- Once all the teams are on-site and ready to begin prep the location should be stored in all GPS units memory or otherwise noted. It's a good idea that visual references be noted for

- dead reckoning and compass navigation.
- Clear boundaries for the game field should be selected, shared, and verified by the leaders. They should be noted on any maps or other representations if possible.
- All the participants should proceed to a *start location* where all games will begin. It should be a clearing and have a readily identified marker (e.g. pink or red flag on a wire staff or a streamer tied to a tree. This is the *initial point* (i.e. IP) for navigation purposes.
- A time notice should be given to all participants and the end time should be reiterated.
- The leaders will then advise the participants of the particular game they are playing and teams can be selected (if they haven't already been).
- The individual teams then proceed to initiate in the particular game of the day.
- At approx. 30 minutes before the *end time* (i.e. Drop Dead Time) some notice should be given to the teams (e.g. an air horn blasted 3 times).
- Should any players be lost or excessively late the local park authorities should be notified by one of the leaders, and the other participants can begin a recovery search.

Smart Phone Applications:

- Layar (<http://www.layar.com>): An augmented reality application for smart phones that allows you to tag multimedia content to GPS coordinates. Once you reach the coordinates if you point the phone at the right location and angle the content comes up. There are already several hundred layers put together. Examples include a Pac Man clone and a chase game.
- My Tracks (<http://www.androidcentral.com/google-releases-tracks-gps-tracking-application-android>): A Google application that allows you to use the GPS in your phone to capture your location and share it with others.
- InstaMapper (<http://www.instamapper.com>): A free real-time GPS tracking application that allows the capture and sharing of GPS coordinates from a smart phone in real-time.
- Parallel Kingdom (<http://www.parallelkingdom.com>): A game which used augmented reality to over-lay the game world with the real world.
- Wardriving
(<http://www.google.com/#hl=en&sugexp=ldymIs&xhr=t&q=wardriving&cp=10&pf=p&scIent=psy&aq=0&aqi=&aql=&oq=wardriving&pbx=1&fp=f441cba8a7737ba9>): The process of finding Access Points using a vehicle and wireless scanners. This was brought into the discussion when games in the city were under discussion. An associated activity is called Warchalking (<http://en.wikipedia.org/wiki/Warchalking>) which has developed a set of symbols that are written in a particular location so others can find the resources easily.

Games:

- Tracking/Tracing: The goal is for each team to lay down a track or trace which will begin and end at the IP. Each clue will be noted by the *creating team* for comparison with the *tasked team* who should note and collect them as they proceed through the track/trace. Once all teams return to the IP after their track/trace creation they will select another teams track/trace and follow it (note that they will attempt the track/trace in reverse to the way it was created). Each track/trace should be approximately the same length, cover the same difficulty of terrain, and have approximately the same number of *way points*.
- Zombie 1: One of the participants is the live human and all others are zombies. The live human is given some head start (e.g. 5 minutes) and the end of which the zombies begin to track. When

a zombie catches the live human that period of play ends. Several periods of play are allowed with either the same or different live humans. At the hard end time whomever has the most live time is the winner.

- Capture the Flag: Each team locates a flag at some point roughly equidistant from all other teams flags. Each team then attempts to capture the others flag and return it to their home base before their own flag is captured and returned to another teams base. Which ever team returns a flag to their home base first wins.

Augmented Reality:

This is the use of technology to overlay graphics and text over an image of the users environment in real-time (<http://www.silicon.com/technology/software/2011/02/08/augmented-reality-machine-learning-and-the-cleric-39746937/print/>). Layer can be used to either provide a playfield such as a packman game laid over downtown streets or ancillary information such as details of the plants on an individual basis in a park or historical markers in a neighborhood. Other tools like *Peak.ar* allow you to couple your camera to a database of mountain peak information.

Video Capture:

A tool like *Robot View* or *Camera Advance* allows the user to capture a panorama view of their environment.

Wireless Mesh Networking:

Since communications is a core requirement for many of these games and in many places a strong and reliable infrastructure is not present, the obvious question of how to make the tools work reliably over short ranges can be made to happen. Since the late 1990s there has been a growing amount of work and resultant product for doing *Mesh Networking* that allows devices to create a large network between themselves by doing the backbone routing themselves (<http://www.google.com/#sclient=psy&hl=en&q=android+mesh+wireless+app&aq=f&aqi=&aql=&oq=&pbx=1&fp=509d93197c8251b0>). This has applications for not only games but also emergency communications and remote sensor networks (e.g. analysis of some bio-critical parameter set in a remote forest where the sensors talk to each other). Some applications for this have appeared in both commercial and open source products, and even some science fiction stories such as Vernor Vinge's *A Fire Upon the Deep* and *A Deepness in the Sky* (<http://www.google.com/#hl=en&sugexp=ldymmls&xhr=t&q=Vernor+Vinge&cp=12&pf=p&sclient=psy&aq=0&aqi=&aql=&oq=Vernor+Vinge&pbx=1&fp=509d93197c8251b0&bs=1>) exploring the intersection of this technology and nanotechnology (<http://www.google.com/#sclient=psy&hl=en&q=Vernor+Vinge+smartdust&aq=f&aqi=&aql=&oq=&pbx=1&fp=509d93197c8251b0>).

Field Guides:

Project Noah is a tool that allows the user to take photographs and identify the plants, as well as a lookup feature. It's available via the Android marketplace. Hunt Radar is a similar tool for identifying animals and networking with other hunters to share information in the field.

Metal Detection:

There are several applications in the Android marketplace (e.g. Essential Toolbox, Mataloid Field Detector, M2-Magnetic Sensor, & Magnetic Field Detection).

Network & Radio Tools:

As a consequence of simply using the wireless device it is sometimes helpful in troubleshooting problems to gain low level device and routing layer information. There are a variety of tools that can be used to check the various sensors, radios, and routing configurations on a device in real time. This can allow one to identify good (or very poor) reception areas or make changes to configuration that can compensate for local problems.