Possible Algorithm for Landmark Geolocation

1. Get current elevation from barometer
   1. Get atmospheric pressure, , from barometer
      1. Accuracy depends on sensor, ~0.5m error
      2. If in atmosphere(atm) convert to Pascal(Pa), 1atm = 101325Pa
      3. If in millibar(mb) convert to (Pa), 1mb = 100Pa
   2. Plug pressure into Pressure Equation:
      1. static pressure (Pa) = 101325Pa
      2. standard temperature (K) = 288.15K
      3. standard temperature lapse rate (K/m) = -0.0065K/m
      4. height above sea level (m)
      5. height at bottom of atmospheric layer (m)
      6. universal gas constant: 8.3144598 (J/mol/K)
      7. gravitational acceleration: 9.80665 (m/s2)
      8. molar mass of Earth’s air: 0.0289644 (kg/mol)
   3. Solve for (elevation)
      1. Assume
      2. Highest point on earth (Mount Everest) < 11000m
2. Get phone orientation
3. Get current Latitude and Longitude from GPS
4. Find landmarks in direction of phone
   1. Radius of Earth at equator: R = 6378137m
   2. Slice orientation of phone
      1. Start at d=1000m
      2. Increment by 1000 + 100n, n starting at 0
   3. Calculate change in in direction
      1. Know
   4. Apply values to current GPS/Elevation values
   5. Pull map location
      1. If current elevation lower than average land elevation, stop
   6. Search within 500m radius for landmark
   7. If found, save landmark location
   8. Else report nothing found
5. If landmark found, calculate distance between current location and landmark
   1. Use Law of Haversines, ~0.5% error
   2. Include change in elevation
6. Done
7. Currently not fit for edge cases:
   1. Looking straight up/down
   2. Standing under a cliff looking up
   3. More to come
8. TO FIX
   1. Change 4 to deal entirely in spherical coordinates