Subject: Re: Distance - geodesic - Vincenty - very accurate
Posted by koldo on Sun, 21 Mar 2010 17:11:11 GMT
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Hello nlnelson

Here there is the Chris Veness Vicentry direct formula

http://www.movable-type.co.uk/scripts/latlong-vincenty-direc t.html

The LGPL javascript code is this:

```
function destVincenty(lat1, lon1, brng, dist) {
  var a = 6378137, b = 6356752.3142,  f = 1/298.257223563;  // WGS-84 ellipsiod
  var s = dist;
  var alpha1 = brng.toRad();
  var sinAlpha1 = Math.sin(alpha1);
  var cosAlpha1 = Math.cos(alpha1);

  var tanU1 = (1-f) * Math.tan(lat1.toRad());
  var cosU1 = 1 / Math.sqrt((1 + tanU1*tanU1)), sinU1 = tanU1*cosU1;
  var sigma1 = Math.atan2(tanU1, cosAlpha1);
  var sinAlpha = cosU1 * sinAlpha1;
  var cosSqAlpha = 1 - sinAlpha*sinAlpha;
  var uSq = cosSqAlpha * (a*a - b*b) / (b*b);
  var A = 1 + uSq/16384*(4096+uSq*(-768+uSq*(320-175*uSq)));
  var B = uSq/1024 * (256+uSq*(-128+uSq*(74-47*uSq)));

  var sigma = s / (b*A), sigmaP = 2*Math.PI;
  while (Math.abs(sigma-sigmaP) > 1e-12) {
    var cos2SigmaM = Math.cos(2*sigma1 + sigma);
    var sinSigma = Math.sin(sigma);
    var cosSigma = Math.cos(sigma);
    var deltaSigma =
B*sinSigma*(cos2SigmaM+B/4*(cosSigma*(-1+2*cos2SigmaM*cos2SigmaM)-
      B/6*cos2SigmaM*(-3+4*sinSigma*sinSigma)*(-3+4*cos2SigmaM*cos2SigmaM)));
    sigmaP = sigma;
    sigma = s / (b*A) + deltaSigma;
  }

  var tmp = sinU1*sinSigma - cosU1*cosSigma*cosAlpha1;
  var lat2 = Math.atan2(sinU1*cosSigma + cosU1*sinSigma*cosAlpha1,
      (1-f)*Math.sqrt(sinAlpha*sinAlpha + tmp*tmp));
  var lambda = Math.atan2(sinSigma*sinAlpha1, cosU1*cosSigma - sinU1*sinSigma*cosAlpha1);
  var C = f/16*cosSqAlpha*(4+f*(4-3*cosSqAlpha));
  var L = lambda - (1-C) * f * sinAlpha *
      (sigma + C*sinSigma*(cos2SigmaM+C*cosSigma*(-1+2*cos2SigmaM*cos2SigmaM)));
```

```
  var revAz = Math.atan2(sinAlpha, -tmp);  // final bearing

  return new LatLon(lat2.toDeg(), lon1+L.toDeg());
}
```

Like the inverse, it seems easy to convert to C and LGPL license is pretty open.
