Postal Codes, Polygons, Perl and Poetry

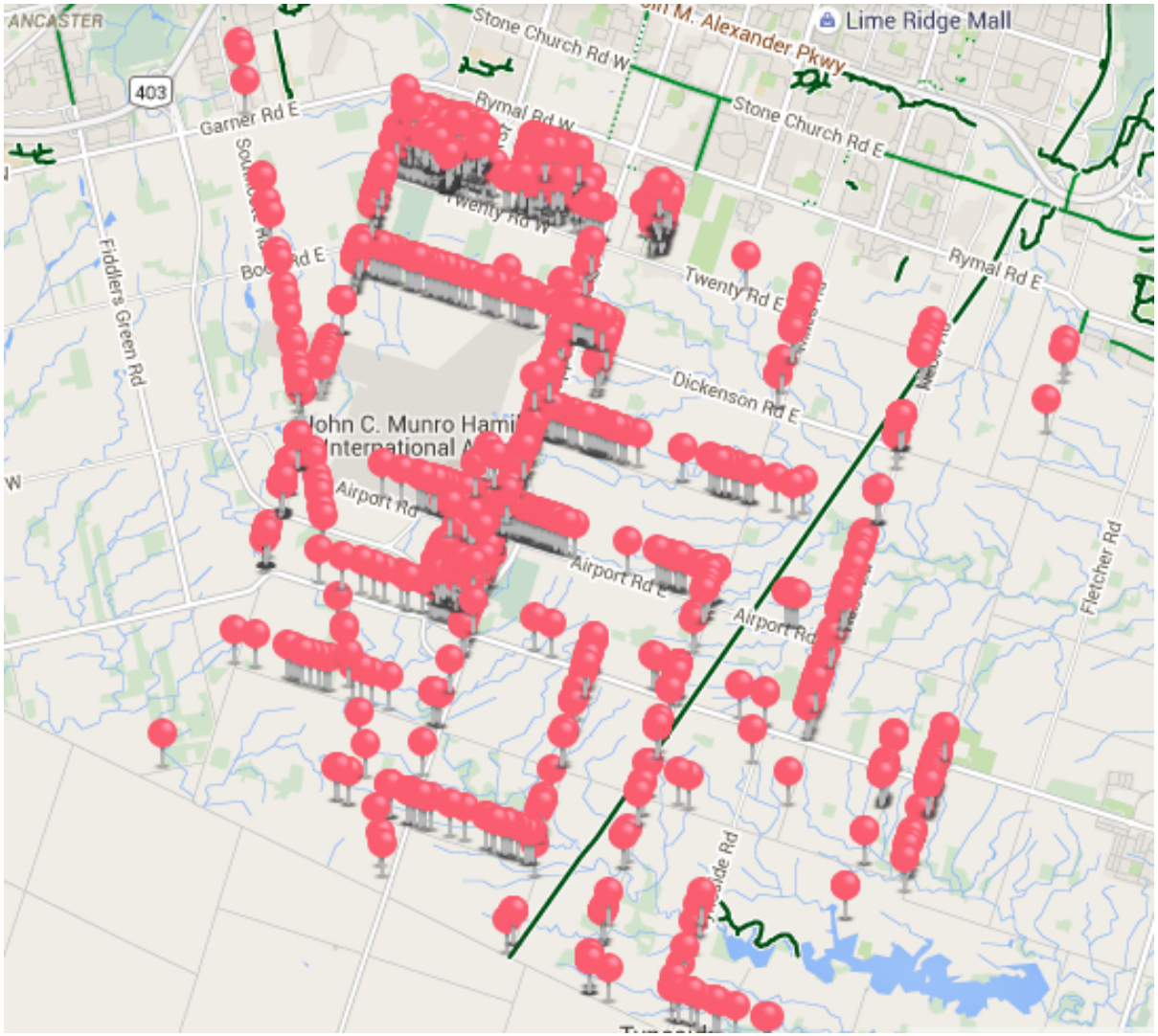
.. and finding the correct location from some text

Postal Addresses in Canada

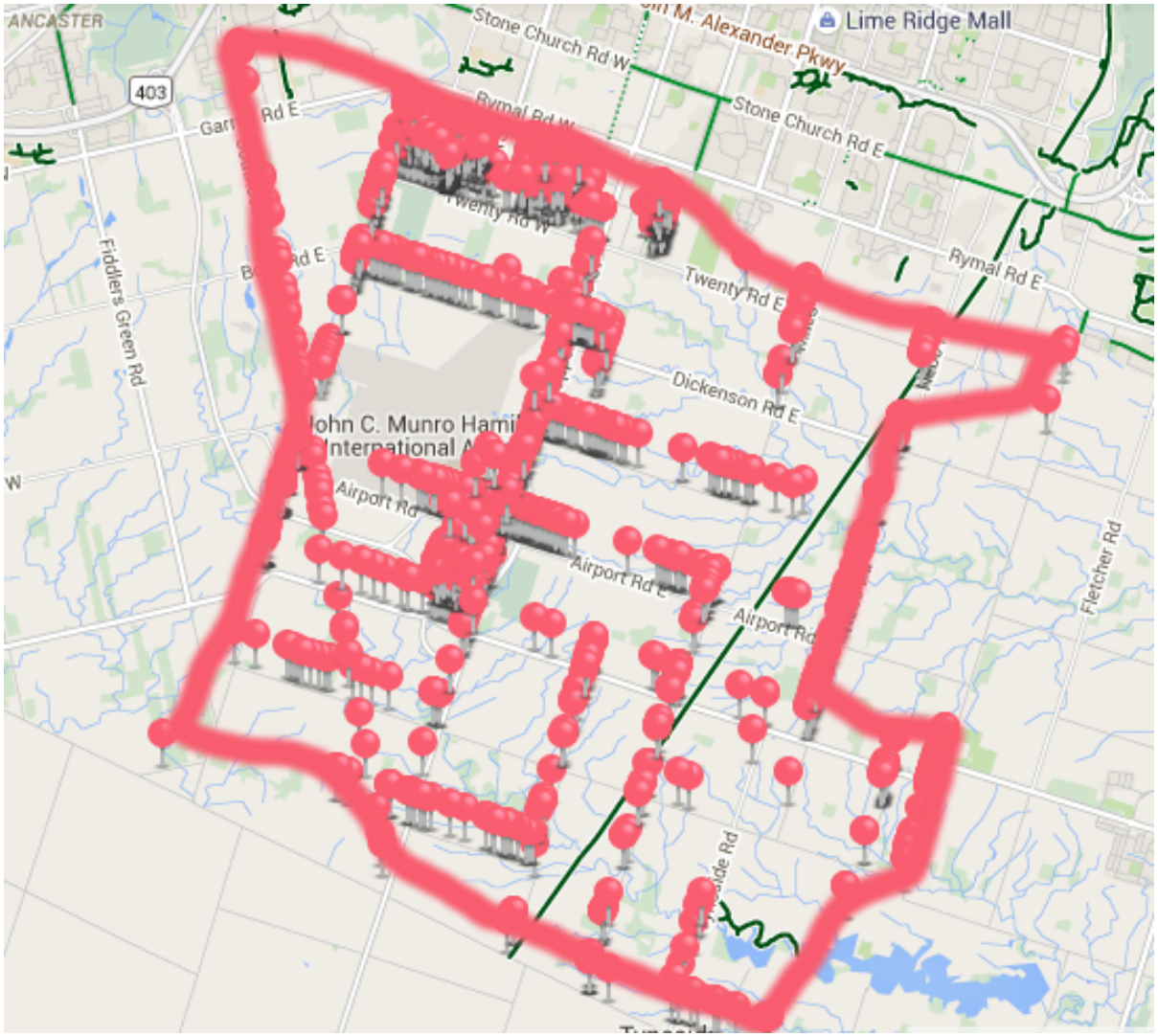
Street Number, Street Name, City, Province
Followed by:

A	N	A	N	A	N
K	2	C	1	N	5

A Canadian Postal Code Polygon



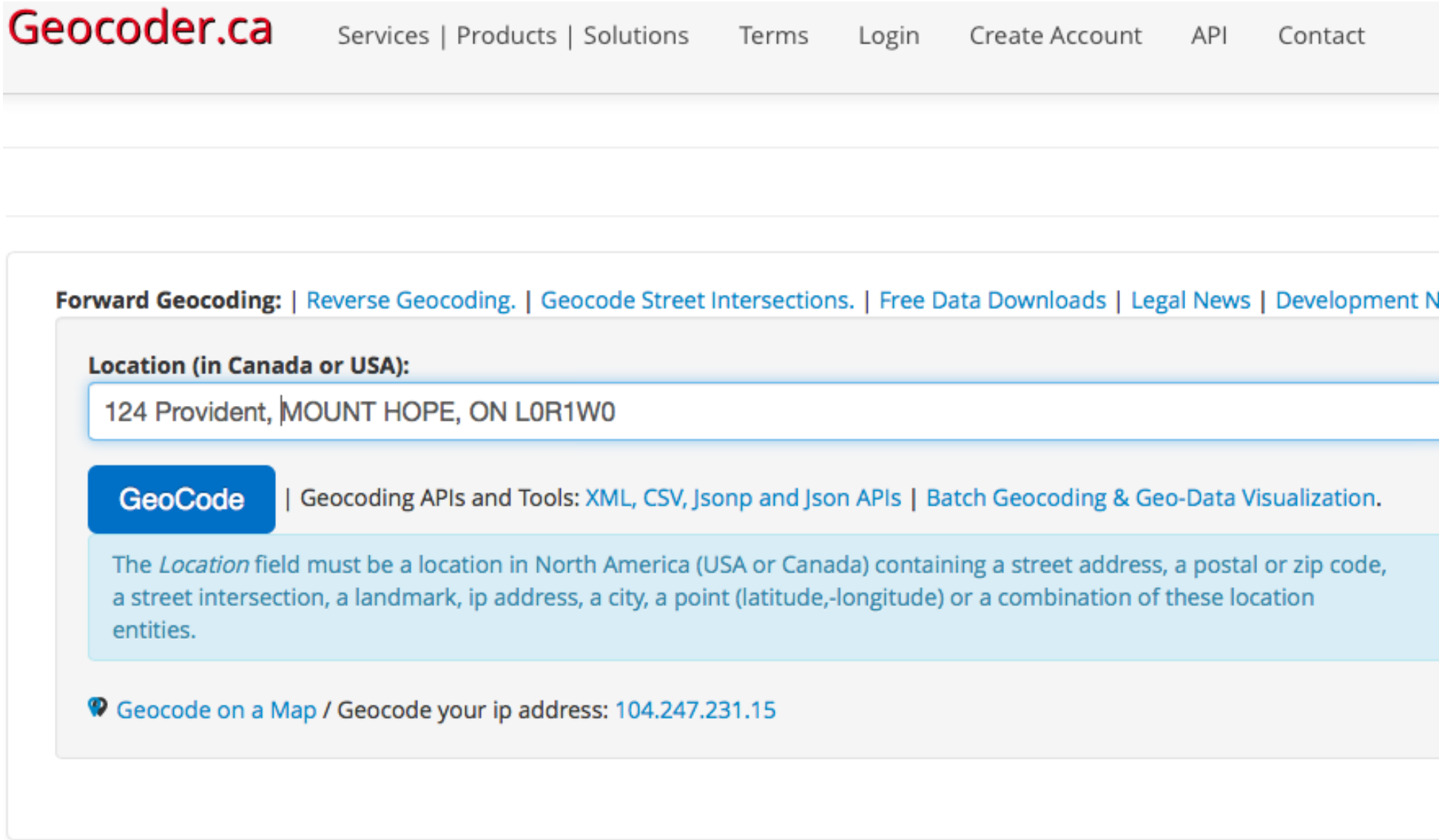
A Canadian Postal Code Polygon Approx



Wait a sec!

Where did all these points come from?

You!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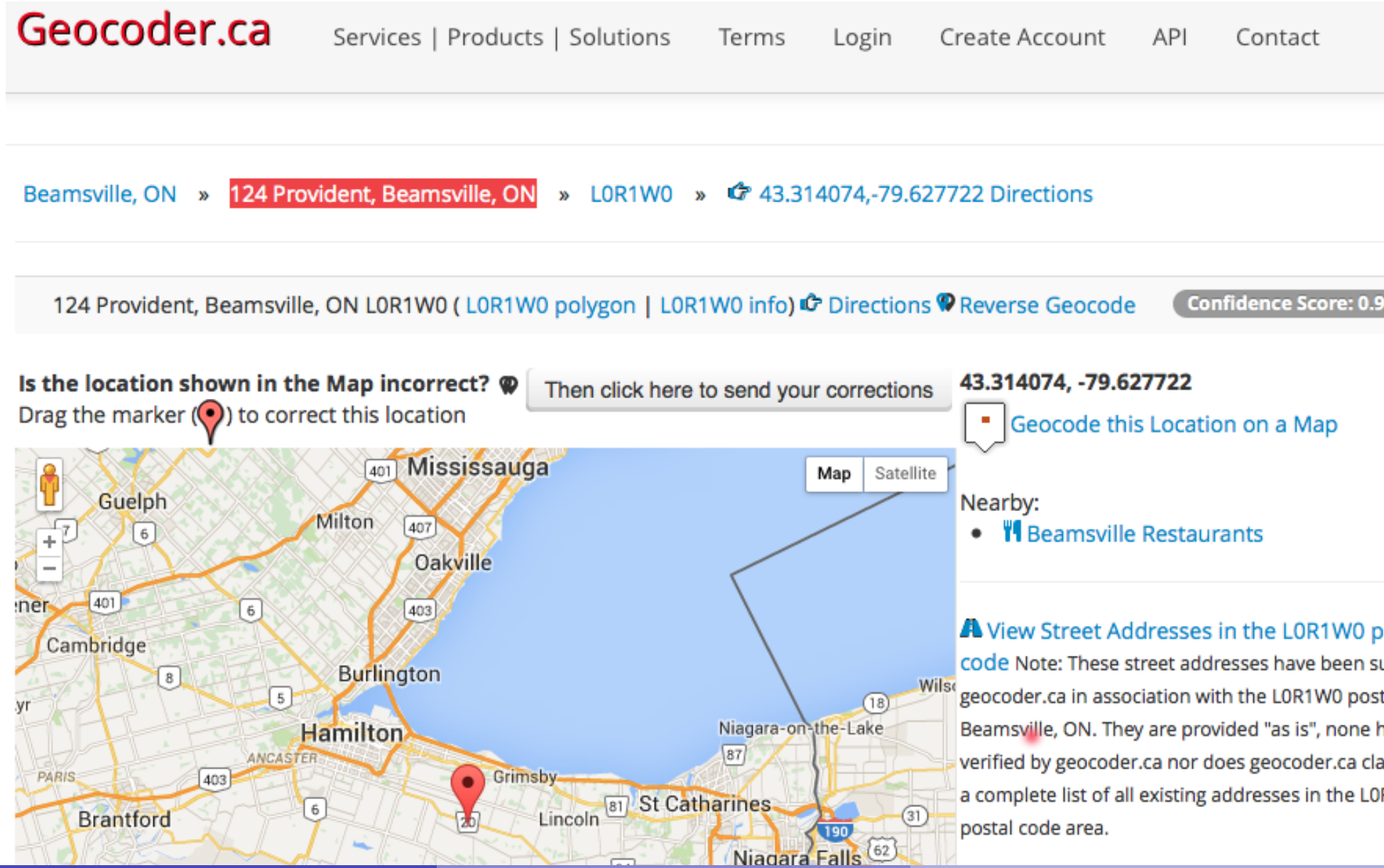
Location (in Canada or USA):
124 Provident, MOUNT HOPE, ON L0R1W0
GeoCode
| Geocoding APIs and Tools: XML, CSV, Jsonp and Json APIs | Batch Geocoding & Geo-Data Visualization.
The Location field must be a location in North America (USA or Canada) containing a street address, a postal or zip code, a street intersection, a landmark, ip address, a city, a point (latitude,-longitude) or a combination of these location entities.
Geocode on a Map / Geocode your ip address: 104.247.231.15

The Crowd!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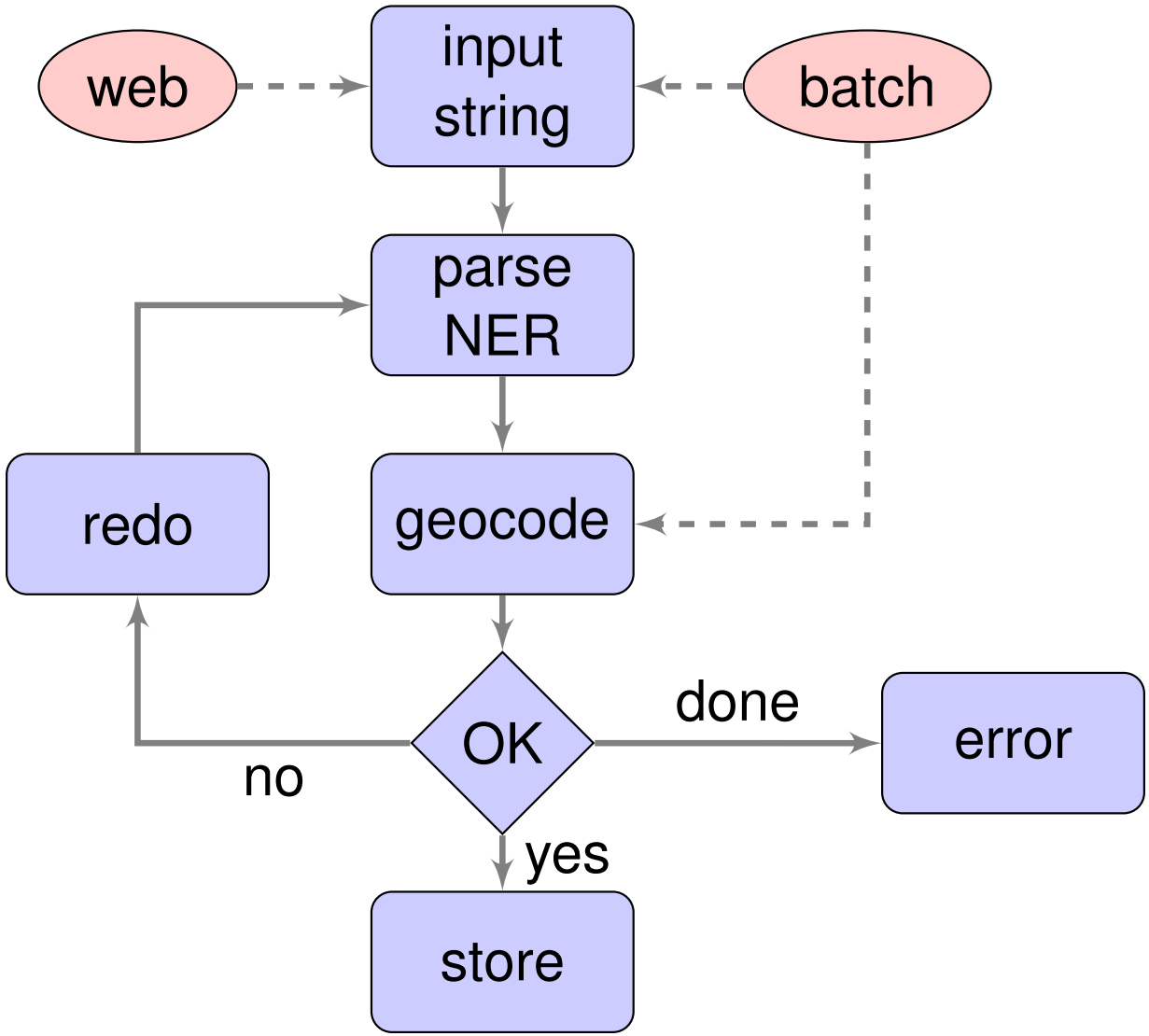
Beamsville, ON » 124 Provident, Beamsville, ON » L0R1W0 » 43.314074,-79.627722 Directions
124 Provident, Beamsville, ON L0R1W0 (L0R1W0 polygon | L0R1W0 info) Directions Reverse Geocode
Confidence Score: 0.9
Is the location shown in the Map incorrect?
Drag the marker ( ) to correct this location
Then click here to send your corrections
43.314074, -79.627722
Geocode this Location on a Map
Nearby:
Beamsville Restaurants
View Street Addresses in the L0R1W0 p
code Note: These street addresses have been su
geocoder.ca in association with the L0R1W0 post
Beamsville, ON. They are provided "as is", none h
verified by geocoder.ca nor does geocoder.ca cla
a complete list of all existing addresses in the L0
postal code area.
Map
Satellite
Mississauga
Guelph
Milton
Oakville
Cambridge
Burlington
Hamilton
Grimsby
St Catharines
Niagara-on-the-Lake
Brantford
Lincoln
Niagara Falls

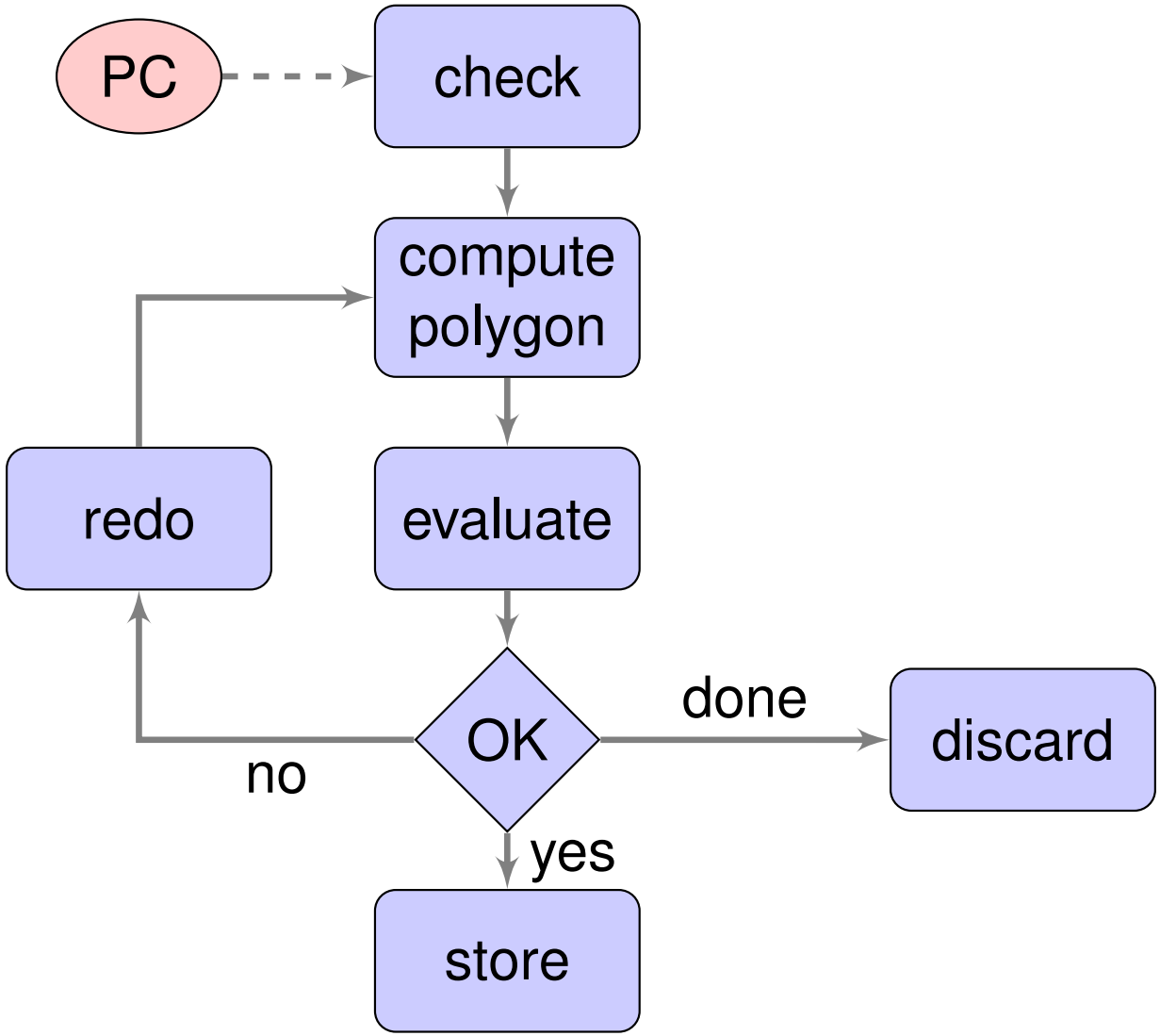
The Process. Step 1: Geocoding



The Crowd

```
Main Assumption: The Majority is right!
Safe bet: A certain minority is wrong!
```

The Process. Step 2: Analyzing



Various assumptions

'Similar' postal codes are located close together. (K2C 1N5, K2C 1N4, etc...). If further than a certain "distance", discard.

```
K2C1N5
K2C1N
K2C1
K2C
```

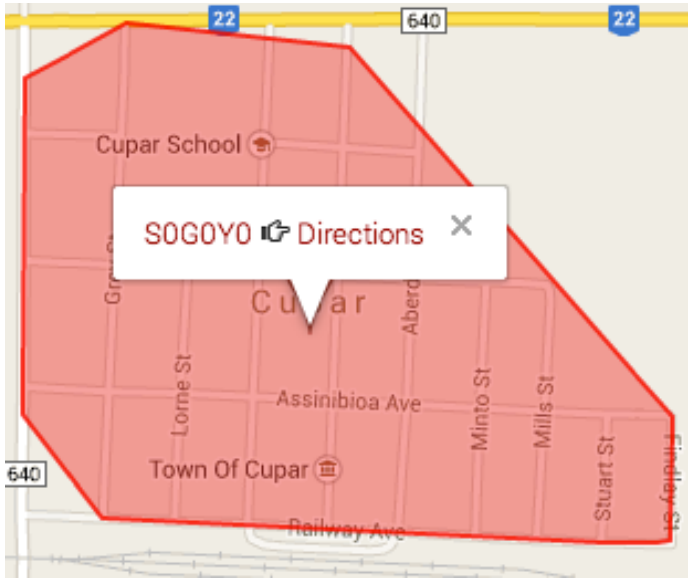
Need to check if a new postal code is processed in the system.

Limitations

1. No way to tell if a certain postal code is no longer valid.
2. How accurate can crowdsourcing be?

A sample postal code polygon

A new postal code can either expand a given polygon, create a new one (or rather a point), or leave the polygon unchanged. A postal code polygon must not intersect with another, so if a new entry attempts to do that, discard.



Either an alpha shape (if enough points) or simple convex polygon

Numbers on Accuracy (courtesy of Denis Carriere)

```
COUNT (Geocodes)
======
Osm: 29141
Esri: 40382
Mapquest: 39413
Bing: 40934
Google: 39583
Geolytica: 40158
Nokia: 40938

(out of about   41,999 verified locations)
```

http://datahub.io/organization/addxy

Geocoding Test Methodology

1. Get data from verified sources (municipality data manually geocoded rooftop: http://open.canada.ca/en/maps/open-data-canada
2. Geocode the data on each provider and compare the result to the verified result

Numbers on Accuracy (courtesy of Denis Carriere)

```
AVERAGE ERROR
=======
Osm: 347m
Esri: 39m
Mapquest: 76m
Bing: 80m
Google: 87m
Geolytica: 187m
Nokia: 77m
```

http://datahub.io/organization/addxy

Numbers on Accuracy (courtesy of Denis Carriere)

```
CRITICAL ERROR (+1km)
=====================
[5.04%] Osm: 1469
[0.06%] Esri: 28
[0.26%] Mapquest: 106
[0.22%] Bing: 93
[0.70%] Google: 278
[2.08%] Geolytica: 836
[0.22%] Nokia: 92
```

http://datahub.io/organization/addxy

Numbers on Accuracy

```
MARGINAL ERROR (+250m)
======================
[6.26%] Osm: 1826
[1.27%] Esri: 515
[2.99%] Mapquest: 1180
[1.13%] Bing: 466
[3.36%] Google: 1330
[7.76%] Geolytica: 3117
[1.12%] Nokia: 461
```

http://datahub.io/organization/addxy

Is the crowdsourced postal code db accurate enough?

Good Question.

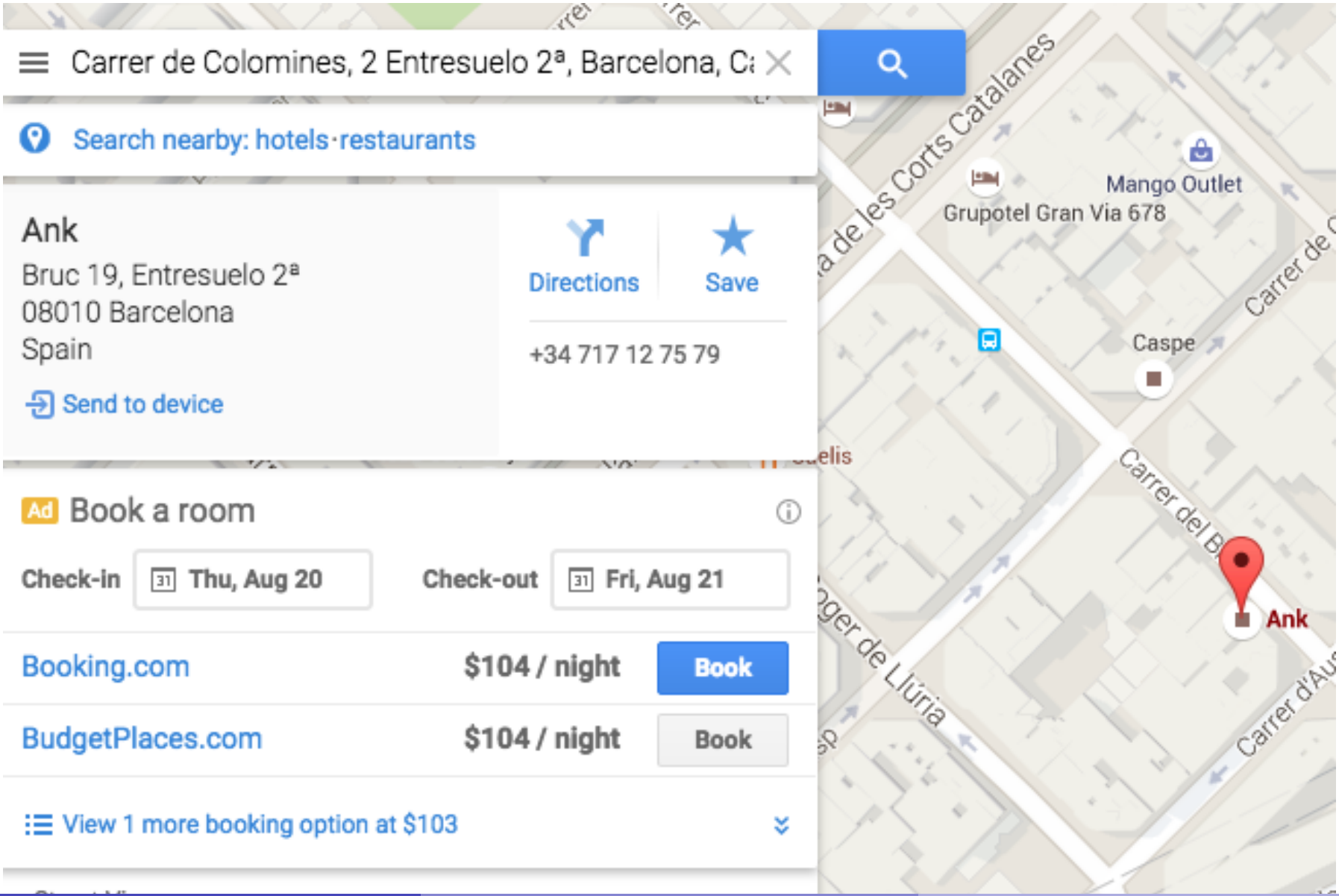
About Me and Perl

1. I do not like to change the world, only what I do not like.
2. I like Perl.
3. I am not a very good perl programmer
4. But I still can use it to solve complex problems
0. That is why I like Perl.

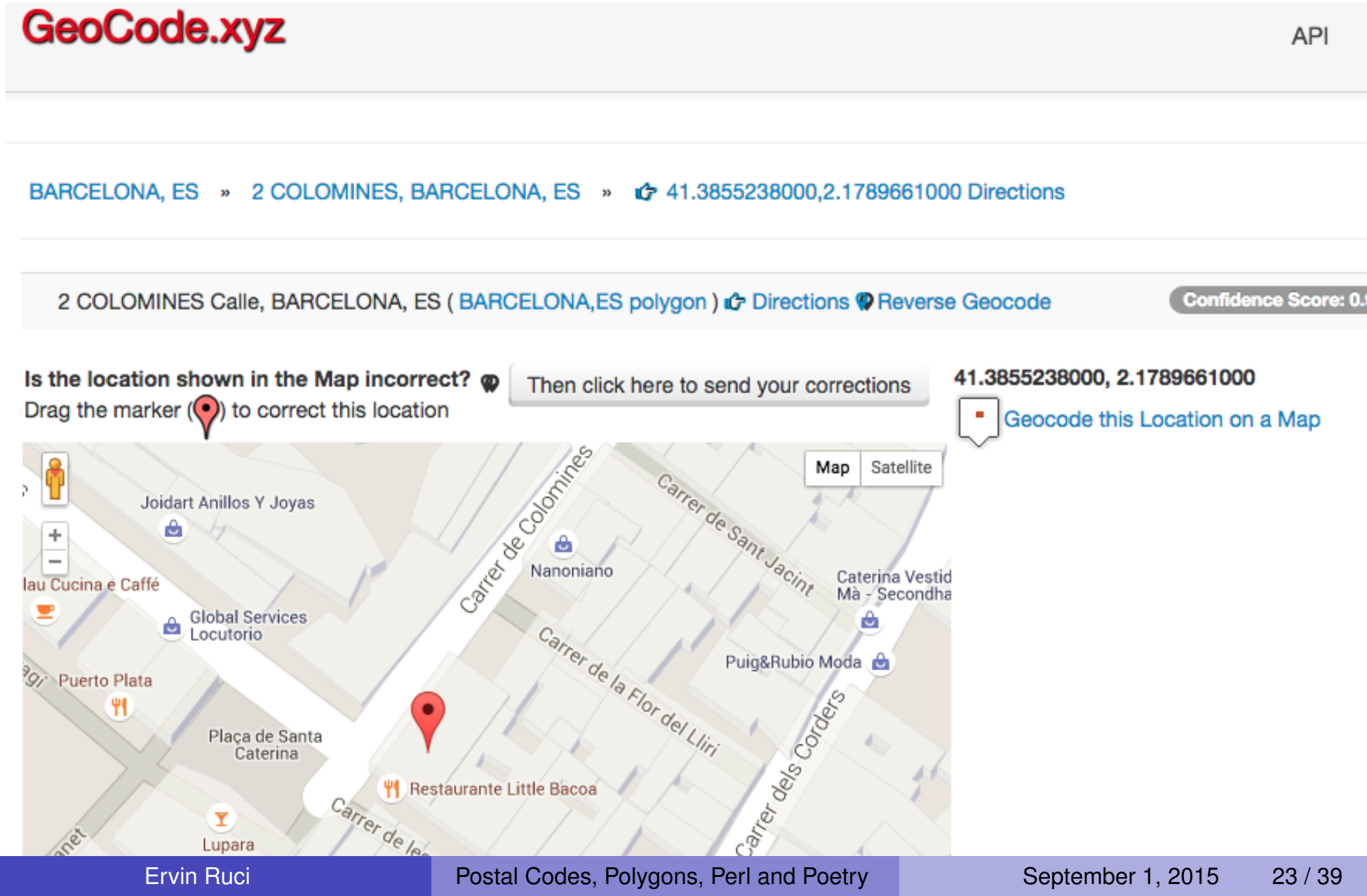
Why go into all this trouble?

1. I do not like getting lost.
2. I visited Barcelona last month.
3. I stayed at two Airbnb's
4. Both times I was sent to the wrong location by Google Maps
0. Is there more than one way to do it?

Carrer de Colomines, 2 Entresuelo 200AA, Barcelona, Catalunya 08003, Spain



http://Geocode.xyz - A geocoder for Spain



Data sources

Spanish Data License


```
{
    "coverage": {
        "ISO 3166": {"alpha2": "ES", "country": "Spain
        "country": "es"
    },
    "data": "http://data.openaddresses.io/cache/es-258
    "website": "http://blog-idee.blogspot.com.es/2014/
    "year": "2014",
    "license": "http://www.catastro.minhap.es/ayuda/le
    "note": "Spain's cadastral data is available as a
    shapefile secured by an X.509 certificate
    available to Spanish citizens. However,
    a GML release has been made available.
    Consisting of 1700+ files, it has been processed
    using scripts available at
    http://github.com/openaddresses/openaddresses/scri
    "type": "http",
```

Geocode.xyz Coverage and Accuracy

95% and 87% (Using foursquare verified locations as test cases)

Geocode.xyz To Do

Fuzzy match, missing regions, local language support, more polygons, intersections, and lots more

Geocode.xyz License

Creative Commons Attribution 2.5 Spain License.

Back to geocoder.ca and On to legal questions

Copyright Infringement...

The Gist of the Cease and Desist I received (2011)

While everyone has an implied license to use Postal Code(OM) data for the purposes of addressing their own mail to be delivered by Canada Post, any other use is an infringement

Yours truly,

http://geocoder.ca/CP_Cease_and_Desist.pdf

Status

Ongoing... (Federal Court of Canada)
Updated in 2013 to include a trademark infringement suit over the use of the words *Postal Code*(OM).

Infringing or not - Use at your own risk!

Creative Commons Attribution 2.5 Canada License.

Let us face it

Without Copyright Infringement, I would not be here today!

This is what those 200 lines of perl code do

The Algorithm:

1. Compute Polygon
2. Check if it intersects with another polygon.
3. Determine the point whose removal causes the area of intersection to be minimum. (If this point does not exist, that means one polygon is inside another, e.g., city, suburb)
4. Remove that point
0. Repeat.

(I should be able to do it with less lines of Perl, but like I said before, I am a lousy perl programmer.)

Source Code / Data

Source code: http://geocode.xyz/sources
Source Data: http://geocoder.ca/?freedata=1
(Postal Codes, IP Addresses, City names etc..)

In closing ...

About a mythical beast, which is quite impressive, to say the least!

Perl + Postal = Perstal = Poetry

Law abiding people have been using postal codes not just for the purposes of addressing their own mail ..
For example .. A poem .. Copied, Written by a perl script ..

```
T0E P0R8L3 C0W

1H1A0A N3V3R1 S3E P0R8L3 R0C0W0

A2N1N0 N0T T1N0K0 0N3 E6X1S1

B0T 1F1 T0E Y0U B3T3R3 L0K0T0

N0T T0 M1S T0K F0R P0R8L3 S3E3E3
```

(Algorithm: Map hash with 'postal code/postal code fragments' $\rightarrow$ 'metaphone key'; match each word in text to closest hash key...)

The original

(A short silly poem based on a short nonsense poem by G. Burgess.)

```
The Purple Cow.

I have never seen a purple cow

and I don't think that one exists,

but, if it does you better watch owt!

not to mistake it for a purple sheep.
```

The original's original

(A short nonsense poem by G. Burgess.)

```
The Purple Cow.

I never saw a Purple Cow,

I never hope to see one;

But I can tell you, anyhow,

I'd rather see than be one.
```

https://en.wikipedia.org/wiki/Purple_Cow

That's all the grass I had for today. Questions?