



Find best tracks for your outdoor trainings!

Introduction

Problem

New to an area and still want to go mountain biking or hiking? How do you find out where to go?

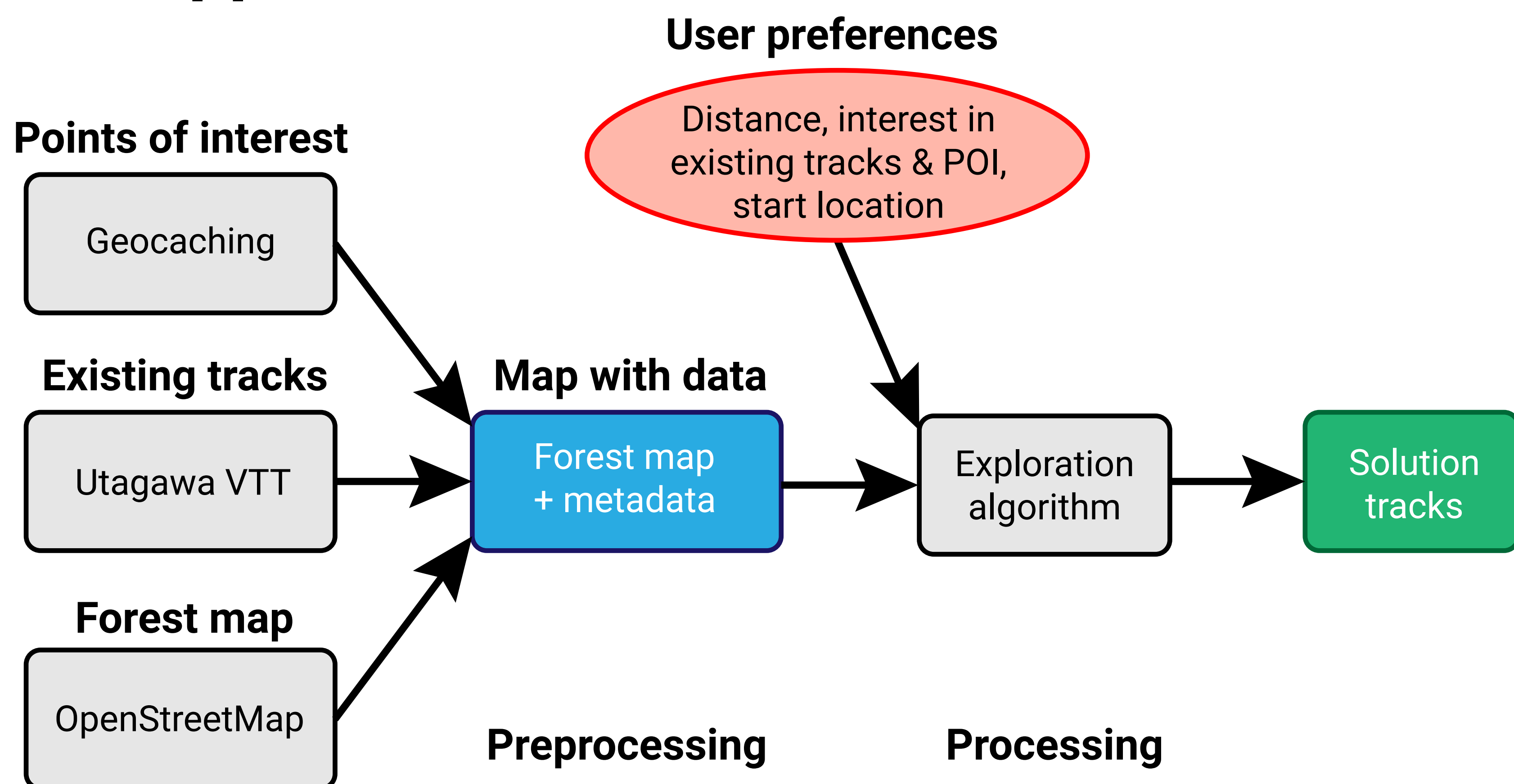
Solutions exist:

- Try to find a trail with Google Maps,
- Search for points of interest online and try to reach them with Maps

But ... these solutions aren't viable:

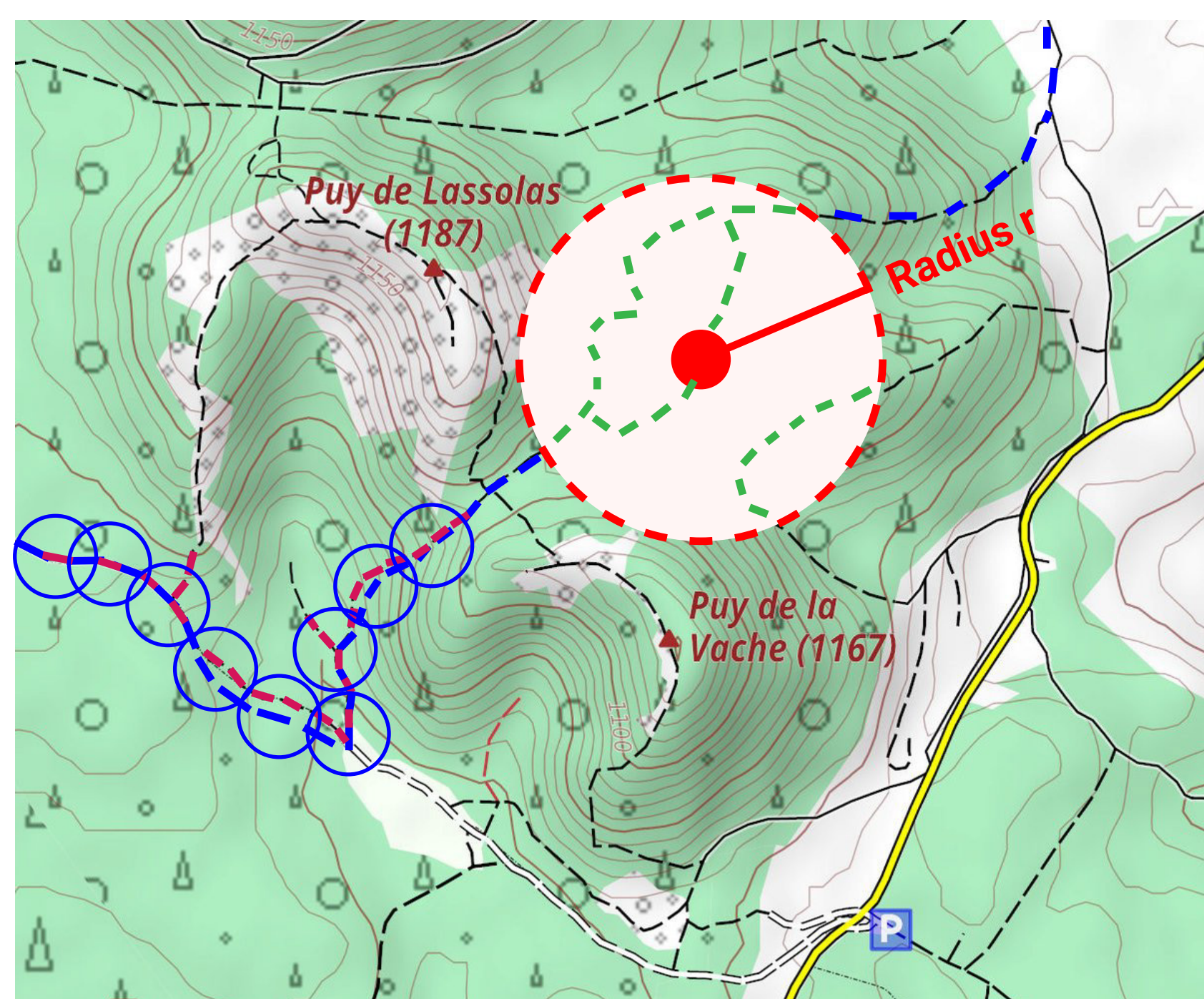
- Google Maps tries to find the shortest way between two points, not the most interesting one,
- If you want to reach a POI, you cannot be sure the way to it is interesting too

Our approach



Our data & preprocessing method

Geocaching database **250,000 POI** + Utagawa VTT database **11,000 mountain bike tracks**



POI preprocessing

- POI n°X
- Limit of neighbourhood $r=1\text{km}$
- Interesting roads Increase POIWeight

Tracks preprocessing

- Track n°Y
- Track approximations $r=25\text{m}$
- Interesting roads Increase TrackWeight

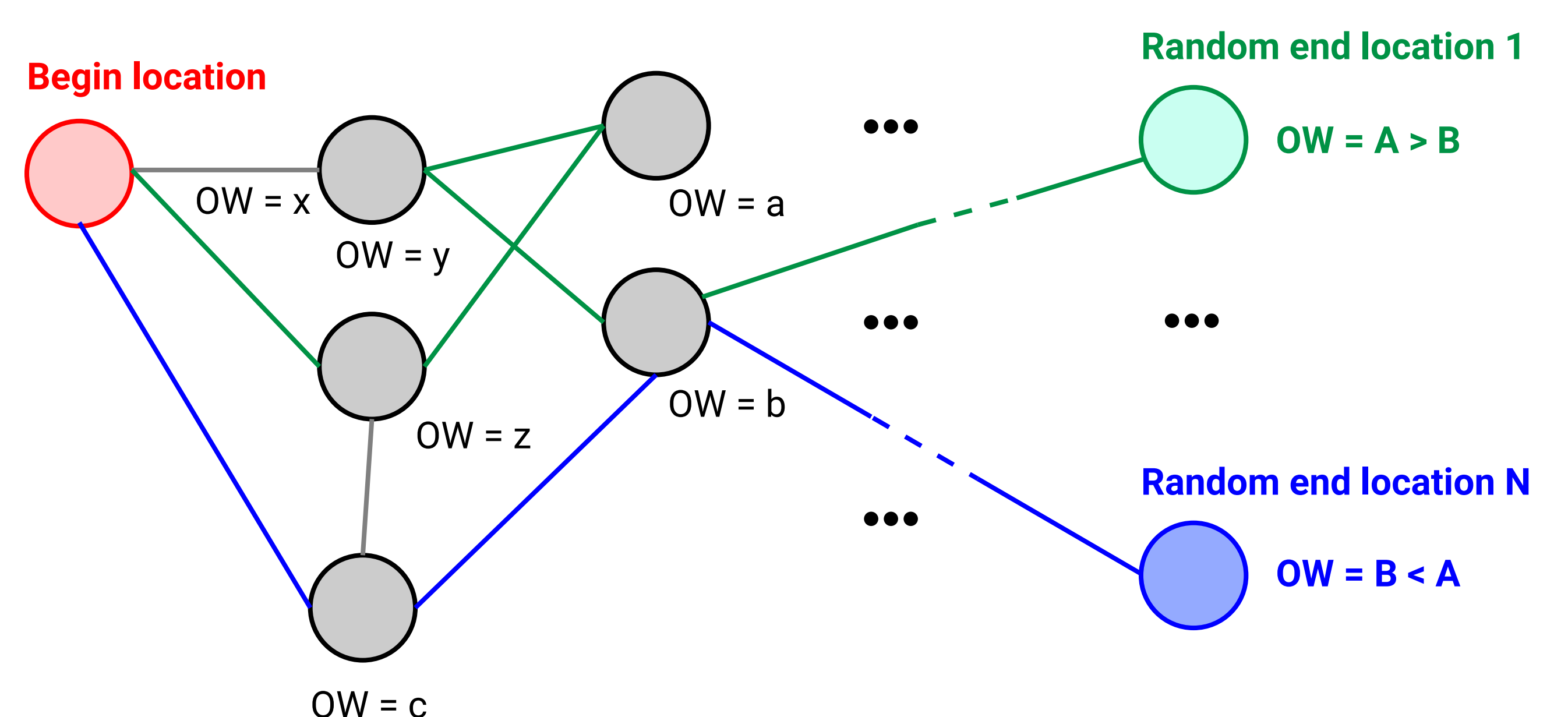
→ GeoJson map with POIWeight & TrackWeight metadata

What's new?

Our solution takes advantage of existing information on the internet: biking/hiking trails and POI. According to user preferences, our algorithm searches for the best tracks around and displays them on a web interface. These tracks are optimized to fit the user's desires.

Processing algorithm

Overall weight = $OW = \text{POI weight} + \text{Track weight}$



Experiments & results

Back end experimentation

	Ave. poi weight per point	Ave. track weight per point
Random point	< 0.001	0.055
Google Maps (begin location & random end)	< 0.001	0.062
Utagawa (not correlated with begin location)	0.009	1.24
Algorithm (begin location & random end)	0.012	0.87

The algorithm gives tracks with higher weight than a simple Google Maps one. Moreover it's more useful that just using random directions too. Utagawa tracks are sometimes better, but they cannot be used because not related to right begin location and track distance.

We generate trails between our start and N random end points. We then choose the trail with the largest OW value. In this case, the best ending point is random end location 1.

Front end experimentation

UX iteration	1	2	3
Broggi	5.0	7.5	8.0
Palo	7.0	8.0	10.0
Mueller	4.5	6.5	9.0
Zheng	5.0	7.0	8.5
Ave.	5.34	7.25	8.88

Personal evaluation (base 10)

For each iteration, every member gave a mark for the UX in regards to simplicity, efficiency, and quality. New versions were designed until the average mark reached a fixed threshold of 8/10.