

Construction of geo-commons by communities of practice: the case of orienteering maps generation from open LIDAR data

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Digital twins as commons?

More general framework of “*géo-communs*”, launched by IGN since January 2021

<https://www.ign.fr/institut/la-demarche-geocommuns>.



- all IGN data is now open data
- mutualisation, collaboration around tools, methods, databases
- public consultation in May 2021 (165 stakeholders from various backgrounds)

Definition: “Geographic Information databases co-produced or co-maintained, and co-developed tools and methods, following an open common governance, to guarantee a full appropriation by communities of users/producers/stakeholders/citizens”

Open questions for geocommons

- ① Governance of geocommons: mediator ≠ technical coordinator
- ② Economic model: public service (open public good)
- ③ Core data: static digital twin at the national scale?
- ④ Data production: e.g. link with OSM
- ⑤ Licence: open licence but not ODbL?
- ⑥ Methods and tools: ecosystem of open source softwares
- ⑦ Open science as a part of geocommons
- ⑧ Crucial role for environmental data
- ⑨ Link with European directives for open data; European geocommons?

Research question

- one core aspect of geo-commons is their diverse sourcing, applications and stakeholders
- specific communities of practice involve niche knowledge experts, potentially rich for the construction of geo-commons, making it an interesting sociological field
- orienteering map generation with LIDAR data is an example of such a niche community of practice

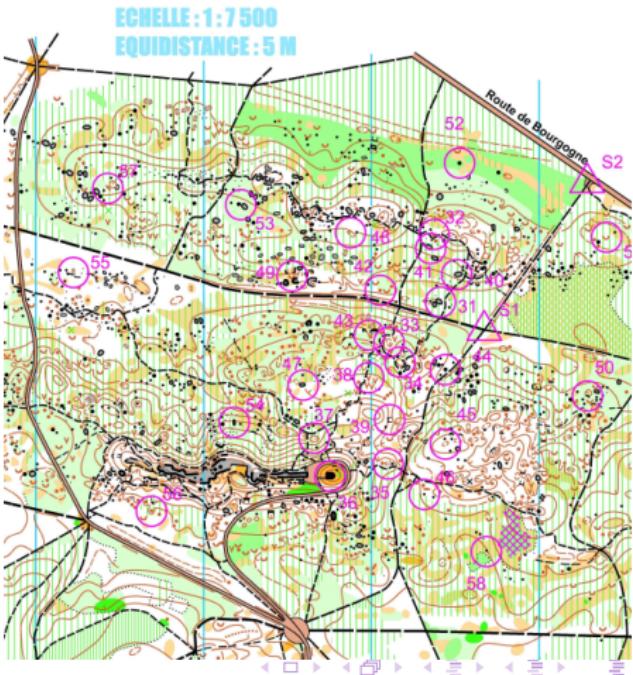
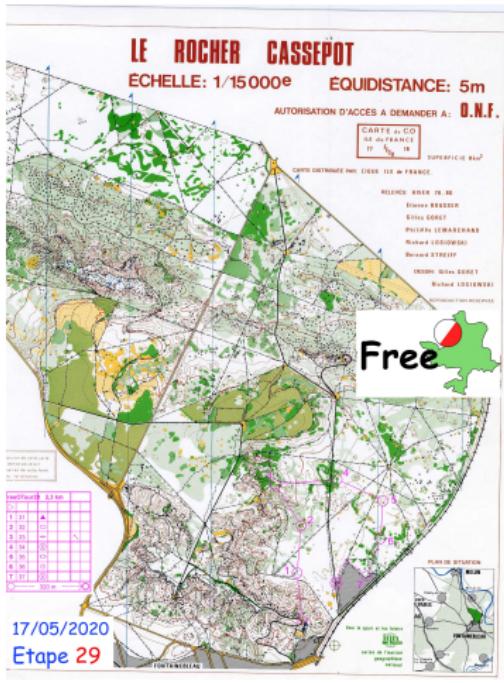
Research question:

What are the characteristics of communities using automatic orienteering map generation with LIDAR data, across different countries and contexts? How does this inform processes of geo-commons construction?

- at this stage, preliminary qualitative analysis of stakeholders and contexts.

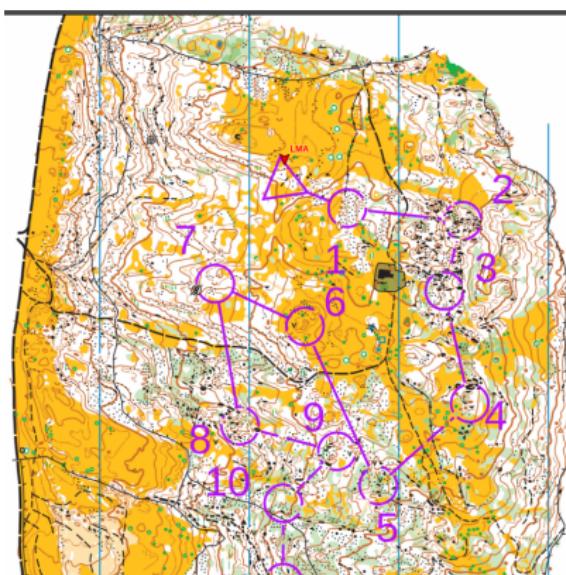
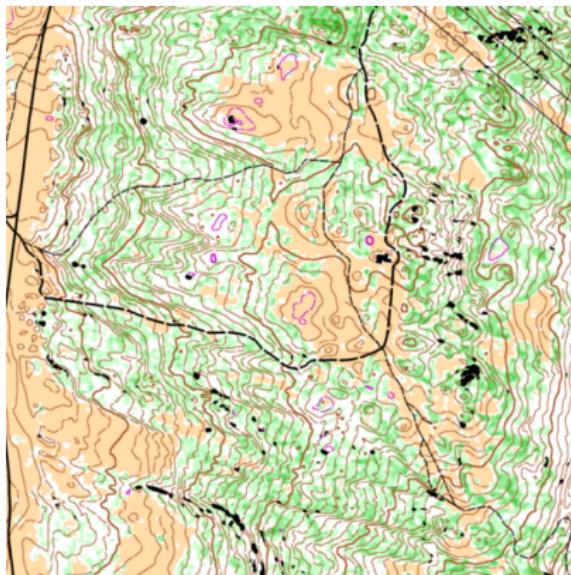
Orienteering maps

Highly detailed topographic maps (mostly forest/natural areas), scale 1/10000 or 1/15000, high production cost and few mapping experts ; mapping norms by the IOF [Zentai, 2001]



Map generation from LIDAR data

New technologies (GPS, LIDAR) have a significant potential in reducing costs and extending mapped coverage [Zentai, 2007]



Mapping coverage

High potential for outdoor activities: empower runners to discover new areas, avoid overcrowding, long-range projects, ...

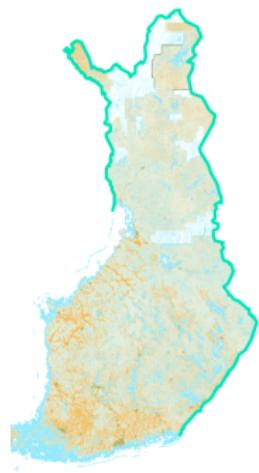
The image shows a magazine spread. On the left, a green sidebar contains a small icon of two people and the text "Par Audrey Duquenne". The main title "Across Norway, le projet fou des frères Roux" is displayed in large white letters. Below the title is a short text: "Parcourir 3000 kilomètres en orientation à travers la Norvège. Voici le projet fou que se sont lancés Corentin et Fleury Roux, orienteurs du Nose (Nature Orientation Saint-Etienne)." At the bottom of the sidebar, it says "Corentin et Fleury Roux, orienteurs du Nose". The central part of the spread features a photograph of two men, Corentin and Fleury Roux, standing on a rocky outcrop, looking at a map and pointing towards the horizon. The background shows a vast, hilly landscape under a cloudy sky. To the right of the photo is a map of Norway with a thick black line tracing a path across the country. A vertical column of text on the right side of the map reads: "ette aventure qui devrait à Fyr, le point le plus I de la Norvège, le l'aide d'une carte rojet est né d'une courir la Norvège plus de trois mois ment possible.", followed by "qui ont 100, l'".

The Mapant initiative

Free software Karttapullautin to generate base maps from LIDAR data,
open source forks also developed

<https://github.com/rphlo/rusty-pullauta>

Systematic processing in several countries with full LIDAR coverage:
(Norway, Finland, Switzerland, France, Spain, New Zealand)



The Mapant initiative



Comparative analysis

| Country | Institutional context | Data licence | Maps licence | Coverage | Usage |
|-----------------|---|------------------|--------------|---------------|--|
| Norway | Collab. State Mapping Agency / National Federation | CC-BY | CC-BY-NC | 62% | Suggested for course planning |
| Finland | Individuals | CC-BY | CC-BY | ~ 80% | Suggested as background map ; WMTS/WMS |
| Switzerland | Private company / local authorities / clubs | Various | NA | > 95% | WMTS |
| France Spain | Individuals Collab. State Mapping Agency / National Federation / Individuals | NA CC-BY/ODbL | NA CC-BY | < 5% > 95% | Elite athletes NA |
| New Zealand | Individuals | CC-BY | NA | ~ 50% | WMTS |

Results

- various stakeholders (institutional, collectivities, individuals), tools, licences, ... for mostly the same geo-common in terms of final data
- which implications in terms of durability and accessibility? Which role of local usages in the initiative?

Future work

- interviews with mappers, stakeholders, for a more detailed sociological study of production contexts
- broad online survey of usages

References I

-  Zentai, L. (2001).
Development of orienteering maps' standardization.
In *Proceedings of the 20th International Cartographic Conference, Beijing, China*, pages 6–10.
-  Zentai, L. (2007).
New technologies in making orienteering maps.