Make flow data accessible to the general public through interactive web maps, compatible with most browsers and devices

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Workshop GFlowiz

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SUMMARY

✓ Introduction to flow maps with quite large datasets
✓ Performance challenges
✓ Legibility challenges
✓ Interactivity / user interface
✓ Synthetic charts
✓ Alternative map representations
RICH FLOW MAPS CAN BE QUITE LEGIBLE...
OR NOT SO MUCH LEGIBLE...
EXAMPLE: WEB MAPS ON MOBILITY DATA
FIGURES ON COMMUTING TRIPS TO WORK

Challenge: query large databases, transfer selected data quickly through the web for sleek, fluid and legible rendering

Flows ≥ 100 → 26 000 arrows

Flows ≥ 50 → 63 000 arrows
Achieve reasonable performance on most browsers and devices

✓ Fast query <= good database indexation and solid model structure

✓ Leveraging a server cache to avoid repeating requests already executed

✓ Getting smaller file sizes by decoupling geography from statistical data

✓ Using a fast drawing engine effectively running on browsers & devices still in use in the real world (IE 11+, Chrome 40+, Firefox 40+, Android 4.4+, IOS8+…)

=> canvas rather than SVG
Enhance map legibility: discretize and make good use of color and transparency

For instance: 3 classes, a bright and thin yellow stroke for the first class

Shapes are sorted by descending thickness
ARROW TIPS ARE DIFFICULT TO READ

And overlaps to handle as well…
ORIENTATION SIGN DRAWN AT THE MIDDLE

Our fit: 2 distinct and parallel arrows

Leave a space to label main poles (background raster maps aren’t really usable nor esthetic with many symbols at the foreground)
INTERACTING WITH THE MAP: HOVERING EACH SHAPE

On mouse over each shape: display in the tooltip origin, destination and flow measure

The fact that shapes are sorted by thickness allows to « catch » all arrows

Pure canvas / pixel reading logic: no time lag or screen freezing on mouse move
INTERACTING WITH THE MAP: FILTERING DATASET BY RANGES

Quick filtering

Selecting more ranges
In addition to the full dataset rendering, a list may offer options to select regions of interest. An appropriate zoom in mechanism will help to focus instantly on the relevant extent.
INTERACTING WITH THE MAP: AGREGATING DATA ON OTHER GEOG. LEVELS
SYNTHETIC INDICATORS: TOP TEN

Flux entrants : les 10 premiers territoires

Flux sortants : les 10 premiers territoires

Solde entrées/sorties : les 10 premiers territoires
SYNTHETIC INDICATORS

Graphiques et comparaisons

Comparative evolution of incoming flows

Comparative evolution of incoming and outgoing flows

Comparative evolution of outgoing flows

Evolution of the absolute balance

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Residential migrations: municipality of residence / previous municipality of residence. Time animation easier to implement.
SIMPLIFY: FLOWS => HEDGEHOGS

N x N => N
SIMPLIFY: FLOWS => HEDGEHOGS

Filtering data by medical groups: the number of poles differ

France par code géographique PMSI 5 747 codes géographiques pmsi
Ensemble : 453 pôles

France par code géographique PMSI 5 747 codes géographiques pmsi
Ensemble : 73 pôles
SIMPLIFY: FLOWS => PROPORTIONAL CIRCLES

Animatable (on time line), enhanced by an isochron perimeter
To know more

✓ https://statistiques-locales.insee.fr/#c=indicator&i=flux.nbflux_c_n_actocc15p&s=2015&view=map1

✓ https://france-decouverte.geoclip.fr/

✓ https://www.geoclip.fr/