Interdisciplinary Centre for Mathematical and Computational Modelling

icm.edu.pl

The Team:

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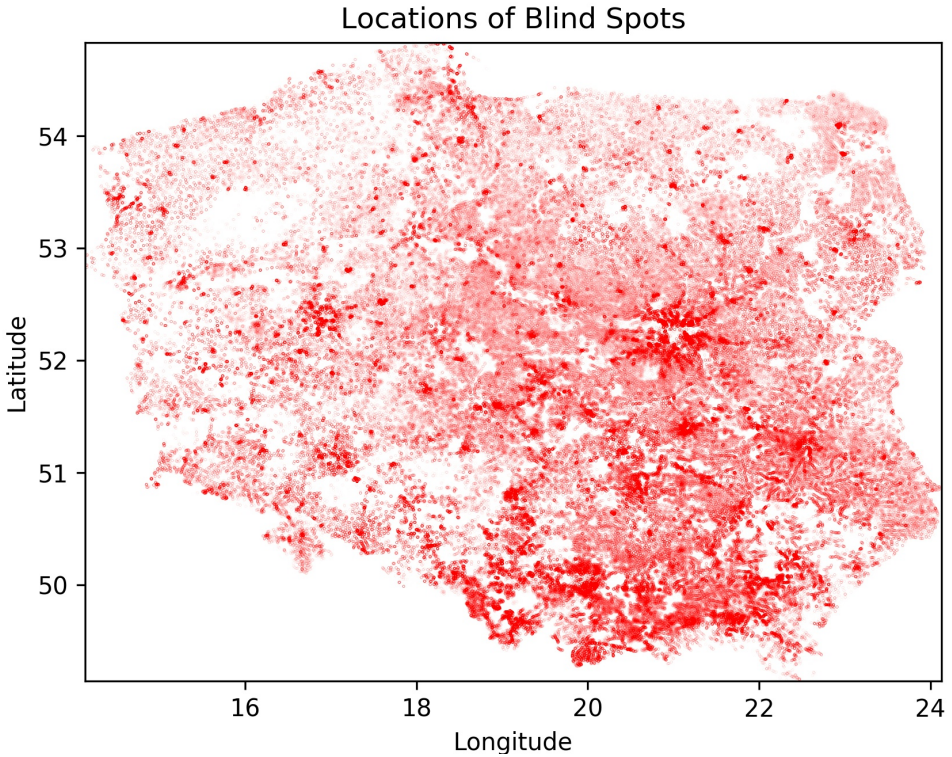
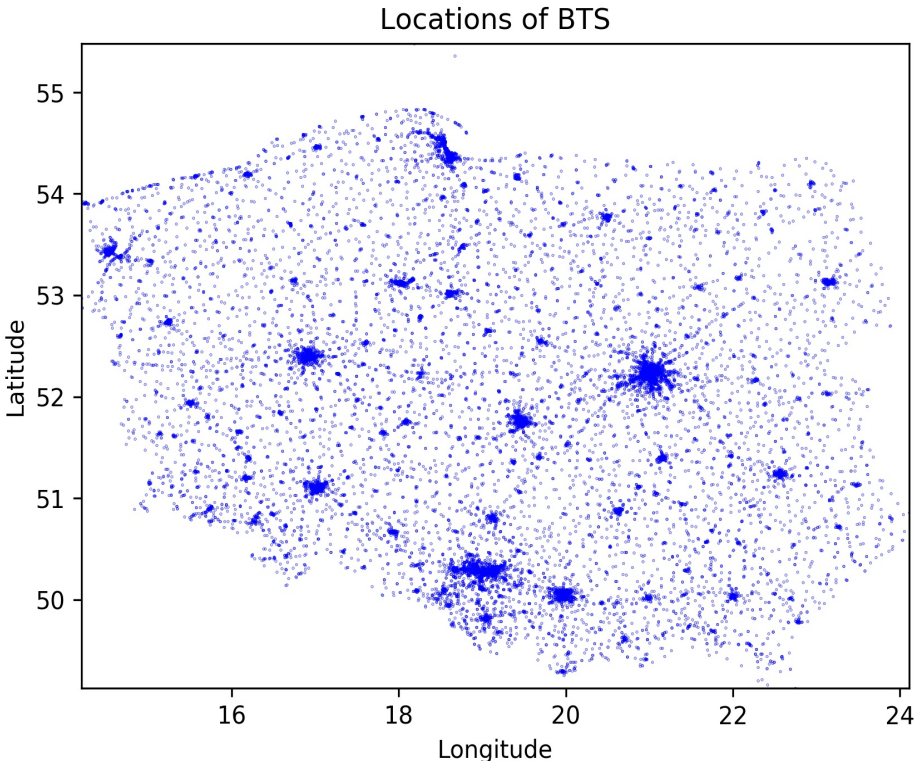
Mar 23rd 2017





Locations without high-speed internet access – "Blind Spots"

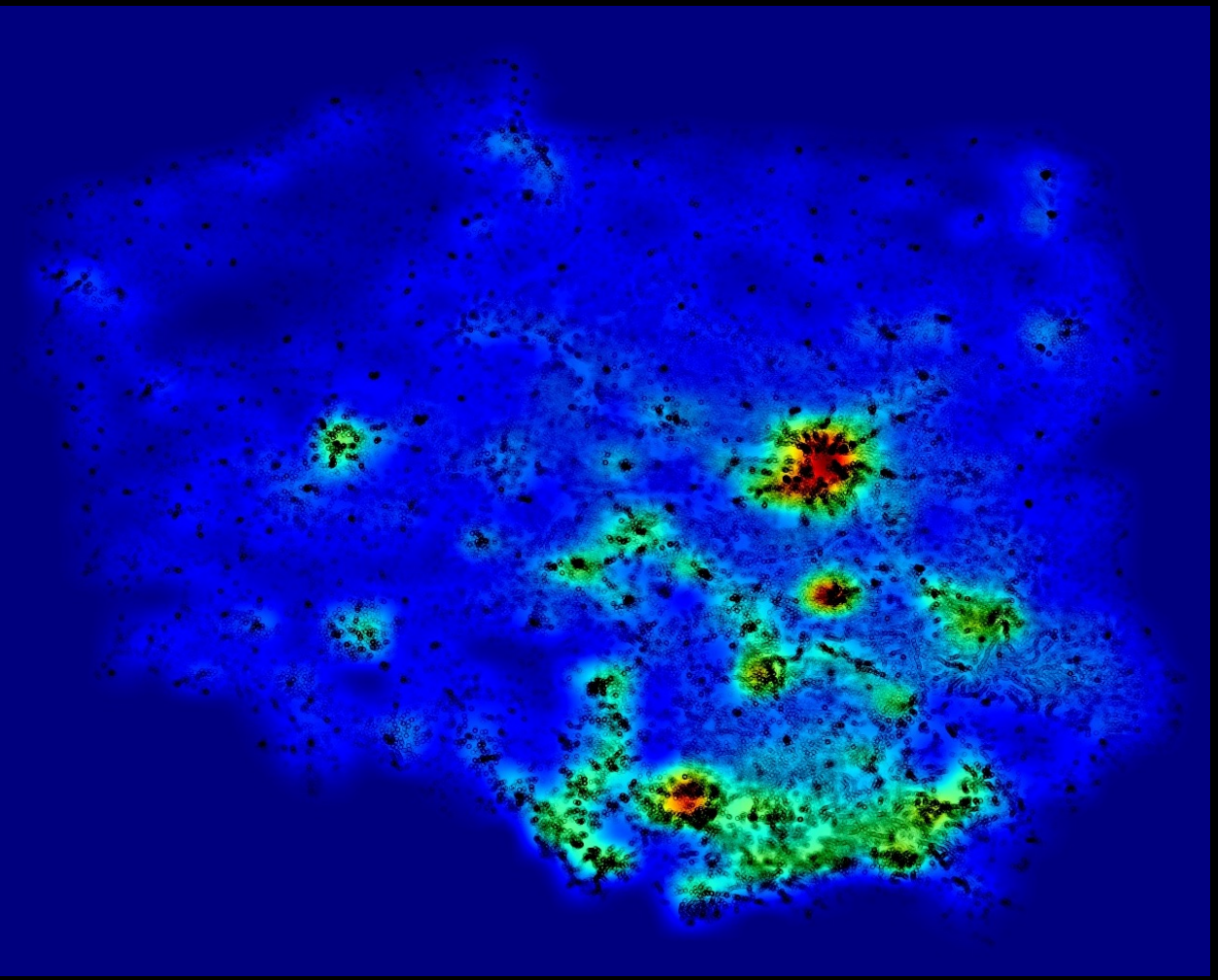
- ~2.7 m locations (exactly: 2 739 035)
- *source*: SIIS
  https://form.teleinfrastruktura.gov.pl

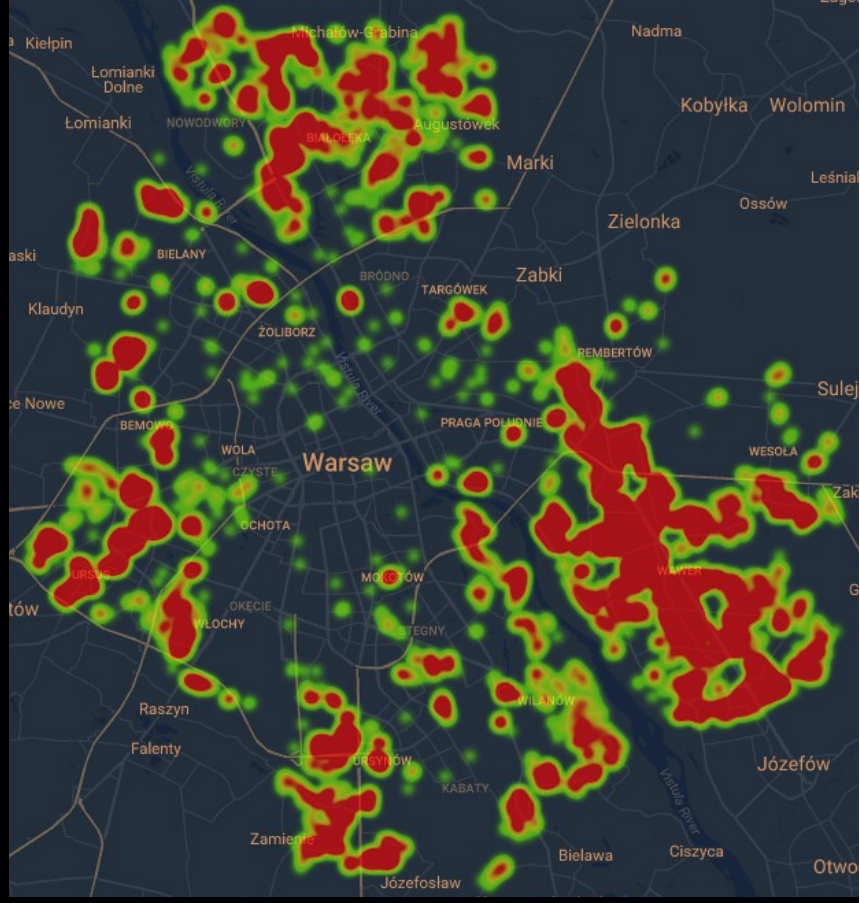
ccess points: LTE 1800 Base Transceivers (BTS)

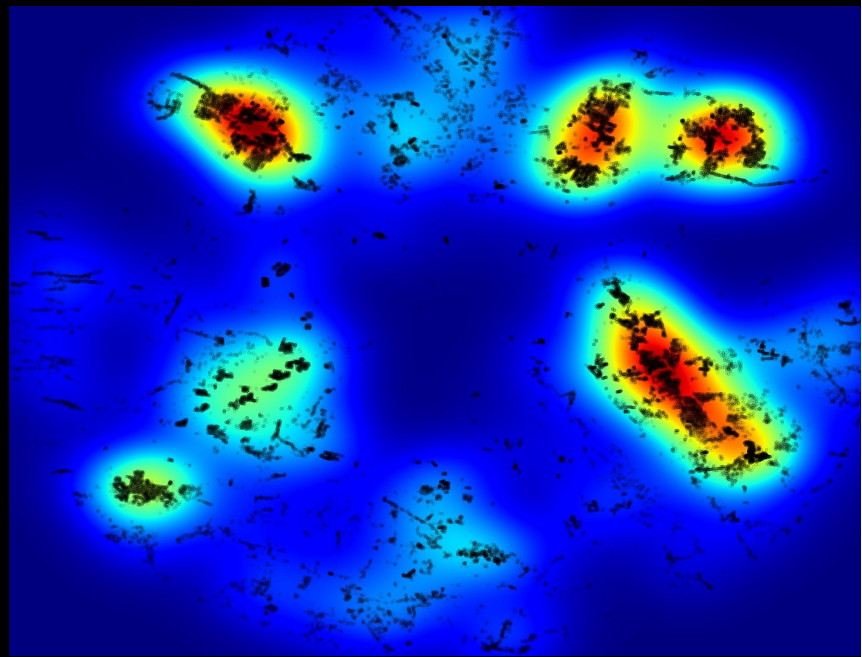
- ~20 k locations (exactly: 20 383)
- *source*: UKE (Jan 25, 2017)
  https://www.uke.gov.pl

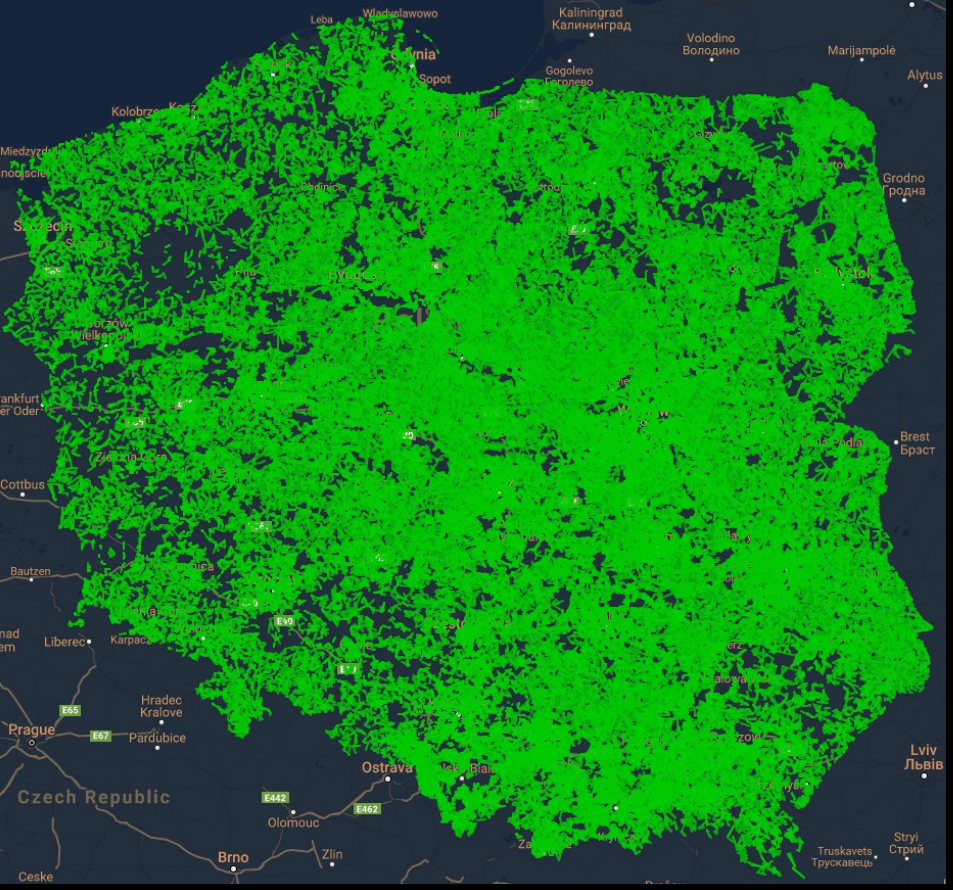
The task:

- Optimal fibre optic network (directly / streets)
- Global fibre limit: 1 m km
- Effective usage of HPC resources
- *No path forking*

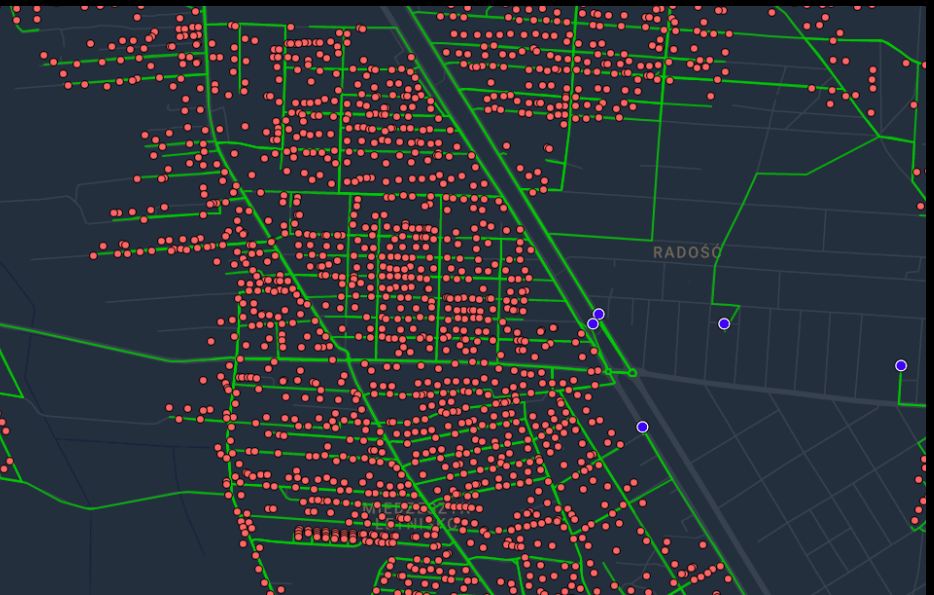



Kiełpin
Michałów-Grabina
Nadma
Łomianki Dolne
Kobyłka
Wolomin
Łomianki
NOWODWORY
BIAŁOŁĘKA
Augustówek
Marki
Leśniak
Ossów
Zielonka
BIELANY
BRÓDNO
Zabki
TARGÓWEK
Klaudyn
ŻOLIBORZ
REMBERTÓW
Sulej
BEMOWO
PRAGA POŁUDNIE
WOLA
CZYSTE
Warsaw
WESOŁA
OCHOTA
MOKOTÓW
OKĘCIE
WŁOCHY
UJAZDÓW
Raszyn
WILANÓW
Falenty
URSYNÓW
Józefów
KABATY
Zamienie
Bielawa
Ciszyca
Józefosław
Otwo





+ Open Street Map

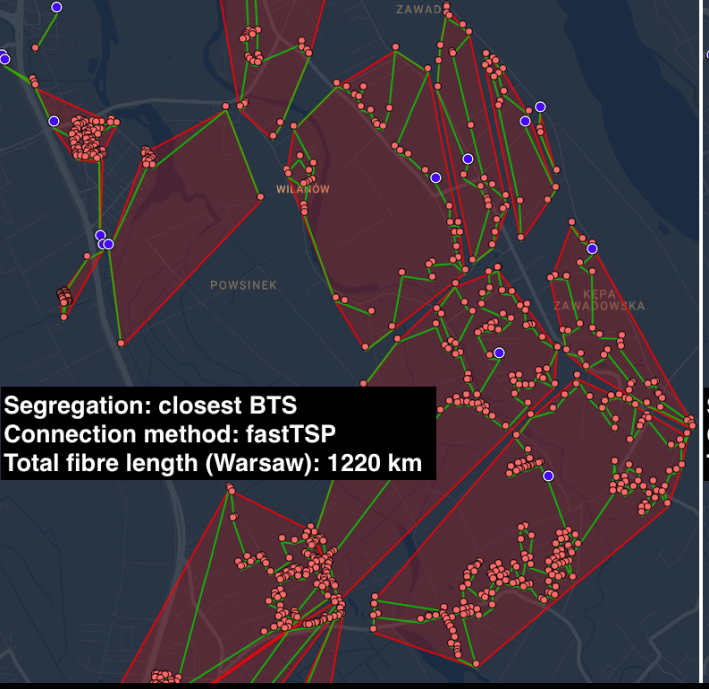


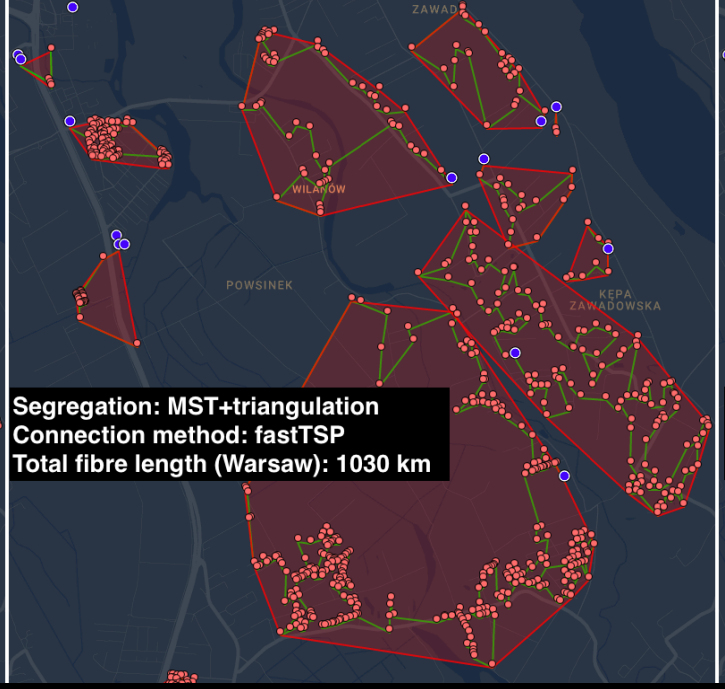
Segregate & Traveling Salesman

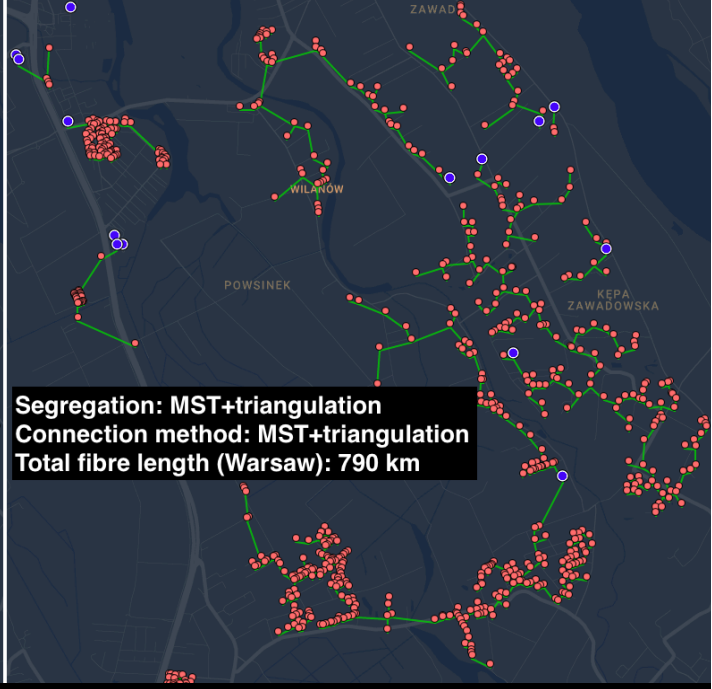
Results: (→ **compare:** 1 m km !)

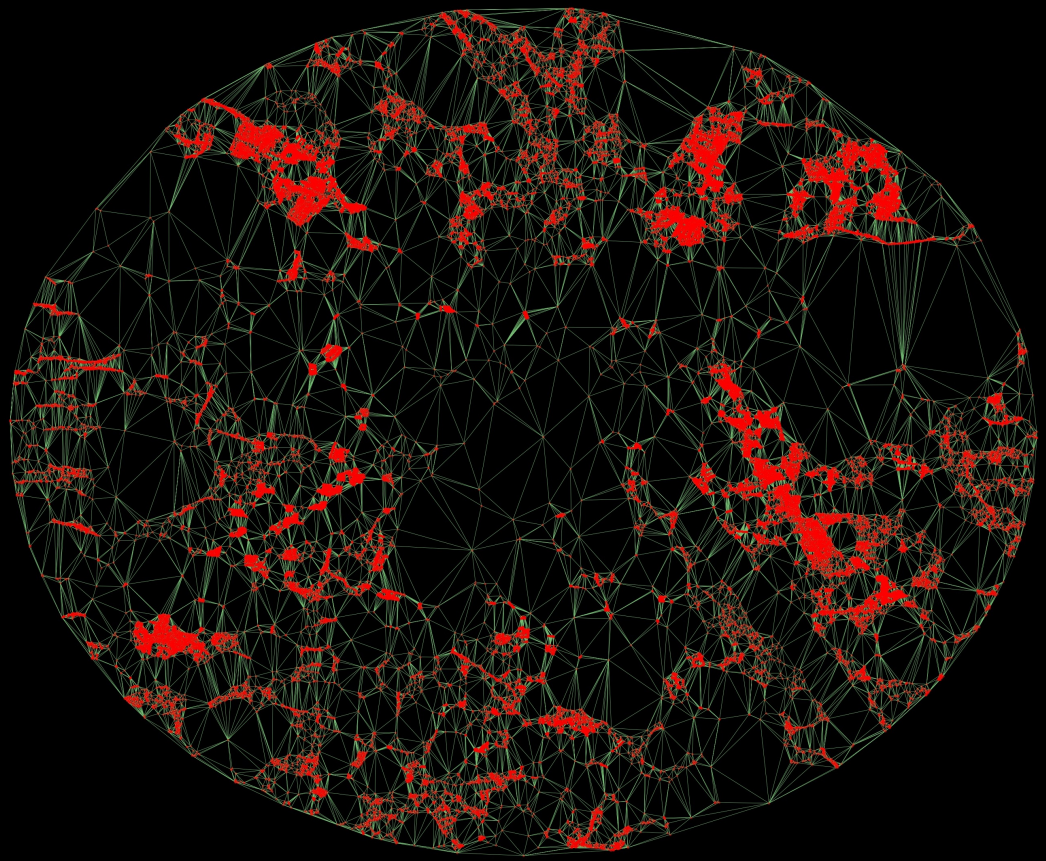
- Hackathon: ~650 k km / OSM: ~780 k km /
- Optymalizacje: ~310 k km / OSM: ~450 k km /

(improved segregation, TSP, HPC / data IO etc)









Final result: (→ **compare** 1 m km !)

~230 k km / OSM: ~380 k km /

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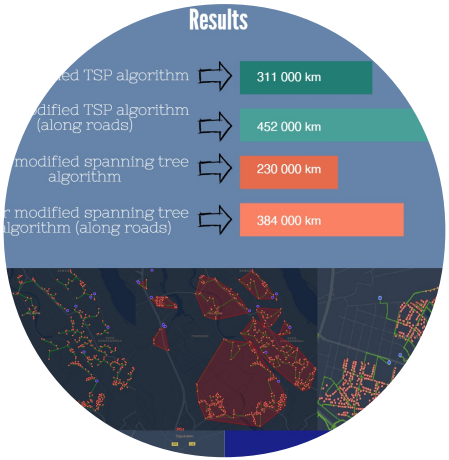
Super computer: Cray XC 40 @ ICM

Computing resources: 2880 CPUs

Application: Java + PCJ library

(Java library developed @ ICM)



Infographics:

https://goo.gl/uv08Zi

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