

Autres villes, Communautés, Approx, Effective resistance, Nouveaux clusters, Analyse de robustesse

Casser des Graphes

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May 31, 2024

Complex Networks - LIP6

Outline

Autres Villes

Communities

Effective Resistance

Analyse de robustesse sur graphe dirigé valué

Grandes attaques

Choix

Clustering

Clustering pour les nouvelles coupes

Autres Villes

Autres villes

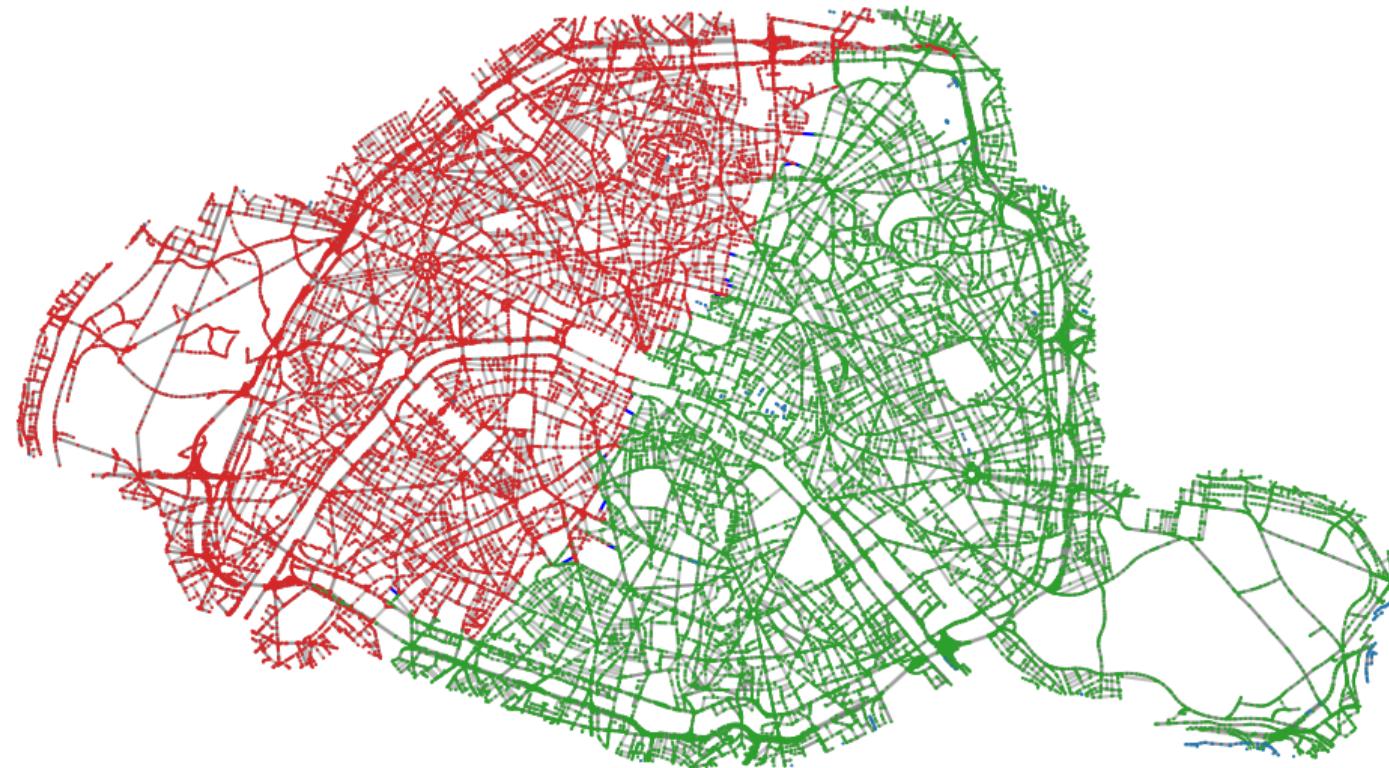
- Shanghai
- Manhattan

Tolérance ?

Buffer ?

Communities

Communautés: un autre moyen de trouver des arêtes importantes



cost: 86 edges, 196 lanes

Effective Resistance

Definition

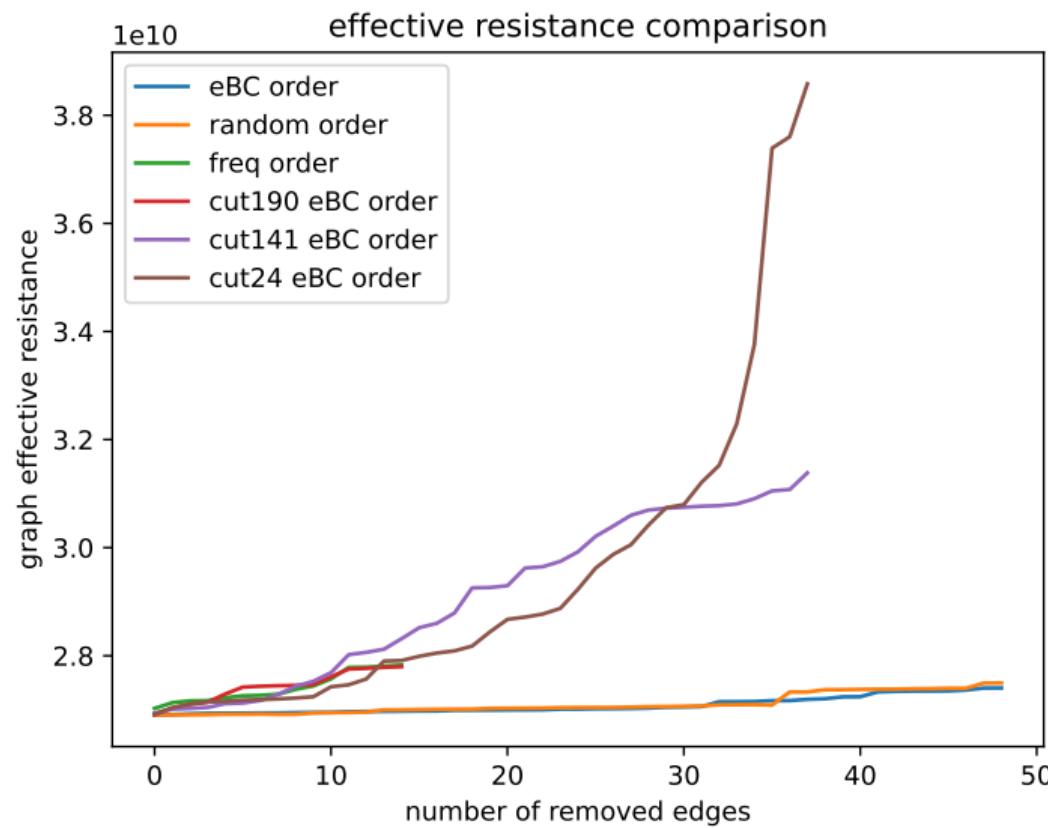
The **effective resistance** between two vertices is the electrical resistance measured with the Kirchoff's circuit laws. The **effective graph resistance** is the sum of all effective resistance (for all pairs of vertices).

Kirchoff laws:

- *current in = current out*
- *voltages of loop = 0*

(computed from Laplacian eigenvalues: $O(n^3)$)

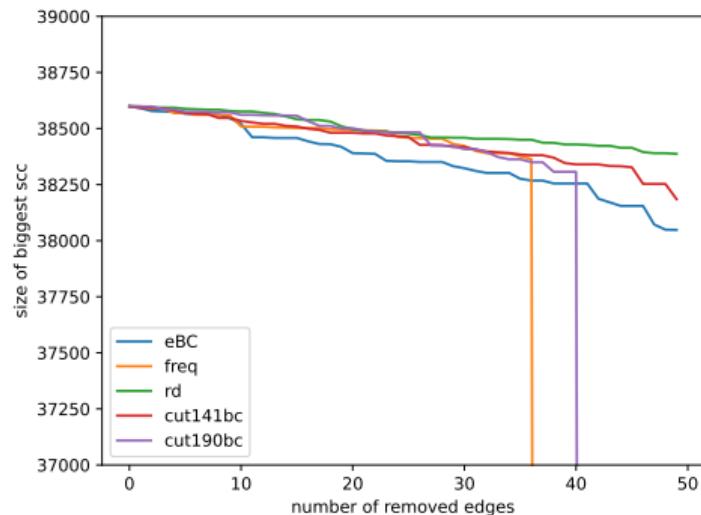
Premiers résultats de effective resistance



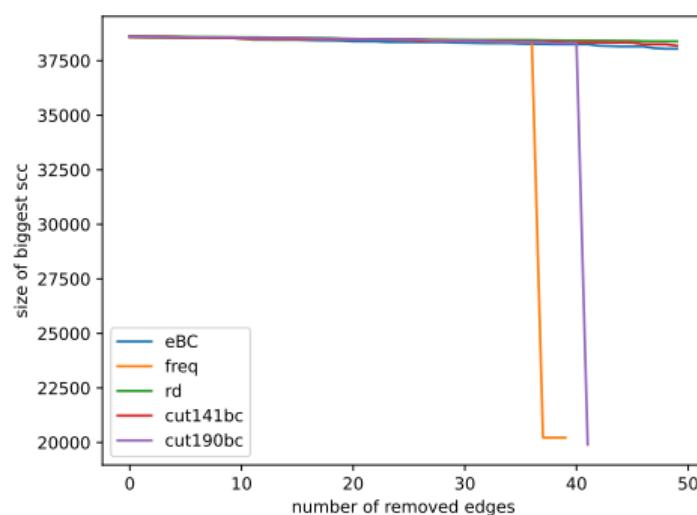
Analyse de robustesse sur graphe dirigé valué

Strongly Connected Components

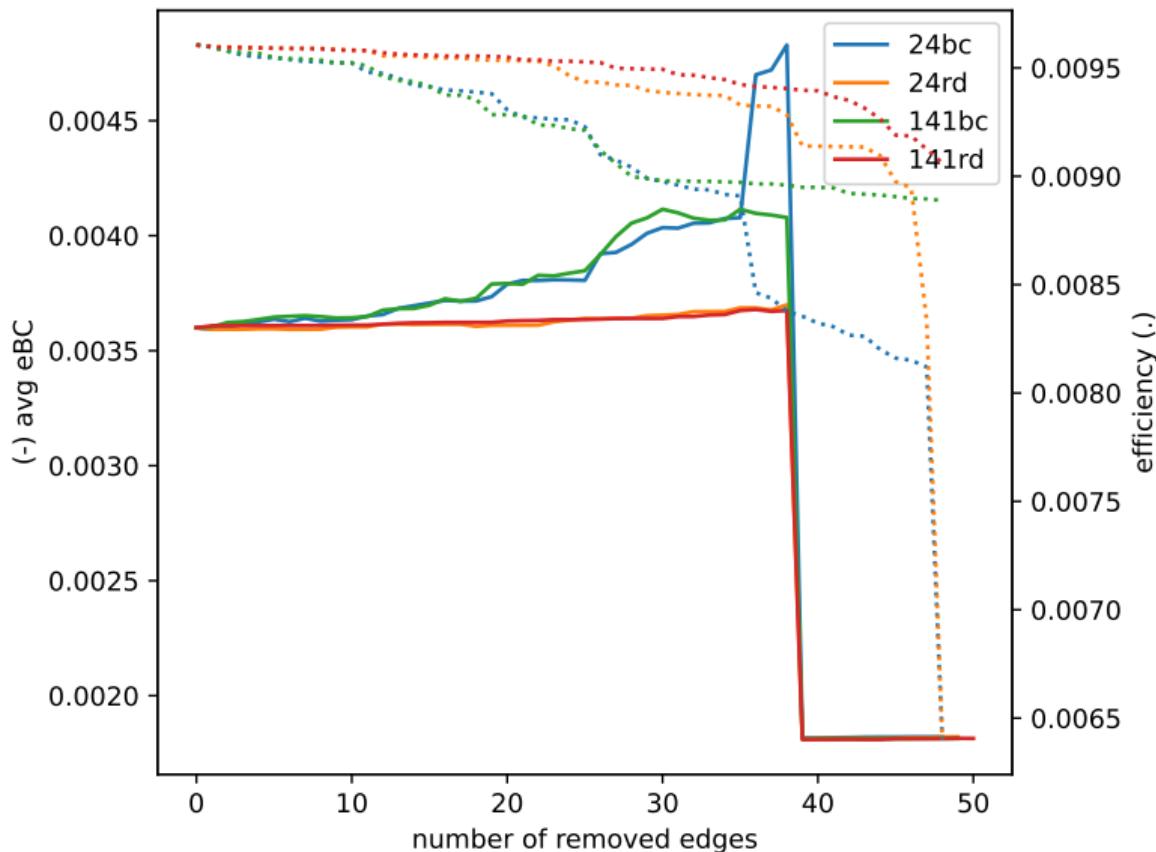
Scc evolution



Scc evolution



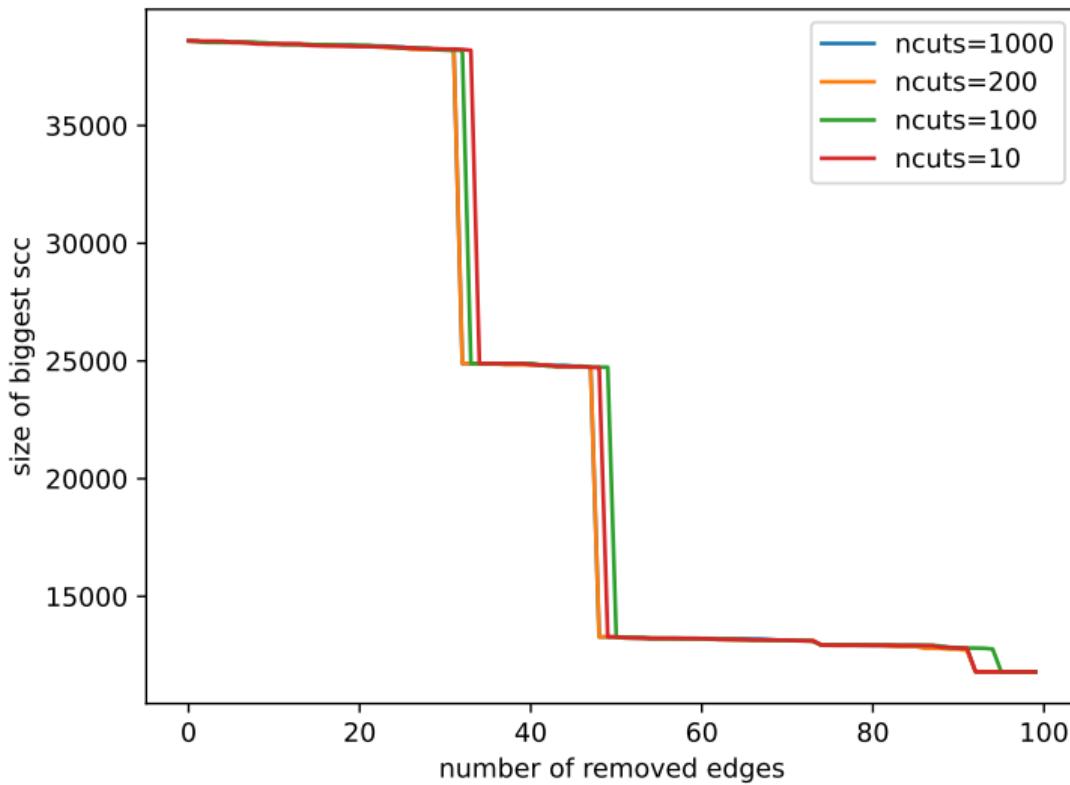
Ordre à l'intérieur d'une coupe



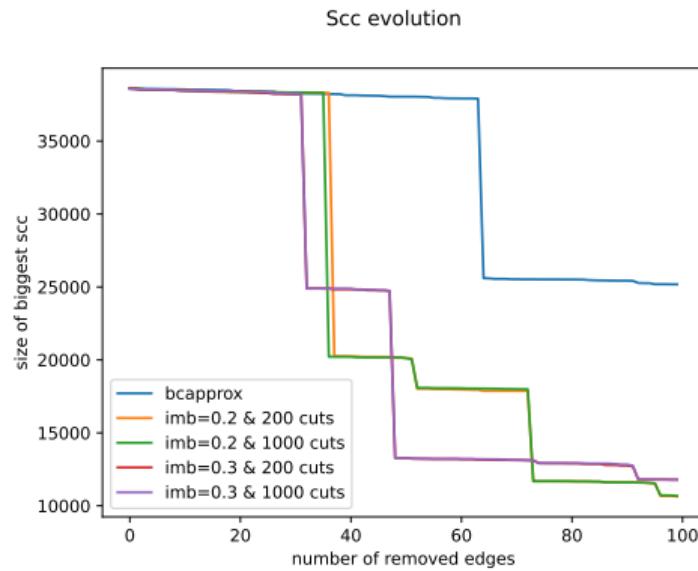
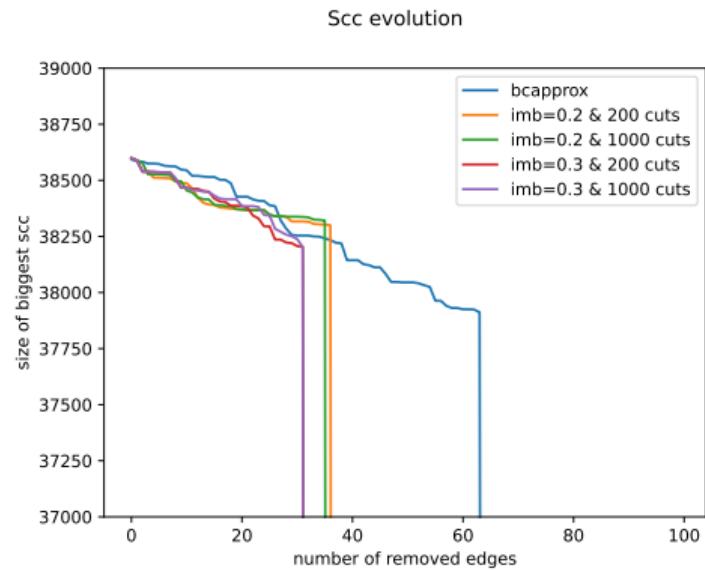
Grandes attaques

Approx frequency

Scc evolution

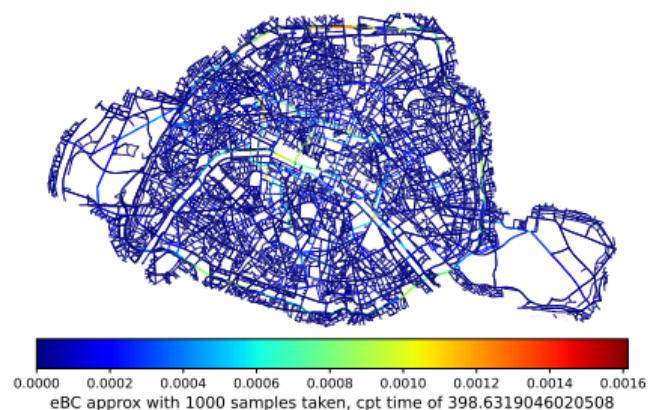
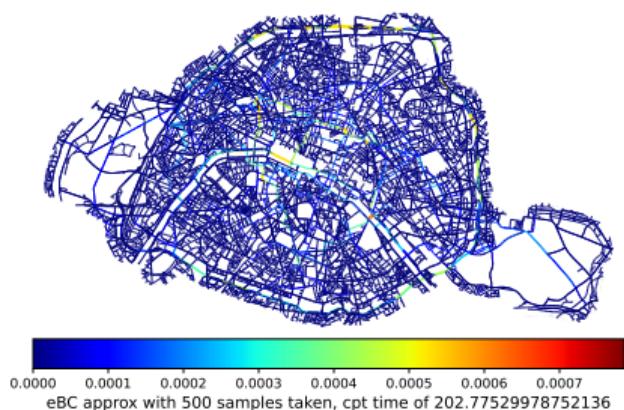


Strongly Connected Components



Choix

Choix de l'approximation eBC



Choix du nombre de coupes

Temps sur ma machine pour n coupes:

n	1	200	1000
imb = 0.05, nblocs = 2	0.5"	1'08"	7'30"
imb = 0.05, nblocs = 3	0.8"	2'15"	14'10"
imb = 0.1, nblocs = 2	0.8"	2'30"	13'15"
imb = 0.2, nblocs = 2	0.4"	1'23"	6'25"
imb = 0.3, nblocs = 2	0.45"	1'30"	7'04"

Clustering

Clustering: idées et questions

Distance: Utilisation de la distance de Chamfer.

Pour deux ensembles de coupes C_1 et C_2 :

$$\sum_{c_1 \in C_1} \min_{c_2 \in C_2} \{c_1, c_2\} + \sum_{c_2 \in C_2} \min_{c_1 \in C_1} \{c_1, c_2\}$$

avec d la distance géographique.

Possibilités de l'approximer, mais l'article est pas facile.

Clustering: idées et questions

Ensuite quel algorithme ?

- BIRCH → centroïde ?
- BallTree → linéaire ?