

# *Trabesque*

## *Application d'exploration et de géovisualisation de données de flux et de réseaux*

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**Flux, réseaux et mouvements dans le geoweb**

Site web du projet : <https://geoflowiz.hypotheses.org/>

IFSTTAR direction scientifique – collaboration CNRS

Projet fédérateur MobTransNum & AP GEOWEB (GDR Magis)

### **2 objectifs :**

- Recenser les applications web (carto)graphiques de données décrivant des mobilités spatio-temporelles
- Développer une application web de géovisualisation de flux, de réseaux et de mouvements



# Arabesque

- *Arabesque*, application libre de cartographie thématique de flux et réseaux
- <http://arabesque.ifsttar.fr/>
- Son code source est disponible sur le dépôt : <https://github.com/gflowiz/arabesque>
- Bibliothèques et données :





# Objectifs



- Traiter de **grands jeux** de **données multiscalaires** tels des matrices O/D
- **Calculer** des **indicateurs de base** sur les réseaux et les flux : indegree, outdegree, volume, solde
- **Paramétrer** la géométrie, le style des figurés et leur sémiologie (taille, couleur, valeur, orientation...)
- **Filtrer l'information** de façon interactive (liens, nœuds, attributs)
- **Choisir sa projection** cartographique et son **fond de carte**
- **Exporter** une carte vectorielle légendée respectant les principes de sémiologie graphique



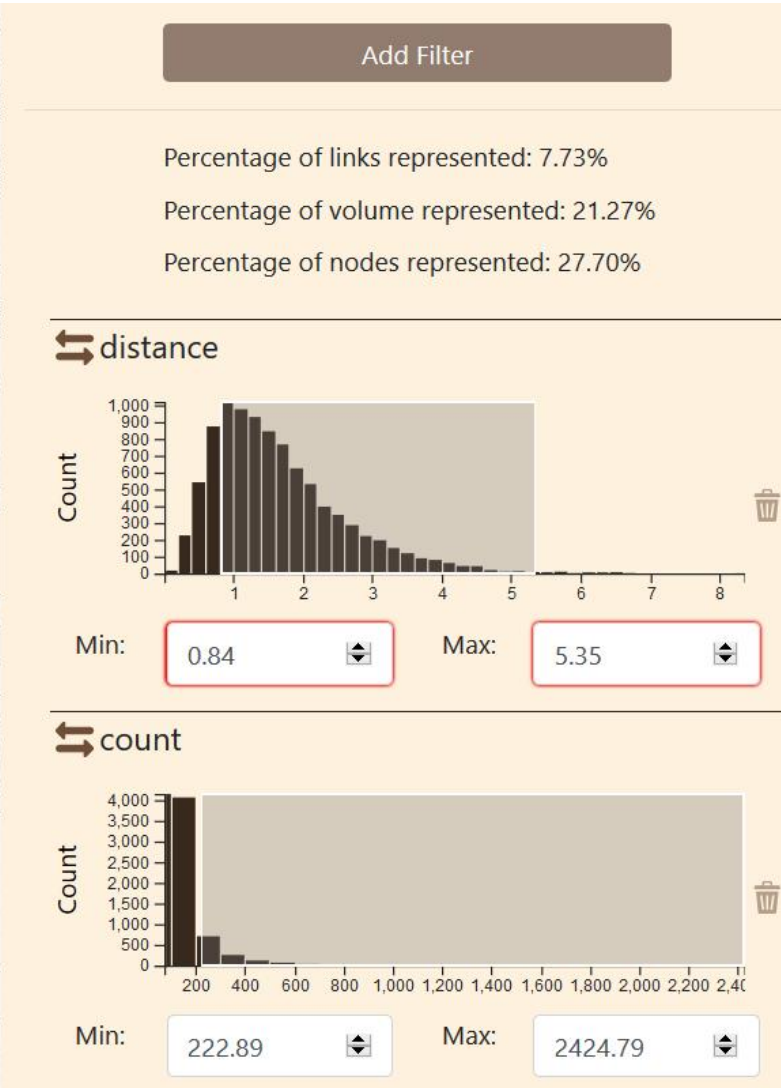
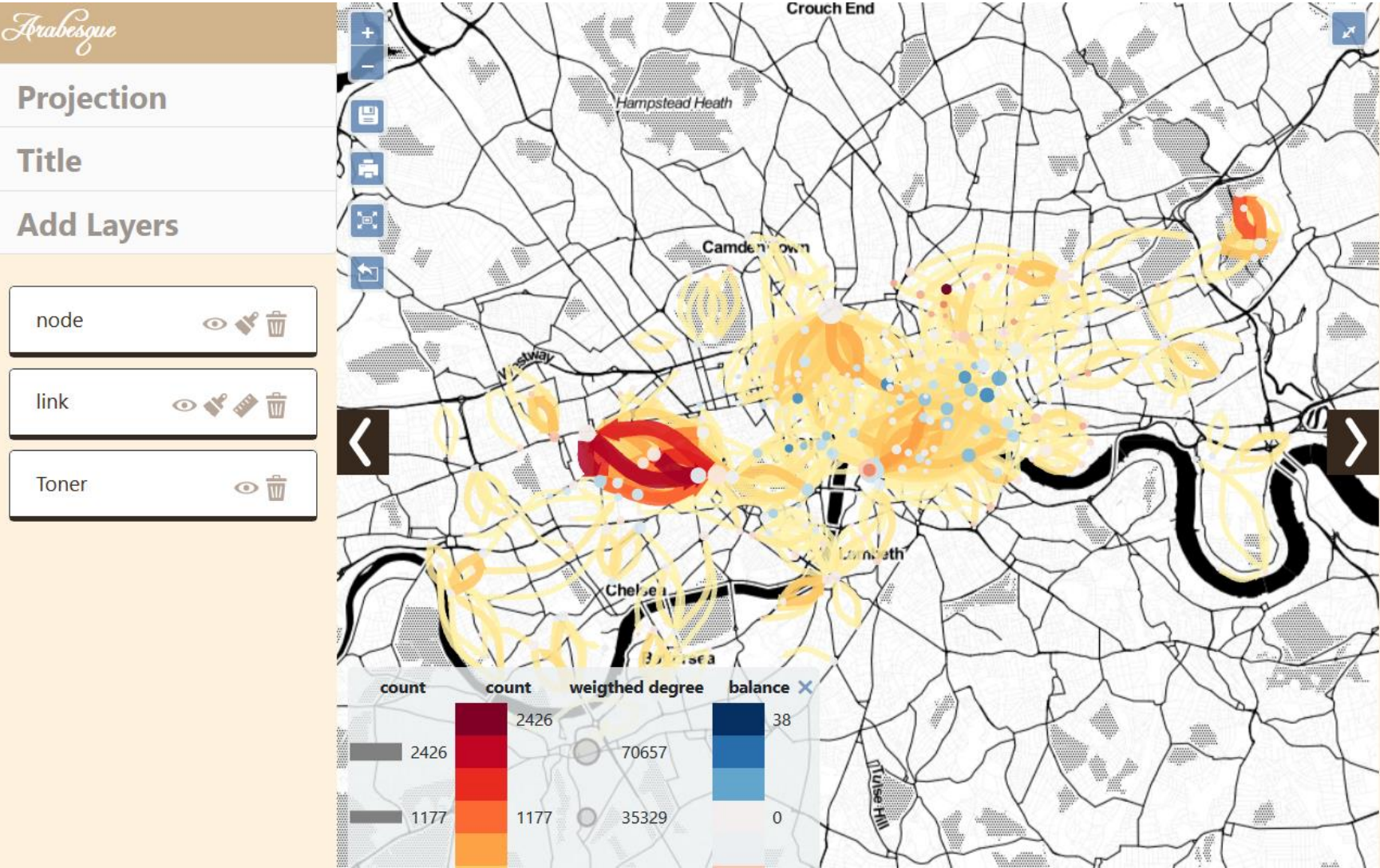
# *5 grandes étapes*

- 1.Importer** des données (liens et/ou nœuds)
- 2.Traiter** (création d'indicateurs statistiques)
- 3.Explorer et filtrer**
- 4.Symboliser**
- 5.Sauver et exporter**



Données de démo  
Bike Sharing  
Niveau Local

# L'interface







*Arabesque*

**Projection**





**Title**

**Add Layers**

link



node



volume

degree

degree

1.34e+9

2494

6.69e+8

1247

1.00

0.05

1.00

5000 km

Count

Min:





# Visualisation par défaut





# Démo

Projection

Title

Add Layers

link

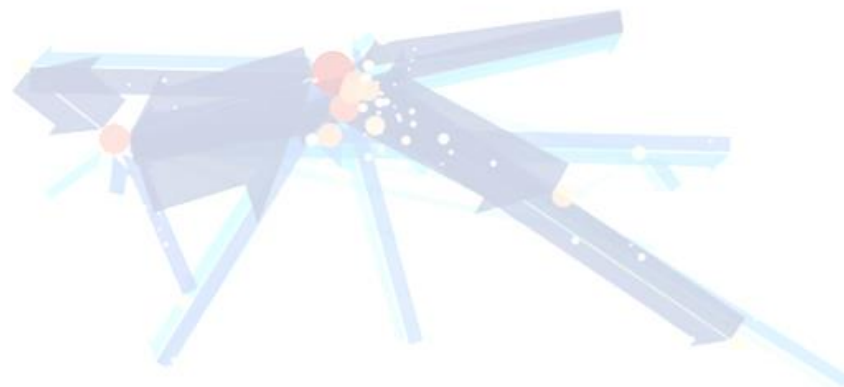
node

Add Filter

Percentage of links represented:  
10.00%

Percentage of volume represented:  
83.57%

Percentage of nodes represented:  
36.69%

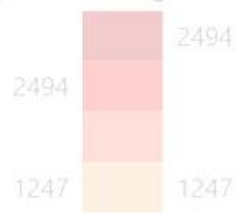
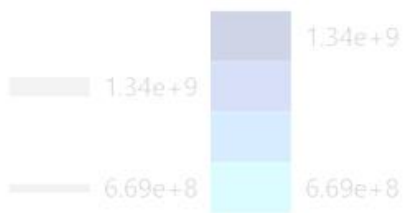


volume

volume

degree

degree



volume

















Min:



12190351







Max:

13383595

# Deux jeux de données de demo



Plus visités  Débuter avec Firefox  SelectorGadget



## Demo

### Bikes Sharing

Number of trips between stations of the London's Santander Cycle Hire Scheme in 2017, [source: Data London](#).

Explore

### Swiss Commuting

Daily commutes in Switzerland (2014), [source: Swiss Federal Statistical Office](#).

Explore

# Importation d'une liste de liens

The screenshot shows a web browser window with the address bar displaying `arabesque.ifsttar.fr`. The browser's toolbar includes navigation buttons (back, forward, refresh, home), a security indicator, and various extension icons. The website's header features the 'Arabesque' logo and navigation links for 'Gallery', 'Guide', and 'Project'. A 'Flow Import' dialog box is open in the center of the screen. This dialog box contains four dropdown menus: 'ID Origin' (set to 'idorigine'), 'ID Dest' (set to 'iddestination'), 'Volume' (set to 'volume'), and 'Aggregation Function' (with a dropdown menu open showing options: 'Sum', 'Mean' (highlighted in blue), 'Median', 'Max', and 'Min'). An 'Import Location' button is located at the bottom of the dialog. The background of the website is dimmed, showing a 'Begin new map' section with a file upload area containing 'SAGEO\_RICardo...' and 'mall.csv', and a 'To f' section.

Flow Import

ID Origin: idorigine

ID Dest: iddestination

Volume: volume

Aggregation Function: Mean

Import Location

Demo

# Ajouter un filtre

The screenshot displays the Arabesque software interface. A 'New Filter' dialog box is open, showing the 'Layer' set to 'Link' and the 'Variable' dropdown menu open with 'decennie' selected. The background shows a network map with nodes and links, a sidebar with 'link' and 'node' layers, and a right panel with statistics and a histogram.

**Projection**

**Title**

**Add Layers**

link

node

**New Filter**

Layer: Link

Variable: Choose... (dropdown menu open with options: Choose..., idorigine, iddestination, **decennie**, volume, distance)

**Statistics:**

- Percentage of links represented: 10.00%
- Percentage of volume represented: 83.57%
- Percentage of nodes represented: 36.69%

**Histogram:**

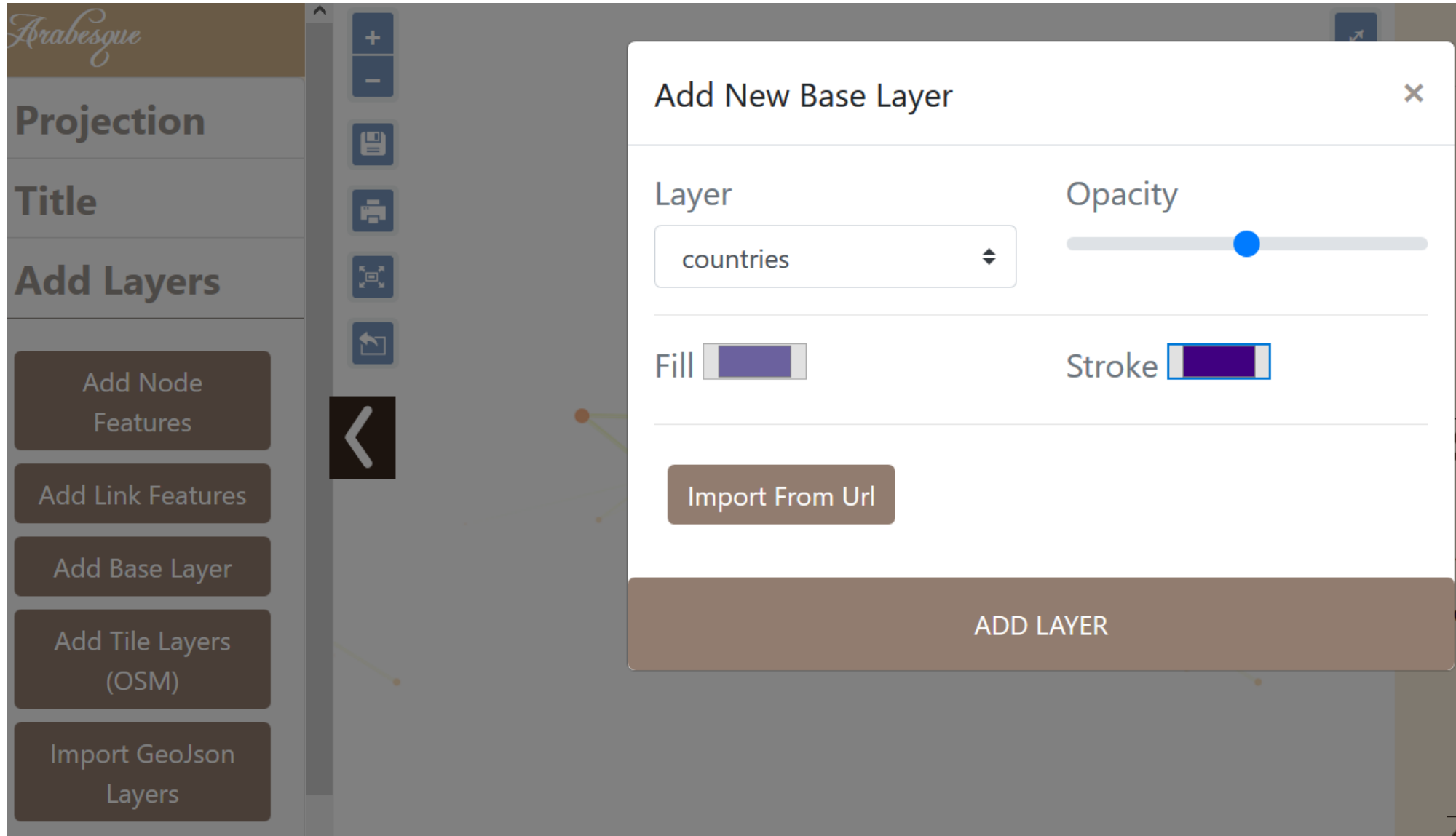
volume

Count

Min: 12190351

Max: 13383595

# Ajouter un fond de carte





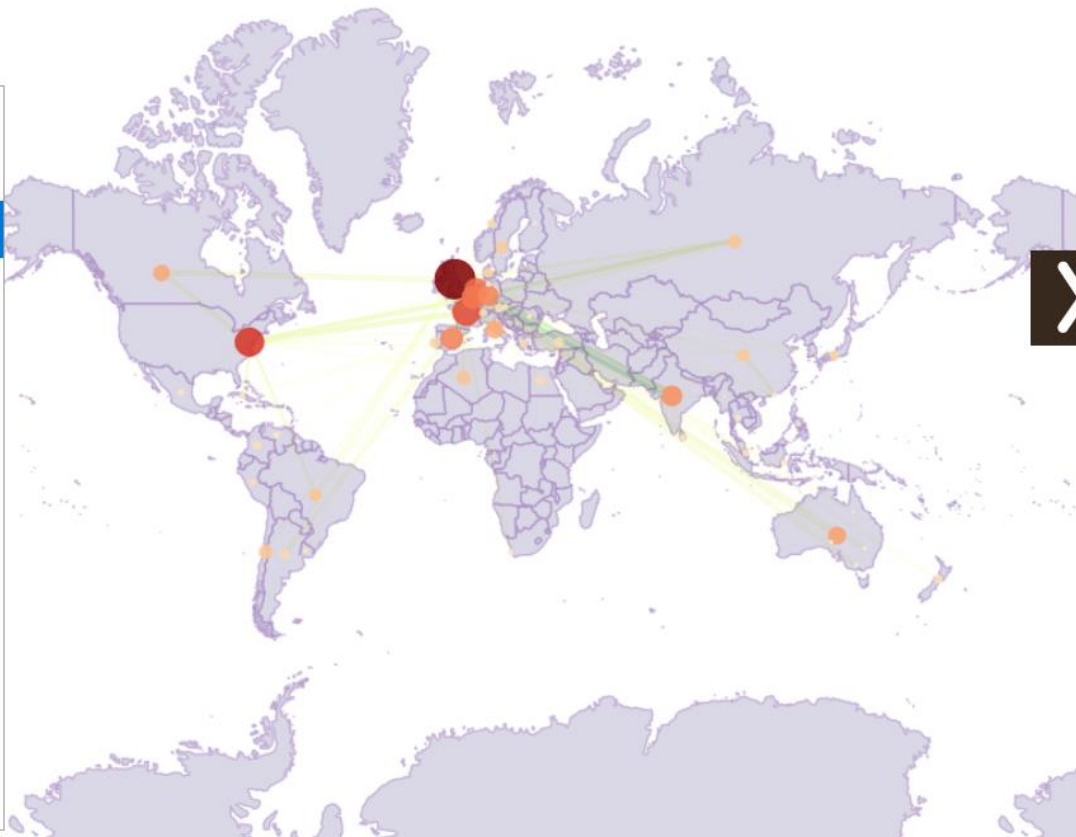
# Changer de projection

Arabesque

## Projection

Choc ▾ Change

- Choose...
- Mercator / EPSG:3857
- Sphere Mollweide / ESRI:53009**
- RGF93 / Lambert-93 -- France
- ETRS89 / LAEA Europe
- World Azimuthal Equidistant
- Transversal Mercator
- Gnomonic
- EPSG:23032
- EPSG:5479
- World Mollweide / EPSG:54009
- Quadrilateralized Spherical Cube
- PeirceQuincuncial



A world map with a light purple background. Nodes are represented by colored circles (red, orange, green) and are connected by thin lines. A dense cluster of nodes is visible in Europe, with lines radiating outwards to other nodes in North America, Africa, and Asia. A black arrow points to the right, indicating a transition or action.

Add Filter

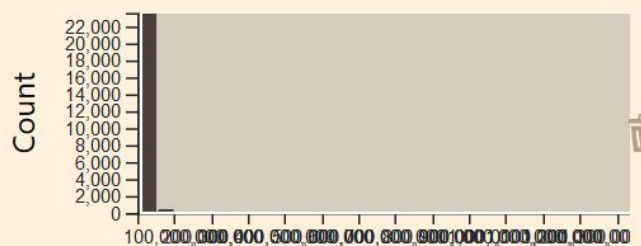
Percentage of links represented:  
0.84%

Percentage of volume  
represented: 6.56%

Percentage of nodes represented:  
15.69%

↔ volume

Count



Min: 1219035 ▾ Max: 1338359 ▾

↔ decennie

1890

# Paramétrer l'apparence des liens

The interface is divided into a left sidebar and a main styling panel.

**Left Sidebar:**

- Projection:** Sphere Mercator (Change)
- EPSG.io:** 4326, France ... (Search)
- Title:**
- Add Layers:**
- countries:** (eye icon, lock icon, trash icon)
- link:** (eye icon, lock icon, trash icon)
- node:** (eye icon, lock icon, trash icon)

**Main Styling Panel:**

**Color:**

- Varied:** (dropdown)
- Variable:** volume (dropdown)
- Type:** quantitative (dropdown)
- Inverse:** ☐
- Color Palettes:**
  - Diverging:** 10 color swatches
  - Sequential:** 10 color swatches
  - Multi Hue:** 10 color swatches
  - Single Hue:** 10 color swatches
  - Extra Palettes:** 10 color swatches

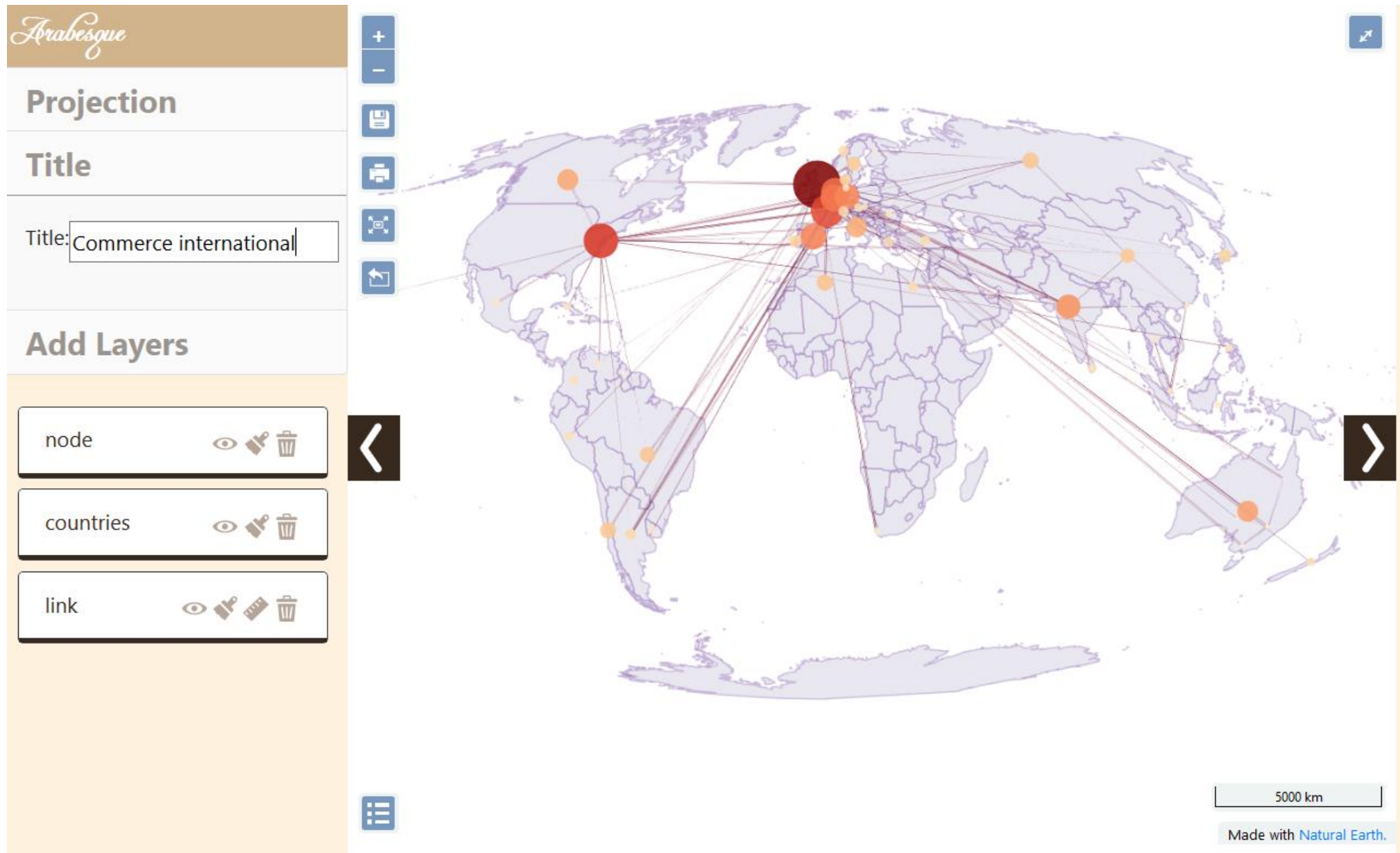
**Size:**

- Varied:** (dropdown)
- Variable:** volume (dropdown)
- Scale:** Square (dropdown)
- Ratio:** 100 (dropdown)

**Opacity:**

- Fixed:** (dropdown)
- Value:** 0.85 (dropdown)

# Ajouter un titre, une légende...





# Perspectives

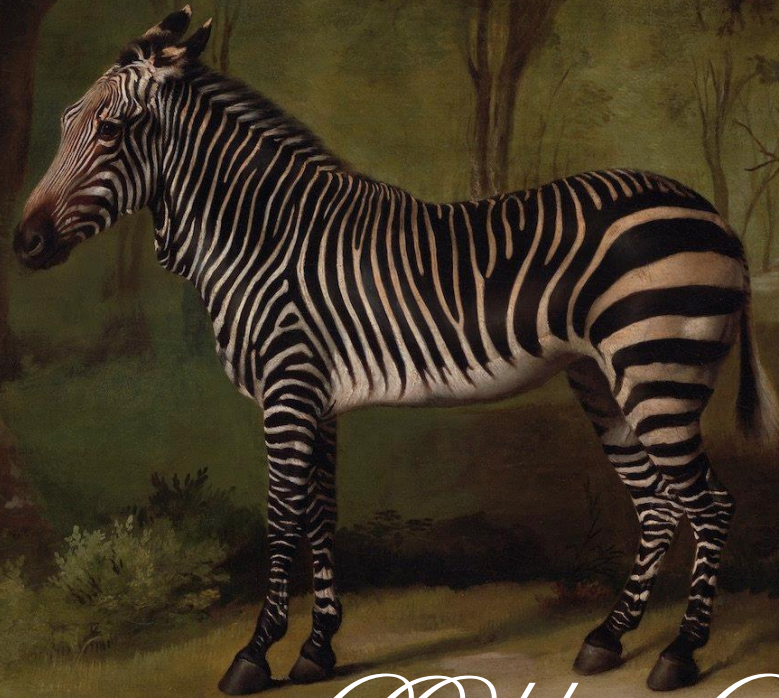


- Poursuivre le développement en ajoutant des fonctionnalités (indicateurs sur les liens, filtrage spatial, calculatrice de champs...)
- Prendre en compte les données de graphes bipartites
- Défi de l'export vectoriel
- **N'hésitez pas à contribuer !**

**<https://github.com/gflowiz/arabesque>**



*Merci pour votre attention !*



*<http://arabesque.isttar.fr/>*