LONDON MULTIPLEX TRANSPORTATION NETWORK

Last update: 1 July 2014

Reference and Acknowledgments

This README file accompanies the dataset representing the multiplex transportation network of London (UK). If you use this dataset in your work either for analysis or for visualization, you should acknowledge/cite the following paper:

that can be found at the following URL:

http://www.pnas.org/content/111/23/8351.abstract

Visit

PLEXMATH: http://www.plexmath.eu/

ALEPHSYS: http://deim.urv.cat/~alephsys/

for further details.

Description of the dataset

Data was collected in 2013 from the official website of Transport for London (https://www.tfl.gov.uk/) and manually cross-checked.

Nodes are train stations in London and edges encode existing routes between stations. Underground, Overground and DLR stations are considered (see https://www.tfl.gov.uk/ for further details). The multiplex network used in the paper makes use of three layers corresponding to:

1. The aggregation to a single weighted graph of the networks of stations corresponding to each underground line (e.g., District, Circle, etc)
2. The network of stations connected by Overground
3. The network of stations connected by DLR

There are 369 nodes in total, labelled with integer ID between 0 and 368. The multiplex is

undirected (with only one direction specified) and weighted, stored as edges list in the file

```
london_transport_multiplex.edges
```

with format

```
layerID nodeID nodeID weight
```

The IDs of all layers are stored in

```
london_transport_layers.txt
```

The IDs of nodes, together with their geographical coordinates (latitude and longitude in deg) can be found in the file

```
london_transport_nodes.txt
```

For completeness, we provide in the file

```
london_transport_raw.edges
```

with format

```
Line Station Station
```

the raw list of connections between stations specifying the Tube line in plain text. This should facilitate the construction of a multiplex network with up to 13 layers (11 Underground lines + Overground + DLR)

Real disruptions in London transport

As part of the study, we have collected information about real disruptions ("no "service" status) in London transport from Twitter (see the paper and its suppl. inf. for further details). Here, we provide the disrupted multiplex networks used in the study, i.e., the multiplex networks constructed by accounting for specific disruptions. In file

```
london_transport_disruptions_summary.txt
```

we list the disruptions considered, providing the following details:

```
DisruptionID Line Station_A Station_B Frequency(in %) Affected_nodes(in %)%
```

whereas in the folder

```
Disruptions
```

we stored the multiplex networks in the same format as described above. The name of each file is

```
london_transport_multiplex_XXX.edges
```

where the disruption ID is placed instead of XXX.

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Contacts

If you find any error in the dataset or you have questions, please contact

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