GEOMETRIC MEASURE THEORY
OPTIMAL MASS TRANSPORTATION
AND PARTIAL DIFFERENTIAL EQUATIONS

Wardrop's equilibrium and adjustment of OD matrices

FARHAD HATAMI

Universitat Autònoma de Barcelona

An origin-destination (OD) matrix is a matrix that says how many drivers go from and to a fixed set of points in a traffic network. Starting with an OD matrix, simulation tools simulate traffic quantities all over a given network. Finding an OD matrix that reproduces somehow real traffic conditions is not an easy task, and is usually done by combining two steps:

- Each OD matrix produces a unique distribution of traffic flow on the network, known as *Wardrop's equilibrium*. Essentially, it states that all paths sharing the same origin and destination should take the same total travel cost. Once equilibrium paths (depending on the OD matrix) are determined, network flows can be directly calculated (simulated).
- Traffic flow estimates obtained from an OD matrix might be different from real flow measurements. The problem then consists of changing our initial OD matrix to fit real data. This is called the *adjustment problem*.

We investigate a new algorithm to perform matrix adjustment with L^1 norm penalization. The main advantage of such penalization is that for high values of the penalization constant, the flows from some origin destination pairs become null, and thus, the sparsity of the OD matrix increases.