Finding Eulerian paths/tours

Problem solved?

- Number of possible Eulerian/Chinese Postman tours in a graph

Generally an exponential number of compatible sequences

- Value computed by application of the BEST theorem (Hutchinson, 197

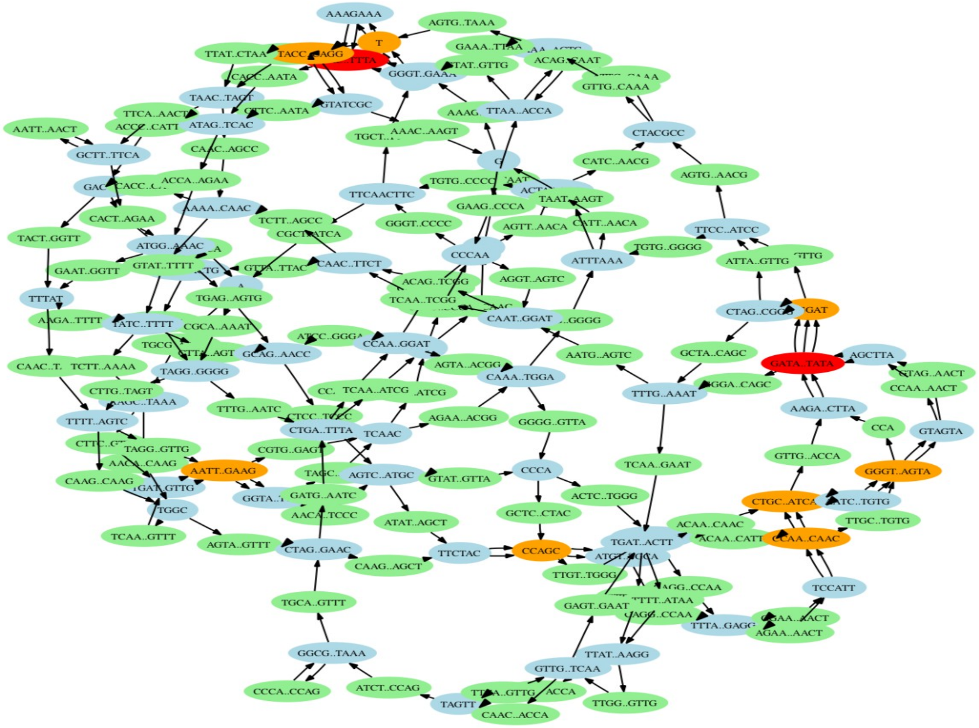
$$\mathcal{W}(G,t) = (\det L)\left\{\prod_{u\in V}(r_u - 1)!\right\}\left\{\prod_{(u,v)\in E} a_{uv}!\right\}^{-1}$$

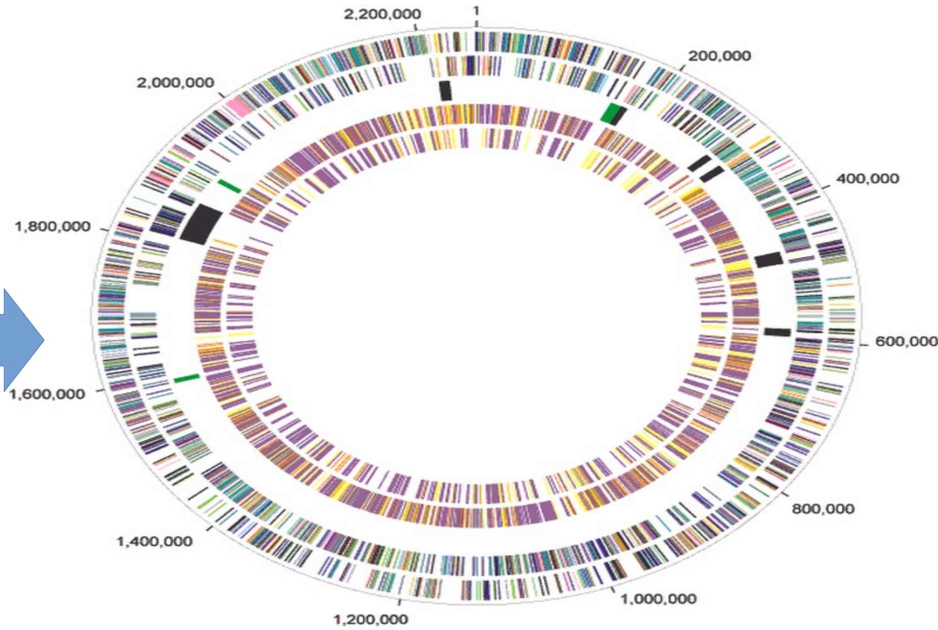
L = n x n matrix with r_u-a_{uu} along the diagonal and -a_{uv} in entry uv

r_u = $d^+(u)+1$ if $u=t$, or $d^+(u)$ otherwise

a_{uv} = multiplicity of edge from u to v

There are no shortcuts in assembly





<u>Theorem:</u> Must try all possible assemblies before finding the correct one

Peltola et al. 1970s

Myers et al. 1990s

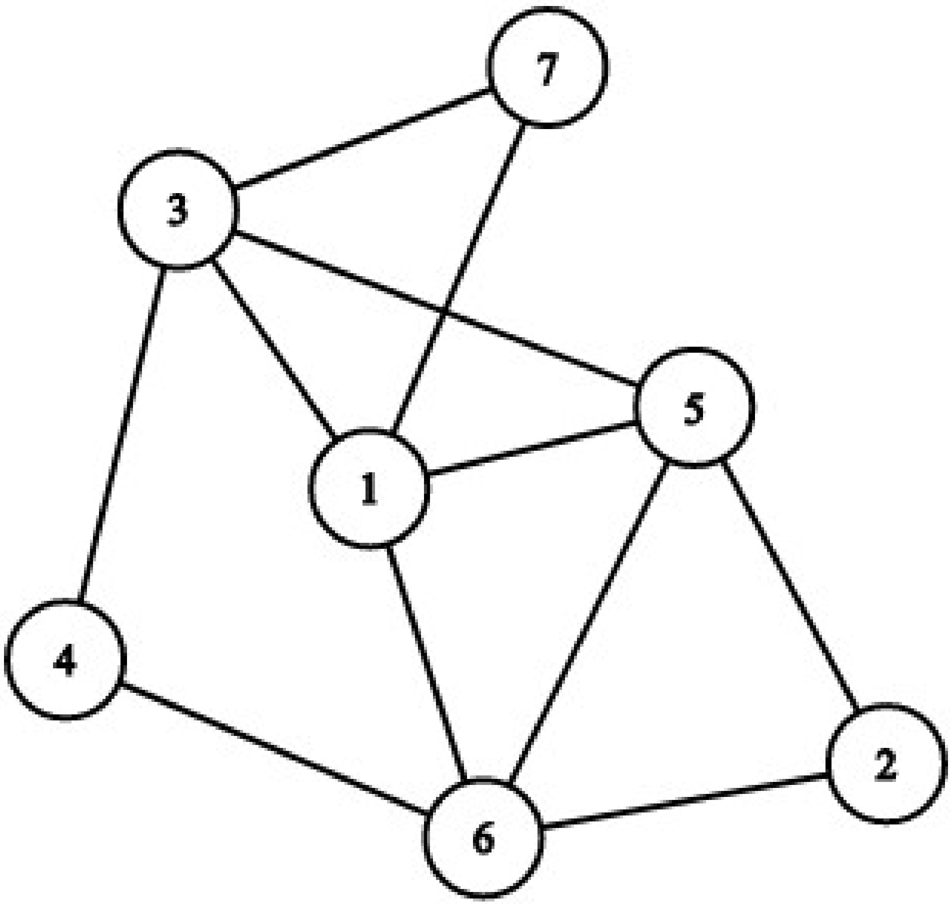
Medvedev et al. 2000s

Nagarajan et al. 2000s

Two approaches

- Greedy
  - Keep visiting non-visited edges and fix mistakes later
- Using a guide-tree
  - Build spanning tree
  - Traverse graph using spanning tree as escape route

Greedy



Spanning tree