Exploration methods for Luti models

1 Introduction

2 Model

2.1 Experience plan

The free Luti parameters are :

- α relocation rate
- λ cost of energy
- β discrete choice parameter
- γ_A Cobb-Douglas exponent actives
- γ_E Cobb-Douglas exponent employments
- v_0 network speed

We use the following indicators :

- Network indicators (fixed by the scenario and the replication), both contradictory objective for which the network generation heuristic finds a compromise :
  - network relative cost : length of the network relative to the length of the full euclidian network between all centers
  - network performance : [Banos and Genre-Grandpierre, 2012]
- Sustainability indicators (should be the objective of PSE / OSE / calibrations). Can be contradictory but not clear :
  - Evolution of the average accessibility between initial and final state
  - Average congestion, approximated by the average betweenness centrality
- Urban form indicators : four dimensions (moran, average distance, entropy, hierarchy) [Raimbault, 2017] for population and employments

3 Results

3.1 Sensitivity to the spatial configuration

First direct sampling to check the relative sensitivity to parameters, to see if we should fix spatial configurations

Basic experience plan (commit) : LHS for parameters (400) x 6 scenarios x Random spatial configurations (100 repetitions)

Results

References

[Banos and Genre-Grandpierre, 2012] Banos, A. and Genre-Grandpierre, C. (2012). Towards new metrics for urban road networks: Some preliminary evidence from agent-based simulations. In *Agent-based models of geographical systems*, pages 627–641. Springer.

[Raimbault, 2017] Raimbault, J. (2017). Calibration of a Density-based Model of Urban Morphogenesis. *ArXiv e-prints*.