Extracting knowledge from simulation models: trends and perspectives from the viewpoint of quantitative geography

J. Raimbault[1,2,*]

juste.raimbault@polytechnique.edu

[1]Complex Systems Institute, Paris, UPS CNRS 3611 ISC-PIF
[2]UMR CNRS 8504 Géographie-cités

CCS 2018

Satellite Methods and Epistemologies of Simulation Thessaloniki

September 26th 2018

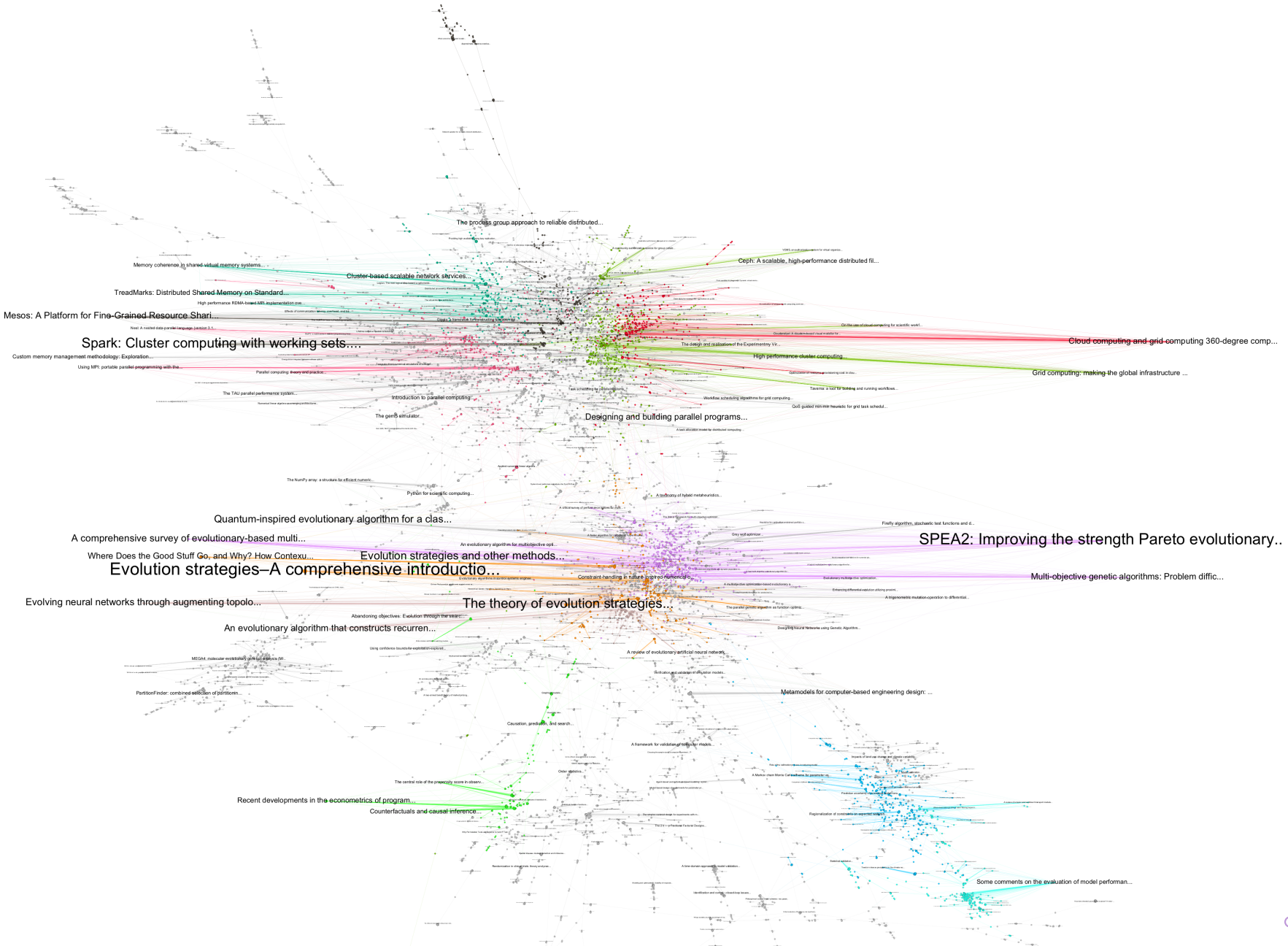
A long history of simulation in TQG

Source:

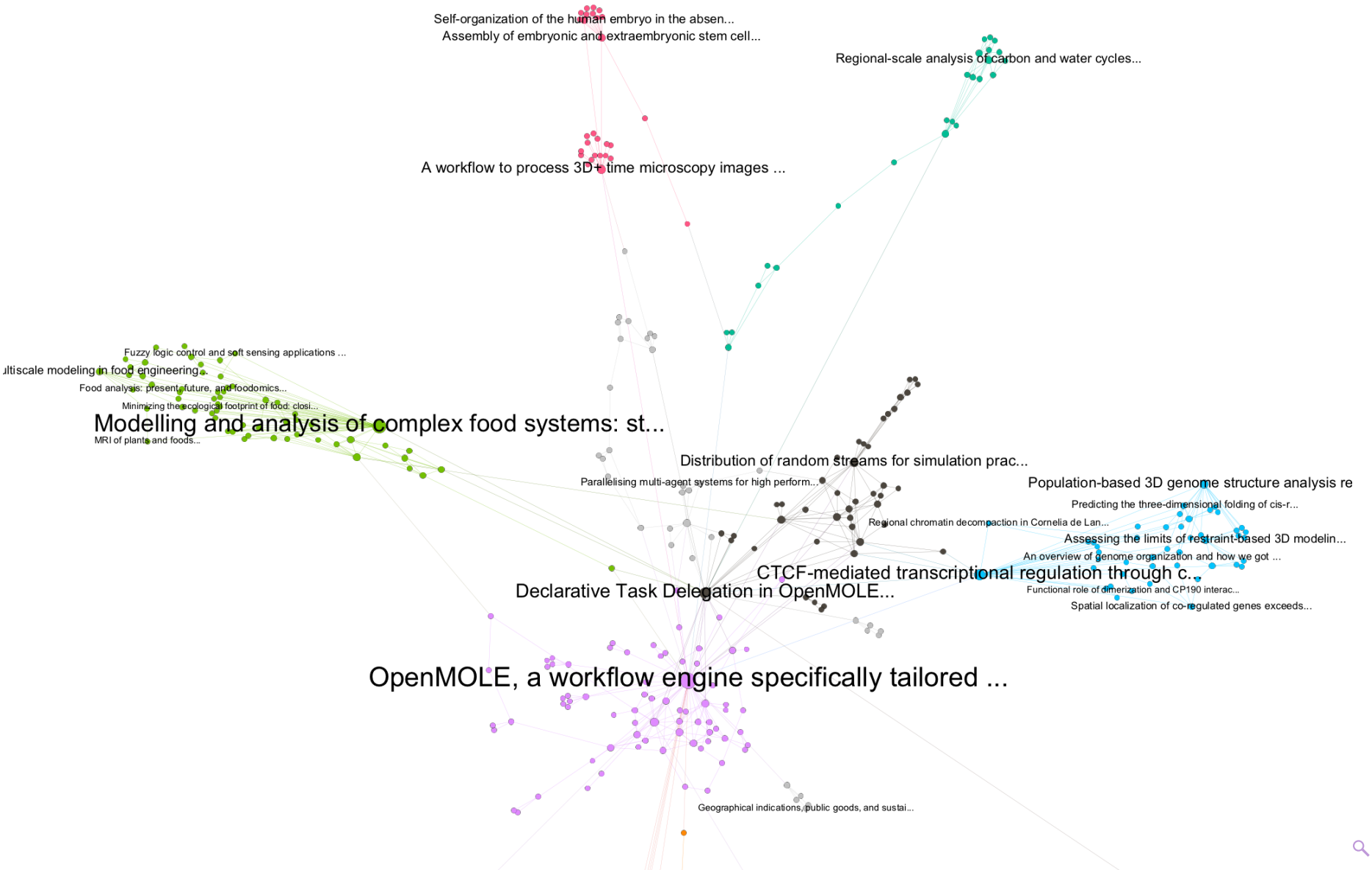
Current trends in (geo-)simulation and OpenMole's positioning

[Arribas-Bel and Reades, 2018] new geographic data science
[Perez et al., 2016] key challenges in ABM for planning: addressing complexity in a clean way, addressing multi-dimensionality, feasible trajectories, participatory planning.
Simulation models [Banos, 2013]: interdiscplinarity, data-driven models, exploration of models, multi-objective issues, reproducibility and reuse of models, coupling models.
[Banos, 2017] deeper knowledge
[Behnisch and Meinel, 2018] quantifying urban growth and form, mining spatio-temporal data, geosimulation, multi-scalar approaches

Citation network analysis



Citation network analysis



Perspectives and open issues for simulation in geography

Dealing with overfitting

Model coupling

Direct and inverse mapping

Handling stochasticity

Spatio-temporal modeling issues: non-stationarity

Spatio-temporal synthetic data

An integrated view

Applied perspectivism to couple modeling approaches

Conclusion

$\rightarrow$

Related works

Raimbault, J. (2017, December). An Applied Knowledge Framework to Study Complex Systems. In Complex Systems Design & Management (pp. 31-45). arXiv:1706.09244.

Raimbault, J. (2018). Caractérisation et modélisation de la co-évolution des réseaux de transport et des territoires (Doctoral dissertation, Université Paris 7 Denis Diderot). `https://halshs.archives-ouvertes.fr/tel-01857741`

Reserve Slides

References I


Arribas-Bel, D. and Reades, J. (2018).
Geography and computers: Past, present, and future.
Geography Compass, page e12403.


Banos, A. (2013).
Pour des pratiques de modélisation et de simulation libérées en géographies et shs.
HDR. Université Paris, 1.


Banos, A. (2017).
Knowledge accelerator' in geography and social sciences: Further and faster, but also deeper and wider.
In *Urban Dynamics and Simulation Models*, pages 119–123. Springer.


Behnisch, M. and Meinel, G. (2018).
Trends in Spatial Analysis and Modelling.
Springer.

References II


Perez, P., Banos, A., and Pettit, C. (2016).
Agent-based modelling for urban planning current limitations and future trends.
In *International Workshop on Agent Based Modelling of Urban Systems*, pages 60–69. Springer.