Models of growth for system of cities : Back to the simple

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Modeling Urban Growth

Spatial Interaction and Urban Growth

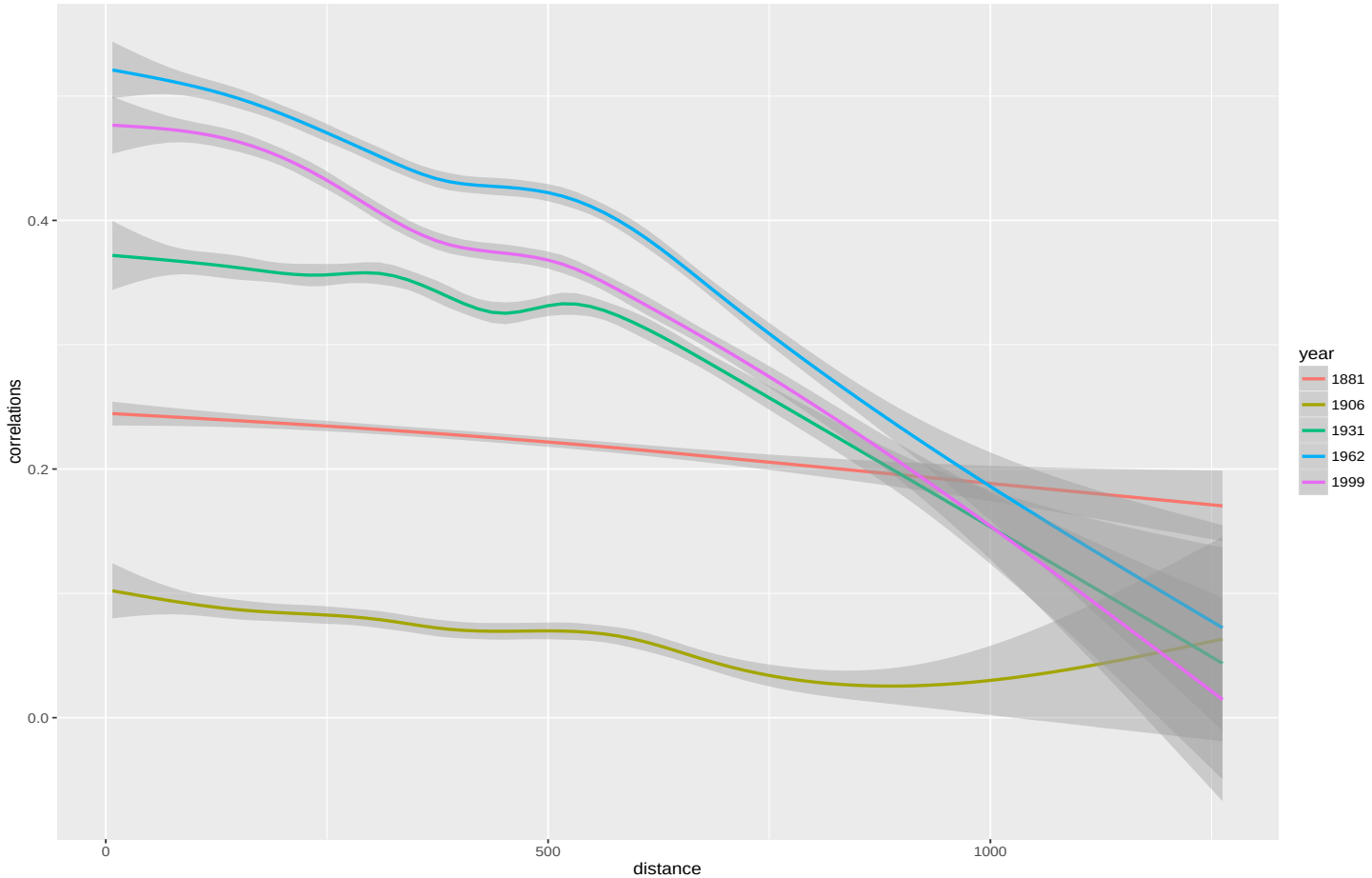
Research Objective

Model Rationale

Model Formulation

Data : stylized facts

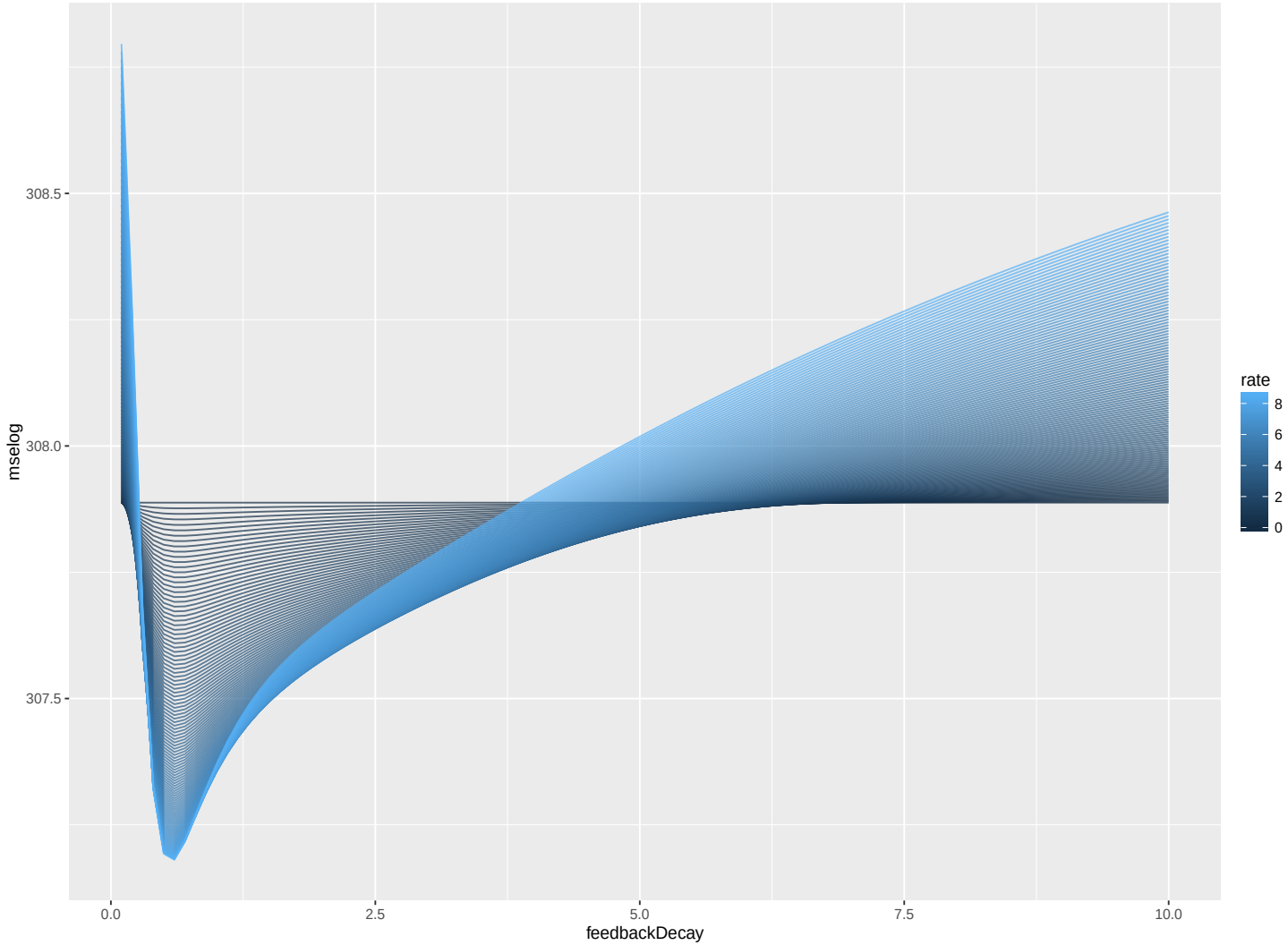
Population data for French-cities (Pumain-INED database)



Data : geographic abstract network

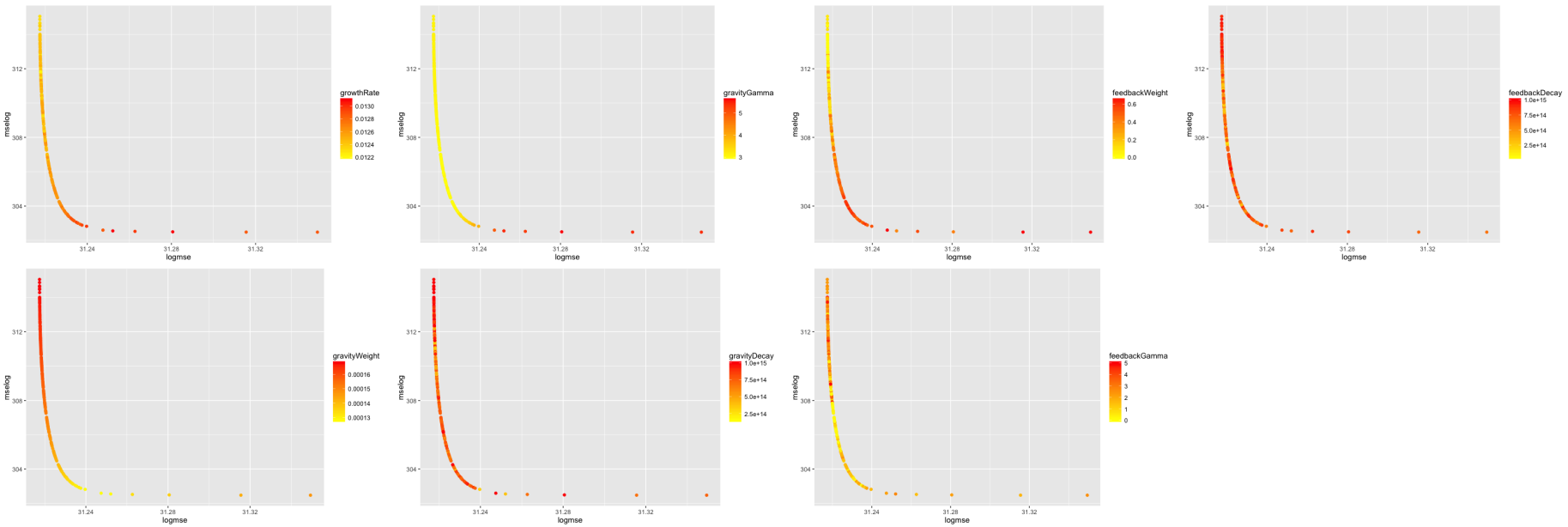
Results : model exploration

Evidence of physical network effects

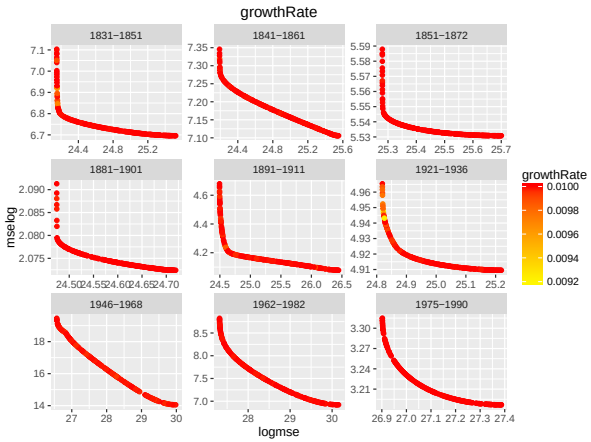


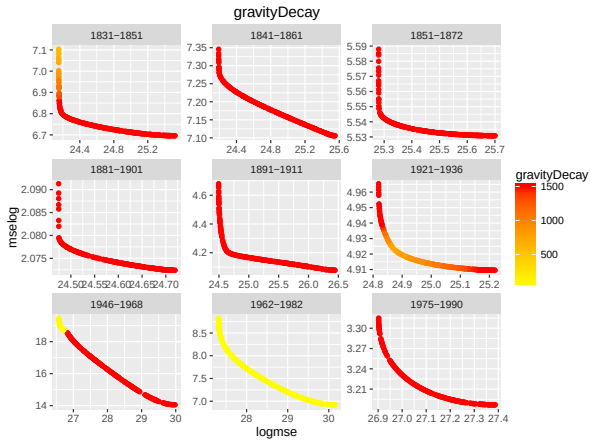
Results : model calibration

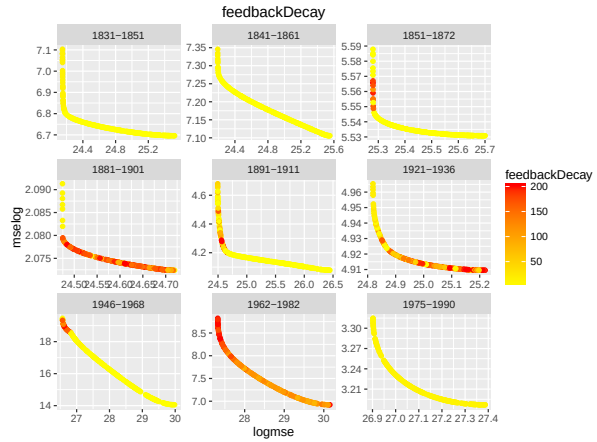
Model calibration using GA on computation grid, with software `OpenMole` [Reuillon et al., 2013]

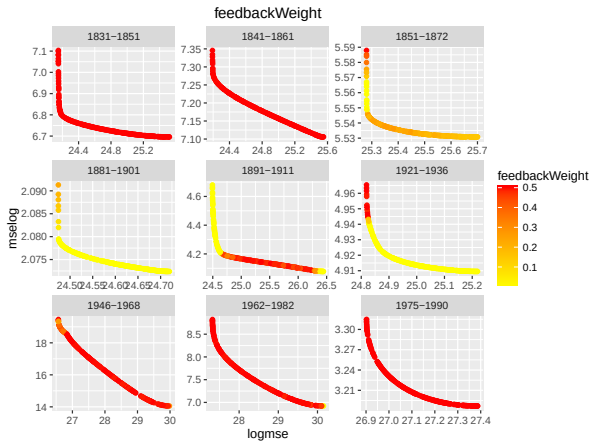


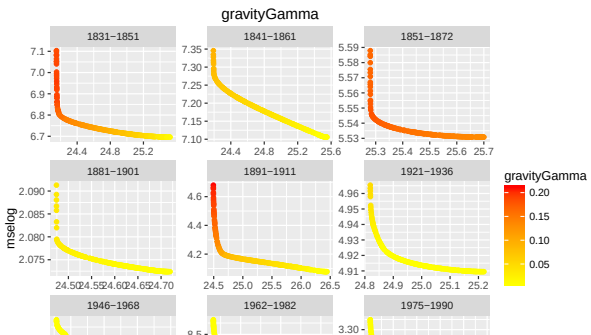
Results : non-stationary model calibration

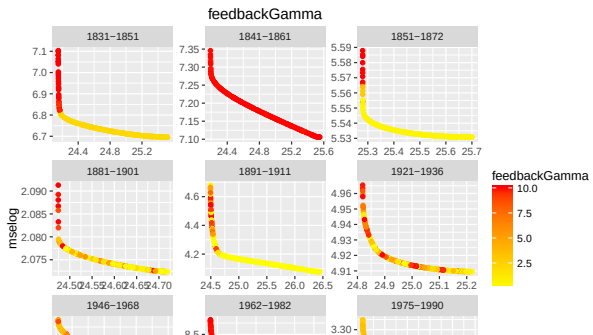












Quantifying overfitting

Not clear nor well theorized how to deal with overfitting in models of simulation

Intuitive idea : Approximate gain of information by approaching models of simulation by statistical models

Empirical AIC

Discussion

Conclusion

- All code available at
`https://github.com/JusteRaimbault/CityNetwork/tree/master/Models/NetworkNe`

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Reserve Slides

References I

Reuillon, R., Leclaire, M., and Rey-Coyrehourcq, S. (2013).
Openmole, a workflow engine specifically tailored for the distributed exploration of simulation models.
Future Generation Computer Systems, 29(8):1981–1990.