Dr. Juste Raimbault

LASTIG, IGN
73, avenue de Paris
94165 Saint-Mandé, France

✆ *+33648136295*
✉ *juste.raimbault@ign.fr*
ORCID : 0000-0003-0768-9480

Positions

Since Jan. 2022	***Chargé de Recherche du Développement Durable***, *LASTIG, IGN*, Saint-Mandé, France. *Validation of spatial simulation models, Land-use transport interactions, Urban morphogenesis*
Apr. 2021–Dec. 2021	**Research Fellow**, *Institute for Global Prosperity, UCL*, London, UK. *Agent-based modeling informal job markets in Lebanon*
Jan. 2019–Oct. 2021	**Research Fellow**, *CASA, UCL*, London, UK. *Coupling land-use transport interaction models with microsimulation models, Scientific workflow systems and modular transport models*
Mar. 2018–Aug. 2019	**Post-doctoral Researcher**, *Complex Systems Institute - UPS CNRS 3611 ISC-PIF*, Paris, France. *Extending methods to explore spatial simulation models*
Feb. 2015–Feb. 2018	***Doctorant Contractuel chargé d'enseignement***, *Université Paris 7 Denis Diderot, UFR GHSS*, Paris, France.
Sep. 2014–Jan. 2015	**Researcher**, *L2 Technologies*, Paris, France. *Machine learning and complex network analysis for real-time trend detection in financial data*
Sep. 2010–Aug. 2014	***Elève Officier***, *Ecole Polytechnique*, Palaiseau, France.

Education

Feb. 2015–Feb. 2018	**PhD in Geography**, *Géographie-cités (UMR 8504 CNRS) / LVMT (UMR-T 9403 IFSTTAR)*. Characterizing and Modeling the Co-evolution of Transportation Networks and Territories
June 2016	**SFI Complex Systems Summer School**, *Santa Fe Institute*.
2012–2014	**MSc Complex Systems Science**, *Ecole Polytechnique (Ingénieur Diplômé)*.
2013–2014	**MSc Urbanism, Environment, Transportation**, *Ecole Nationale des Ponts et Chaussées*.
2010–2012	**BSc**, *Ecole Polytechnique*.
2007–2010	**CPGE**, *Lycée Henri IV*, Paris, France.

Journal papers

Raimbault, J. & Le Néchet, F. (2021). Introducing endogenous transport provision in a LUTI model to explore polycentric governance systems. *Journal of Transport Geography*, 94, 103115. DOI:10.1016/j.jtrangeo.2021.103115

Raimbault J., Denis E., Pumain D. (2020). Empowering Urban Governance through Urban Science: Multi-Scale Dynamics of Urban Systems Worldwide. *Sustainability*, 12, 5954. DOI:10.3390/su12155954

Raimbault J., Broere J., Somveille M., Serna J.M., Strombom E. Moore C., Sugar L., Zhu B. (2020). A spatial agent based model for simulating and optimizing networked eco-industrial systems. *Resources Conservation and Recycling*, 155, 104538. DOI:10.1016/j.resconrec.2019.104538

Bergeaud, A. & Raimbault, J. (2020). An Empirical Analysis of the Spatial Variability of Fuel Prices in the United States. *Transportation Research Part A: Policy and Practice*, 132, 131-143. DOI:10.1016/j.tra.2019.10.016

Raimbault, J. (2020). Indirect evidence of network effects in a system of cities. *Environment and Planning B: Urban Analytics and City Science*, 47(1), 138-155. DOI:10.1177/2399808318774335

Raimbault, J. (2019). Second-order Control of Complex Systems with Correlated Synthetic Data. *Complex Adaptive Systems Modeling*, 7(4). DOI:10.1186/s40294-019-0065-y

Raimbault, J. (2019). Multi-dimensional Urban Network Percolation. *Journal of Interdisciplinary Methodologies and Issues in Science*, 5(5). DOI:110.18713/JIMIS-180719-5-5

Raimbault J., Cottineau C., Le Texier M., Le Nechet F. & Reuillon R. (2019). Space Matters: extending sensitivity analysis to initial spatial conditions in geosimulation models. *Journal of Artificial Societies and Social Simulation*, 22(4), 10. DOI:10.18564/jasss.4136

Raimbault J., Chasset P.-O., Cottineau C., Commenges A., Kosmopoulos C., Pumain D. & Banos A. (2019). Empowering open science with reflexive and spatialised indicators. *Environment and Planning B: Urban Analytics and City Science,* 2399808319870816. DOI:10.1177/2399808319870816

Raimbault, J. (2019). Exploration of an interdisciplinary scientific landscape. *Scientometrics*, 119(2), 617-641. DOI:10.1007/s11192-019-03090-3

Raimbault, J. (2018). Calibration of a density-based model of urban morphogenesis. *PloS one*, 13(9), e0203516. DOI:10.1371/journal.pone.0203516

Bergeaud, A., Potiron, Y., & Raimbault, J. (2017). Classifying patents based on their semantic content. *PloS one*, 12(4), e0176310. DOI:10.1371/journal.pone.0176310

Book chapters

Raimbault, J. & Pumain, D. (2021). Spatial dynamics of complex urban systems within an evolutionary theory frame, forthcoming in *Handbook Entropy, Complexity, Spatial Dynamics: The rebirth of theory, Reggiani, A., ed., Edward Elgar.* arXiv:2010.1489

Raimbault, J. (2021). Hierarchy and co-evolution processes in urban systems, forthcoming in *Centralities and Hierarchy of Networks and Territories, Fen-Chong J., ed., ISTE Editions.* arXiv:2001.11989

Raimbault, J. (2021). Modeling the co-evolution of cities and networks. In *Rozenblat C., Neal Z. (eds.), Handbook on Cities and Networks (pp. 166–193).* Edward Elgar. DOI:10.4337/9781788114714

Pumain D., & Raimbault J. (2020) Perspectives on Urban Theories. In *Pumain D. (ed.), Theories and Models of Urbanization (pp. 303-330). Lecture Notes in Morphogenesis.* Springer, Cham. DOI:10.1007/978-3-030-36656-8__16

Raimbault, J. (2020). Unveiling co-evolutionary patterns in systems of cities : systematic exploration of the SimpopNet model. In *Pumain D. (ed.), Theories and Models of Urbanization (pp. 261-278). Lecture Notes in Morphogenesis.* Springer, Cham. DOI:10.1007/978-3-030-36656-8_14

Raimbault, J. (2020). Relating complexities for the reflexive study of complex systems. In *Pumain D. (ed.), Theories and Models of Urbanization (pp. 27-41). Lecture Notes in Morphogenesis.* Springer, Cham. DOI:10.1007/978-3-030-36656-8_3

Raimbault, J., & Pumain, D. (2019). Methods for Exploring Simulation Models. In *Pumain D. (ed.), Geographical Modeling (pp. 125-150).* Wiley Online Library. DOI:10.1002/9781119687290.ch5

Raimbault, J. (2019). An urban morphogenesis model capturing interactions between networks and territories. In *D'Acci L. (ed.), The Mathematics of Urban Morphology (pp. 383-409).* Birkhauser, Cham. DOI:10.1007/978-3-030-12381-9_17

Raimbault, J. (2019). Evolving accessibility landscapes: mutations of transportation networks in China. In *Aveline N. (ed.), Pathways of Sustainable Development across China: the Cases of Hangzhou, Datong and Zhuhai (pp. 89-108).* Imago Editor, ISBN:978-88-94384-71-0

Conference papers

Nacer-Weill A., Yang C., Barbet T. & Raimbault J. (2021). An agent-based model for modal shift in public transport. *Transportation Research Procedia, EWGT2021.* arXiv:2107.11399

Raimbault, J. (2021). Integrating and validating urban simulation models. *French Regional Conference on Complex Systems 2021.* arXiv:2105.13490

Raimbault, J. & Batty., M. (2021). Estimating public transport congestion in UK urban areas with open transport models. *GISRUK 2021 Proceedings.* DOI:10.5281/zenodo.4670012

Raimbault, J. (2020). A model of urban evolution based on innovation diffusion. *The 2020 Conference on Artificial Life.* DOI:10.1162/isal_a_00283

Raimbault, J., Perret, J. & Reuillon, R. (2020). A scala library for spatial sensitivity analysis. *GISRUK 2020 Proceedings.* arXiv:2007.10667 ; Editor

Raimbault, J. & Perret, J. (2019). Generating urban morphologies at large scales. *The 2019 Conference on Artificial Life 2019 NO. 31*, 179-186. DOI:10.1162/isal_a_00159

Raimbault, J. (2017). An applied knowledge framework to study complex systems, *Complex Systems Design & Management* (pp.31-45). arXiv:1706.09244

Raimbault, J. (2017). Identification de causalités dans des données spatio-temporelles, Sageo 2017 Proceedings. arXiv:1709.08684 (English translation)

Raimbault, J. (2017). A Discrepancy-Based Framework to Compare Robustness Between Multi-attribute Evaluations. In *Complex Systems Design & Management* (pp. 141-154), Springer. DOI:10.1007/978-3-319-49103-5_11

Raimbault, J. (2017). Investigating the empirical existence of static user equilibrium. *Transportation Research Procedia*, 22, 450-458. DOI:10.1016/j.trpro.2017.03.053

Raimbault, J. (2017). Models coupling urban growth and transportation network growth: An algorithmic systematic review approach. *Plurimondi*, (17), *ECTQG 2015 Proceedings*. ISSN:2420-921X

Raimbault, J. (2014). User-Based Solutions for Increasing Level of Service in Bike-Sharing Transportation Systems. In *Complex Systems Design & Management* (pp. 31-44), Springer. DOI:10.1007/978-3-319-11617-4_3 ***Best Student Paper Award at CSDM 2014.***

Raimbault, J., Banos, A. & Doursat, R. (2014) A Hybrid Network/Grid Model of Urban Morphogenesis and Optimization. *Proceedings of the 4th International Conference on Complex Systems and Applications* (ICCSA 2014), June 23-26, 2014, Université de Normandie, Le Havre, France; M. A. Aziz-Alaoui, C. Bertelle, X. Z. Liu, D. Olivier, eds.: pp. 51-60. arXiv:1612.08552 ; Editor

Communications

Raimbault J., Broere J., Somveille M., Serna J.M., Strombom E. Moore C., Sugar L. & Zhu B. (2021). Agent-based models of industrial symbiosis networks. *Future Days 2021, Paris, November 2021.*

Morphogenesis, evolution and co-evolution of cities, Poster at *Conference on Complex Systems 2021, Lyon, October 2021.*

Building simulation models coupling territorial and network dynamics at the interface of disciplines and scales, *Spatial Data Science, Lausanne, June 2021.*

Raimbault J. & Batty M. (2021). Building and validating modular urban transportation models using scientific workflow systems, *Applied Urban Modeling Global Workshop, Cambridge, Jan. 2021.*

A co-evolution agent-based model for systems of cities and transportation networks integrating top-down governance through game theory, *Conference on Complex Systems 2020, Dec. 2020.* DOI:10.5281/zenodo.4419177

Raimbault J. & Zdanowska N. (2020). A generative model for urban firm networks, *NetSci 2020, Rome, Sept 2020.*

Worldwide estimation of parameters for a simple reaction-diffusion model of urban growth, *International Land-use Symposium 2019, Paris, Dec 2019.* HAL:halshs-02406539

A multi-scalar model for systems of cities, *Conference on Complex Systems 2019, Singapore, Oct. 2019.* HAL:halshs-02351722

A meta-analysis of models for interactions between transportation networks and territories. *European Colloquium on Theoretical and Quantitative Geography, Mondorf, Luxembourg, Sep 2019.* HAL:halshs-02284848

Raimbault J., Denis E., Pumain D. (2019). An evolutionary theory for the spatial dynamics of urban systems worldwide. *European Colloquium on Theoretical and Quantitative Geography, Mondorf, Luxembourg, Sep 2019.* HAL:halshs-02284897

Vanhoof M., Godoy-Lorite A., Murcio R., Iacopini I., Zdanowska N., Raimbault J., Milton R., Arcaute E., Batty M. (2019). Using Foursquare data to reveal spatial and temporal patterns in London. *NetMob 2019, Oxford, United Kingdom, Jul 2019.* HAL:halshs-02284843

De l'endogénéité des hiérarchies dans les systèmes territoriaux complexes. *Journée Des jeunes chercheurs de l'Institut de Géographie : Compter, classer, catégoriser, Paris, Apr. 2019.* HAL:halshs-02089520

Towards multi-scalar models for the co-evolution of transportation networks and territories. *Theo Quant 2019, Université de Franche-Comté, Besancon, Feb 2019.* HAL:halshs-02013006

Des systèmes naturels aux systèmes urbains: génération de réseaux de transport optimaux par modèle slime-mould, *poster at Biomim'expo 2018, Paris, Oct. 2018.* HAL:halshs-01904499

Raimbault, J. (2018). Modélisation des interactions entre réseaux de transport et territoires : une approche par la co-évolution. *Journée d'étude Pacte-Citeres, Grenoble, Nov. 2018.* HAL:halshs-01933916

A multi-dimensional percolation approach to characterize sustainable mega-city regions, *MARAMI 2018, Avignon, Oct. 2018.* HAL:halshs-01898864

A systematic comparison of interaction models for systems of cities, *Conference on Complex Systems 2018, Thessaloniki, Sept. 2018.* HAL:halshs-01880492

Extracting knowledge from simulation models: trends and perspectives from the viewpoint of quantitative geography, *Conference on Complex Systems 2018, Thessaloniki, Sept. 2018.* HAL:halshs-01882389

Multi-modeling the morphogenesis of transportation networks. In *Artificial Life Conference Proceedings (pp. 382-383). Tokyo, July 2018.* DOI:10.1162/isal_a_00073

Modeling Urban Morphogenesis: towards an integration of territories and networks, *GoPro 2017, Lyon, Dec. 2017.* HAL:hal-01808480

Complexity, Complexities and Complex Knowledge, *Geodivercity International Workshop, Paris, October 2017.* HAL:halshs-01632331

Modeling the Co-evolution of Urban Form and Transportation Networks, *Conference on Complex Systems 2017, Cancun, Sept. 2017.* HAL:halshs-01590624

Raimbault J. & Baffi S. (2017). Structural Segregation: Assessing the impact of South African Apartheid on Underlying Dynamics of Interactions between Networks and Territories, *ECTQG 2017, York, Sept. 2017* HAL:halshs-01584914

Invisible Bridges ? Scientific landscapes around similar objects studied from Economics and Geography perspectives, *ECTQG 2017, York, Sept. 2017* HAL:halshs-01584894

Raimbault, J. & Bergeaud, A. (2017). The Cost of Transportation: Spatial Analysis of Fuel Prices in the US, *EWGT 2017, Budapest, Sept. 2017* HAL:halshs-01582909

Cottineau C., Raimbault J., Le Texier M., Le Néchet F. & Reuillon R. (2017). Initial spatial conditions in simulation models: the missing leg of sensitivity analyses?, *Geocomputation 2017, Leeds, Sept. 2017* HAL:halshs-01841272

A macro-scale model of co-evolution for cities and transportation networks, *Medium International Conference, Guangzhou, June 2017* HAL:halshs-01863229

Losavio C. & Raimbault J. (2017). Agent-based Modeling of Migrant Workers Residential Dynamics within a Mega-city Region: the Case of Pearl River Delta, China, *Urban China Development International Conference, London, May 2017* HAL:halshs-01666887

Co-construire Modèles, Etudes Empiriques et Théories en Géographie Théorique et Quantitative: le cas des Interactions entre Réseaux et Territoires. *Treizièmes Rencontres de ThéoQuant, Besançon, May 2017* HAL:halshs-01525448

Un Cadre de Connaissances pour une Géographie Intégrée. *Journée des jeunes chercheurs de l'Institut de Géographie de Paris, Paris, April 2017* HAL:halshs-01505084

Towards a Theory of Co-evolutive Networked Territorial Systems: Insights from Transportation Governance Modeling in Pearl River Delta, China. *Medium Seminar-Urban Sustainable Development in Zhuhai, Guangzhou, December 2016* HAL:halshs-01422484

Models of growth for system of cities : Back to the simple, *Conference on Complex Systems 2016, Amsterdam, Sep 2016.* HAL:halshs-01370274

Raimbault J., Bergeaud A. and Potiron Y. (2016). Investigating Patterns of Technological Innovation. *Conference on Complex Systems 2016, Amsterdam, Sep 2016.* HAL:halshs-01370528

For a Cautious Use of Big Data and Computation. *Royal Geographical Society - Annual Conference 2016 - Session : Geocomputation, the Next 20 Years (1), London, Aug 2016.* HAL:halshs-01358440

Indirect Bibliometrics by Complex Network Analysis. *20e Anniversaire de Cybergeo, Paris, May 2016.* HAL:halshs-01328058

Raimbault, J. & Serra, H. (2016). Game-based Tools as Media to Transmit Freshwater Ecology Concepts, *poster corner at SETAC 2016, Nantes, May 2016.* HAL:halshs-01322860

Raimbault, J. (2016). Génération de données Synthétiques corrélées, *Actes des Journées de Rochebrune, January 2016.* HAL:halshs-01514415

Le Nechet, F. & Raimbault, J. (2015). Modeling the emergence of metropolitan transport authority in a polycentric urban region, *ECTQG 2015, Bari, Sept. 2015.* HAL:halshs-01272236

Hybrid Modeling of a Bike-Sharing Transportation System, *poster at ICCSS 2015, Helsinki, June 2015.* HAL:halshs-01330627

Raimbault, J. & Gonzales, J. (2015). Application de la Morphogénèse de Réseaux Biologiques à la Conception Optimale d'Infrastructures de Transport, *poster presented at Rencontres du Labex Dynamite, Paris, May 2015.* HAL:halshs-01860296

Working Papers

Raimbault, J. (2020). A systematic review and meta-analysis of models coupling transportation networks with territories. arXiv:2012.13367

Raimbault, J. (2020). A comparison of simple models for urban morphogenesis. arXiv:2008.13277

Raimbault, J., Zdanowska, N. & Arcaute, E. (2020). Modeling growth of urban firm networks. arXiv:2009.05528

Raimbault, J. (2020). An agent-based model of interdisciplinary interactions in science. arXiv:2006.16399

Raimbault, J. (2020). Cities as they could be: Artificial Life and Urban Systems. arXiv:2002.12926

Raimbault, J. (2019). Space and complexities of territorial systems. arXiv:1901.09869

Raimbault, J. (2019). Modeling interactions between transportation networks and territories: a co-evolution approach. arXiv:1902.04802

Raimbault, J. (2018). Co-evolution and morphogenetic systems. arXiv:1803.11457

Raimbault, J. (2018). Reconciling complexities: for a stronger integration of approaches to socio-technical systems. arXiv:1805.10195

Grants and Awards

MITI CNRS projects on climate change (LIMMS, MJF, ISC-PIF collaboration), 30k€(2021-2022)

DAFNI UKCRIC Champion grant, Research fellow grant, 39k GBP (2020-2021) (`https://dafni.ac.uk/dafni-champions-2-2/`)

MEDIUM mobility grant, Young Researcher mobility grant for China, MEDIUM project (2016-2017).

PhD grant, *allocation doctorale AMX* for three years from Graduate School, Ecole Polytechnique (2015-2018).

Best Student Paper Award at Conference CSD&M, Paris, December 2014.

Teaching

June 2021	ExModelo summer school on simulation models - III
Spring 2021	Master thesis supervision (2 students), Smart Cities and Urban Analytics Msc and MRes, UCL
Sept. 2020	ExModelo summer school on simulation models - II
Spring 2020	Master thesis supervision (2 students), Smart Cities and Urban Analytics Msc, UCL
Feb. 2020	**Teaching Assistant (5h)**, *UCL*, Urban Simulation.
June 2019	ExModelo summer school on simulation models, organized by ISC-PIF and OpenMOLE team
2018/2019	**Lecture Modeling mobility (4x3h)**, *Ecole des Ponts et Chaussées*, Champs-sur-Marne.
2018	**Lecture big data in transportation studies (2x2h)**, *Ecole des Ponts et Chaussées*, Champs-sur-Marne.
Spring 2017	**Teaching Assistant (64h)**, *Université Paris 7*, Paris, France. Teaching Assistant: *Statistics and Cartography*, *Spatial Analysis* and *Professionalization for Geographers*.
Feb. 2016	**Lecture Geography and Big Data (3h)**, *Université Paris 1 Sorbonne*, Paris, France.
Fall 2015	**Teaching Assistant (64h)**, *Université Paris 7*, Paris, France. Teaching Assistant: *Introduction to Geography* and *Introduction to GIS*.

Reviewing

Since 2020	Topic editor for Land (ISSN 2073-445X)
2020	Member of the program committee of the ACM SIGSIM PADS Conference
since 2019	Reviewing for *Scientific Reports* (1), *Sustainability* (6), *International Journal of Geographical Information* (1), *Environment and Planning B* (1), *Scientometrics* (3), *Energies* (1), *Applied Spatial Analysis and Policy* (1)
since 2018	Reviewing for *Ecological Modeling* (1), *Entropy* (1)
since 2017	Reviewing for *PLoS ONE* (4)
since 2015	Reviewing for *Cybergeo* (14)

Scientific Activity

Nov. 2021	ECTQG 2021. Special session organisation: *Exploration and validation of spatial simulation models*
Oct. 2019	CCS 2019. Satellite organisation: *New methods and epistemologies to explore simulation models - II*
Sept. 2019	ECTQG 2019. Special session organisation: *Geosimulation models exploration methods*
2018	Participation in the CNRS experimental project "*Incubator for scientific mediation*"
Sept. 2018	CCS 2018. Satellite organisation: *New methods and epistemologies to explore simulation models*
Sept. 2017	ECTQG 2017. Session organisation: *Bridges between Economics and Geography*
June 2017	Medium Conference 2017. Session organisation: *Spatio-temporal Behavior in Complex Urban Systems*

Computer skills

OS	Unix (OSX, Ubuntu, CentOS)	Scripts	Shell, AppleScript
Programming	Java, Python, Scala, C/C++, OCaml	Typography	LaTeX, API OO.org, ScalaTex
Web	php, XHTML, CSS, AJAX	Database	MySQL, MongoDB, PostgreSQL
Scientific	R, NetLogo, Gama, OpenMole, Scilab, Matlab, Gephi	GIS	QGIS, PostGIS, TransCAD, Ocad

Languages

French, *Native*	**English**, *Fluent*
German, *Fluent, European Baccalaureate*	**Mandarin**, *Notions, level HSK3*