

Edith Gabriel | Curriculum vitae

Laboratory of Mathematics, Avignon University, France
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Born: 21th August 1977, Marseille, France - 2 children

Career

- Since 2018** **Department head** of the department Statistics and Decision Support Systems, Institute of Technology, Avignon University, France.
- 2017 - 2018** **Course co-director** of the department Statistics and Decision Support Systems, Institute of Technology, Avignon University, France.
- 2014 – 2017** **Long term visitor**, INRA, Biostatistics and spatial processes unit.
- 2013 – 2014** **Department head** of the department Statistics and Decision Support Systems, Institute of Technology, Avignon University, France.
- 2008 – 2012** **Course director** of the department Statistics and Decision Support Systems, Institute of Technology, Avignon University, France.
- Since 2007** **Senior lecturer in Statistics**, Avignon University, France.
- 2005 – 2007** **Research Associate**, Department of Mathematics and Statistics, Lancaster University, UK.
- 2004 – 2005** **Lecturer in Statistics**, Montpellier University.
- 2001 – 2004** **D. Phil.**, Biostatistics and spatial processes unit, INRA, Avignon, France
- 2001 – 2004** **Lecturer in Statistics**, IUP Avignon, France.

University degrees, Awards

- 2014 – 2017** **Long term visitor**, INRA, Biostatistics and spatial processes unit.
- 2014** **Habilitation Thesis**, Avignon University, France.
Title: « *Understanding and modelling spatial and spatio-temporal stochastic processes* » Defended on 9th December 2014. Jury: A. Bar-Hen (rap.), L. Bel (prés.), J-F. Cœurjolly (exam.), M. Genton (rap.), C. Lantuéjoul (exam.), R. Senoussi (exam.) and C. Thomas-Agnan (rap.).
- 2010 – 2014** Four years bonus Awards of Scientific Excellence.
- 2006** Marie-Jeanne Laurent-Duhamel prize of the French Statistical Society.
- 2004** **Ph.D by Thesis**, Detecting zones of abrupt change in spatial data and applications to precision agriculture, Montpellier University, France.
- 2001** Master of Statistics, Montpellier University, France.
- 1999** Bachelor of Mathematics, Montpellier University, France.

Scientific activities

Scientific committees (SC) and organizing committees (OC)

- Journées de Statistique de la SFdS 2017 (treasurer, OC)
- International Society for Non-Parametric Statistics Conference 2016 (OC)
- Spatial Accuracy conference 2016 (PC)
- Spatial Statistics conference 2015 (SC + OC).
- Workshop on Stochastic Weather Generators 2014 (OC).
- Workshop on Spatial Statistics and Image Analysis in Biology (SSIAB) since 2013 (SC).
- Avignon-Marseille statistics seminar 2013 - 2015 (SC + OC).
- Workshop SSIAB 2012 (OC).
- STID-SFdS days 2010 - 2014 (SC + OC).
- Statistics seminar of the LMA 2009 – 2014 (SC + OC).

Research projects

- CESAB Project disoweed 2016-2018.
- ANR AgrobioSE 2014-2018.
- ANR ROLSES 2009-2013.
- Veterinary Training and Research Initiative 2005-2009.

Leader of the research axis “modelling” of the federative research structure Tersys since 2017.

Member of the National Council of Universities, Applied Mathematics section since 2014.

Alternate member of Scientific committee: INRA MIA department, since 2016.

Member of Board: Avignon Institute of Technology, 2008 - 2012.

Member of Scientific committee: Avignon Institute of Technology, 2007 – 2009.

Member of editorial board: *Spatial Statistics* since 2015.

Reviewer for *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society Series A and B*, *Computational Statistics and Data Analysis*, *Journal of Statistical Software*, *Statistica Neerlandica*, *Scandinavian Journal of Statistics*, *Methodology and Computing in Applied Probability*, *Spatial Statistics*, *Mathematical Geoscience*, *Papers in Applied Geography*, *R Journal*, *Metron*, *BioMed Central*, *Stat and Les annales de l'ISUP*.

Research student supervision

- PhD.: M. Raesi since 2018, S. Kharbach, 2015-2018, M. El Asri 2010 – 2014
- MPhil: M. Raesi (2018), S. Kharbach (2015).
- MSc: K. Agboto (2015), N. Van Wymeersch (2015).
- ENSAI : Y. Esposito (2014).
- HND: S. Berthlot (2015), C. Boetti (2014), C. Nougier (2014), J. Perez (2014).

R package: stpp (development and maintenance)

Publications

Papers in Journals and Book chapters

- [1] Toffin E., **Gabriel E.**, Louis M., Deneubourg J-L., Grégoire J-C. (2018) Colonization of weakened trees by mass attacking bark beetles: no penalty for pioneers, scattered initial distributions and final regular patterns. *Scientific Reports*, 5(1): 170454.
- [2] **Gabriel E.**, Coville J., Chadoeuf J. (2017) Estimating the intensity function of spatial point processes outside the observation window. *Spatial Statistics*, 22(2), 225--239.
- [3] **Gabriel E.**, Opitz T., Bonneau F. (2017) Detecting and modeling multi-scale space-time structures: the case of wildfire occurrences. *Journal de la Société Française de Statistique*, 158(3), 86--10
- [4] RESSTE Network (2017) Analyzing spatio-temporal data with R: Everything you always wanted to know – but were afraid to ask. *Journal de la Société Française de Statistique*, 158(3), 124--158.
- [5] **Gabriel E.** (2017) Book Review: A. Baddeley, E. Rubak, R. Turner. Spatial Point Patterns: Methodology and Applications with R. *Mathematical Geosciences*, 49(6), 815--817.
- [6] **Gabriel E.**, Bonneau F., Monestiez P., Chadœuf J. (2016) Adapted kriging to predict the intensity of partially observed point process data. *Spatial Statistics*, 18, 54--71.
- [7] Gaba S., **Gabriel E.**, Chadoeuf J., Bonneau F., Bretagnolle V. (2016) Herbicides do not ensure for higher wheat yield, but eliminate rare plant species. *Scientific Reports*, 6, 1--10.
- [8] **Gabriel E.** (2016) Spatio-temporal point pattern analysis and modelling. *Encyclopedia of GIS, 2nd Edition*. El Asri M., Blanke D., **Gabriel E.** (2016) Weighted M-estimators for multivariate clustered data. *Statistics and Probability Letters*, 112, 26--34.

- [9] **Gabriel E.** (2014) Estimating second-order characteristics of inhomogeneous spatio-temporal point process: influence of edge correction methods and intensity estimates. *Methodology and Computing in Applied Probability*, 16(1), 411--431.
- [10] **Gabriel E.**, Rowlingson B., Diggle P. (2013) stpp: An R package for plotting, simulating and analysing Spatio-Temporal Point Patterns. *Journal of Statistical Software*, 53(2), 1--29.
- [11] Blanke D., **Gabriel E.**, Josselin D. (2012). Comparing new adaptive and robust estimators of location. *Les annales de l'ISUP*, 56, 65--86.
- [12] **Gabriel E.**, Allard D., Bacro J-N. (2011) Estimating and testing Zones of Abrupt Change for spatial data. *Statistics and Computing*, 21, 107-120.
- [13] Diggle P., **Gabriel E.** (2010) Spatio-temporal point processes. *Handbook of Spatial Statistics*. Chapman and Hall/CRC Handbooks of Modern Statistical Methods, pp 449-461.
- [14] **Gabriel E.**, Wilson D., Leatherbarrow H., Cheesbrough J., Gee S., Bolton E., Fox A., Fearnhead P., Hart A., Diggle P. (2010) Spatio-temporal epidemiology of *Campylobacter jejuni* enteritis, in an area of Northwest England, 2000-2002. *Epidemiology and Infection*, 138, 1384-1390.
- [15] **Gabriel E.**, Diggle P. (2009) Second-order analysis of inhomogeneous spatio-temporal point process data. *Statistica Neerlandica*, 63, 43-51.
- [16] Wilson D., **Gabriel E.**, Leatherbarrow A., Cheesbrough J., Gee S., Bolton E., Fox A., Hart A., Diggle P., Fearnhead P. (2009) Rapid evolution and the importance of recombination to the gastro-enteric pathogen *Campylobacter jejuni*. *Molecular Biology and Evolution*, 26(2), 385-397.
- [17] Wilson D, **Gabriel E.**, Leatherbarrow A., Cheesbrough J, Gee S., Bolton E., Fox A., Fearnhead P., Diggle P. (2008) Tracing the source of Campylobacteriosis. *PLoS Genetics*, 4(9):e1000203.
- [18] **Gabriel E.**, Allard D. (2008) Evaluating the sampling pattern when detecting zones of abrupt change. *Environmental and Ecological Statistics*, 4, 469-489.
- [19] **Gabriel E.**, Allard D., Guérif M., Mary B. (2007) Detecting zones of abrupt change in soil data, with an application to an agricultural field. *European Journal of Soil Science*, 58, 1273-1284.
- [20] **Gabriel E.** (2007) Détection de changements abrupts dans le gradient d'un champ gaussien et application aux sciences de l'environnement. *Journal de la Société Française de Statistique et Revue de Statistique Appliquée*, 148, 3-28.
- [21] Allard D., **Gabriel E.** (2007) Détection de zones de changement abrupt pour des variables non permanentes : vers la définition de zones homogènes ? Dans *Agriculture de Précision*, Quae, Versailles, pp 165-176.

Papers in conference proceedings

- [17] **Gabriel E.**, Diggle P. (2009) Second-order analysis of the spatio-temporal distribution of human campylobacteriosis in Preston, Lancashire, Dans Atkinson, P.M., Lloyd, C.D. (Eds.). *geoENV VII, Geostatistics for Environmental Applications*, pp. 99-106.
- [18] **Gabriel E.**, Allard D. (2005) Assessing the power of zones of abrupt change test detection, *Seventh International Geostatistical Congress*, Banff, Canada, pp. 1103-1008, Kluwer Academic Publisher.
- [19] **Gabriel E.**, Allard D., Bacro J.N. (2004) Detecting zones of abrupt change: application to soil data, dans X. Sanchez-vila, J. Carrera and R. Froidevaux (Eds.) *geoENV IV Geostatistics for Environmental Applications*, pp. 437-448, Kluwer Academic Publisher

Misc

- [22] El Asri M., Blanke D., **Gabriel E.** (2014) Weighted M-estimators for multivariate clustered data: theory and simulation results. arXiv:1412.5136.
- [23] **Gabriel E.** (2014) Comprendre et modéliser des phénomènes stochastiques en statistique spatiale et spatio-temporelle. Mémoire d'Habilitation à Diriger des Recherches de l'Université d'Avignon et des Pays de Vaucluse (111 pages).

- [24] **Gabriel E.**, Bonneau F., Monestiez P., Chadœuf J. (2014) Predicting the local intensity of partially observed data from a revisited kriging for point processes. arXiv:1409.6441
- [25] **Gabriel E.** (2013) Estimating second-order characteristics of inhomogeneous spatio-temporal point processes: influence of edge correction methods and intensity estimates. <http://arxiv.org/abs/1304.7178>
- [26] Allard D., **Gabriel E.**, Bacro J.N (2005) Estimating and testing zones of abrupt changes for spatial data. *Research report n°2*, <http://ciam.inra.fr/biosp/RR2005>.
- [27] **Gabriel E.** (2004) Détection de zones de changement abrupt dans des données spatiales et application à l'agriculture de précision. Thèse de l'Université Montpellier II

Talks

Lectures and summer Schools

- [1] Gabriel E., Opitz T., Bonneau F. Detecting and modeling multi-scale space-time structures of wildfire occurrences. METMA IX, Workshop on spatio-temporal modelling, Montpellier, France, June 2018.
- [2] Allard D., Bel L., Gabriel E., Opitz T., Parent E. An introduction to geostatistical analysis of spatio-temporal data with R. METMA IX, Workshop on spatio-temporal modelling, Montpellier, France, June 2018.
- [3] Gabriel E., Opitz T. Spatio-temporal point processes: theory and practice. INRA, Avignon, March 2018.
- [4] Allard D., Bel L., Gabriel E., Opitz T., Parent E. An introduction to geostatistical analysis of spatio-temporal data with R. Workshop - Spatial Statistics Conference, Lancaster, England, July 2017.
- [5] Gabriel E. Spatio-temporal point process data: theory and practice. Ateliers Statistiques, Institut Henri Poincaré, Paris, November 2016.
- [6] Gabriel E. Space-time point process data: analysis and simulation using the R package stpp. GEOSTAT, Lancaster, UK, August 2015.

Conferences

- [7] Gabriel E., Opitz T., Bonneau F. Detecting and modeling multi-scale space-time structures of wildfire occurrences. METMA IX, Workshop on spatio-temporal modelling, Montpellier, France, June 2018.
- [8] Gabriel E. Estimating the intensity function of spatial point processes outside the observation window. Rencontres de Statistique, Marseille, France, June 2018 (**invited**).
- [9] Gabriel E., Opitz T., Bonneau F. Detecting and modeling multi-scale space-time structures of wildfire occurrences. Spatial Statistics Conference, Lancaster, England, July 2017.
- [10] Gabriel E., Saltré F., Chadœuf J., Bradshaw C. Allier géostatistique et algorithme EM pour cartographier la date d'apparition des hommes. xlixèmes Journées de Statistique, Avignon, France, May 2017.
- [11] Gabriel E., Chadœuf J. Geostatistics for point processes: predicting the intensity of ecological point process data. Journées MAS de la SMAI, Grenoble, France, June 2016 (**invited**).
- [12] Gabriel E., Chadœuf J. Geostatistics for point processes: predicting the intensity of partially observed point process data. METMA VIII, Workshop on spatio-temporal modelling, Valencia, Spain, June 2016.
- [13] Gabriel E., Chadœuf J. Geostatistics for point processes: predicting the intensity of partially observed point process data. *Stochastic Geometry and its Applications Conference*, Nantes, France, April 2016 (**invited**).
- [14] Gabriel E., Bonneau F., Monestiez P., Chadœuf J. Predicting the local intensity of partially observed data from a revisited kriging for point processes. *Spatial Statistics Conference*, Avignon, France, June 2015.
- [15] Gabriel E., Bonneau F., Monestiez P., Chadœuf J. Prédire l'intensité locale d'un processus ponctuel partiellement observé. xxxviièmes Journées de Statistique, Lille, France, June 2015.
- [16] Gabriel E., Bonneau F., Monestiez P., Chadœuf J. Prédire l'intensité locale d'un processus ponctuel partiellement observé : Application à l'estimation de la distribution d'espèces en écologie. *Congrès SMAI*, Les Karellis, France, June 2015 (**invited**)

- [17] Gabriel E., Chadoeuf J. Defining a variographic approach from the characteristics of a point process to estimate and predict the local intensity of partially observed data. *10th French-Danish Workshop on Spatial Statistics and Image Analysis in Biology*, Aalborg, Denmark, May 2014.
- [18] Gabriel E., Bonneau F. Modelling spatio-temporal patterns of forest fires. *10th French-Danish Workshop on Spatial Statistics and Image Analysis in Biology*, Aalborg, Denmark, May 2014.
- [19] Gabriel E. Spatio-temporal point process data: analysis and simulation. *11th European Congress of Stereology and Image Analysis*, Kaiserslautern, Germany, July 2013 **(invited)**.
- [20] Gabriel E. Processus ponctuels spatio-temporels : analyse et simulations. *xxxvèmes Journées de Statistique*, Toulouse, France, May 2013.
- [21] Gabriel E. Spatio-temporal point process data: analysis and simulation. *Spatial Statistics Conference*, Miami, USA, December 2012 **(invited)**.
- [22] Gabriel E. Représentation, analyse et simulation de processus ponctuels spatio-temporels. *1ères Rencontres R*, Bordeaux, France, July 2012
- [23] Gabriel E. Estimating second-order characteristics of spatio-temporal point processes. *7th International Conference on Stereology, Spatial Statistics and Stochastic Geometry*, Prague, Czech Republic, June 2012 **(invited)**.
- [24] Gabriel E. Introduction à la statistique spatiale. *xxxiièmes Journées de Statistique*, Marseille, France, May 2010. **(invited)**
- [25] Gabriel E., Diggle P. Second-order analysis of human campylobacteriosis. *7th European Conference on Geostatistics for Environmental Applications*, Southampton, England, September 2008.
- [26] Gabriel E., Diggle P. Analyse spatio-temporelle de données ponctuelles agrégées : application à l'épidémiologie. *xxxixèmes Journées de Statistique*, Angers, France, June 2007.
- [27] Gabriel E., Diggle P., Wilson D., Leatherbarrow H., Fox A. Spatio-temporal and genetic epidemiology of *Campylobacter jejuni* in Lancashire. *4th North West Microbiology meeting*, Manchester, England, June 2007.
- [28] Gabriel E., Diggle P. Variation spatio-temporelle des cas de campylobactériose dans le secteur de Preston, *Journées MAS de la SMAI*, Lille, France, September 2006.
- [16] Gabriel E. Détection de zones de changement abrupt dans des données spatiales. *xxxviiièmes Journées de Statistique*, Clamart, France, May 2006 **(invited)**
- [17] Gabriel E., Allard D. Estimating and testing zones of abrupt change for spatial data, *Séminaire Européen de Statistique - Statistics of Spatio-Temporal Systems*, Bernried, Germany, December 2004.
- [18] Gabriel E., Allard D. Assessing the power of zones of abrupt change test detection, *Seventh International Geostatistical Congress*, Banff, Canada, September 2004.
- [19] Gabriel E., Allard D. Detecting zones of abrupt change for spatial data, *5th French-Danish Workshop on Spatial Statistics and Image Analysis in Biology*, Saint Pierre de Chartreuse, France, May 2004.
- [20] Gabriel E., Allard D. Puissance d'un test de détection de zones de changement abrupt dans le plan, *xxxvièmes Journées de Statistique*, Montpellier, France, May 2004.
- [21] Gabriel E., Allard D., Bacro J.N. Detecting zones of abrupt change: application to soil data, *4th European Conference on Geostatistics for Environmental Applications*, Barcelone, Spain, November 2002.
- [22] Allard, D., Gabriel E., Bacro J.N. Détection de ruptures dans un champ gaussien : application à l'agriculture de précision, *xxxivèmes Journées de Statistique*, Nantes, France, May 2001.

Seminars

- [23] *Estimating the intensity function of spatial point processes outside the observation window*. Statistics Seminar, Toulouse School of Economics, Toulouse, France, June 2017.
- [24] *Analyzing spatio-temporal point processes*. Journées des Maths-Info de l'INRA, Mallemort, France, October 2016.
- [25] *Predicting the local intensity of partially observed data from a revisited kriging for point processes*. Sète, France, June 2015.

- [26] *Autour des processus ponctuels spatio-temporels*. Toulouse, France, January 2014.
- [27] *Analyse spatio-temporelle des cas de campylobactériose dans le secteur de Preston*. Bordeaux, March 2007.
- [28] *Détection de zones de changement abrupt dans des données spatiales*. Paris, France, March 2006.
- [29] *Spatio-temporal pattern of human Campylobacter isolates in the Preston area*. Leahurst, UK, January 2006.
- [30] *Détection de zones de changement abrupt dans des données spatiales*. Orsay, France, January 2005.
- [31] *Détection de zones de changement abrupt dans des données spatiales*. Toulouse, France, October 2004.
- [32] *Détection de zones de changement abrupt dans des données spatiales*. Montpellier, France, June 2004.
- [33] *Détection de zones de changement abrupt dans des données spatiales*. Grenoble, France, June 2004.
- [34] *Calcul de la puissance dans un test de détection de ruptures dans le plan*. Paris, France, July 2003.

Teaching and administrative activities

Department of Statistics and Decision Support Systems, Institute of Technology, Avignon University, France

- Head of department 2013 – 2014 and since 2018.
- Course director 2008 – 2012, 2017 - 2018.
- Responsible for HND Internships 2008 – 2012, 2017 - 2018.

Avignon University

- Pedagogical follow-up of about forty internships (HND).
- Teaching: (about 235 hours per year)