Europass Curriculum Vitae

Personal information

Surname(s) / First name(s)	**Cremaschi, Andrea**
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Nationality(-ies)	Italian
Date of birth	Nov 20 1987

Current Position

Aug 2019 – Now

PostDoc
Faculty of Science, Yale-NUS College, Singapore.

Previous Position

Oct 2016 – July 2019

PostDoc
Department of Cancer Immunology, Institute of Cancer Research, Oslo University Hospital, Oslo (Norway)

Oslo Centre for Biostatistics and Epidemiology, University of Oslo, Oslo (Norway)

Education

Sep 2012 – Sep 2016

Ph.D. in Statistics, School of Mathematics, Statistics and Actuarial Science (SMSAS), University of Kent, Canterbury, Kent (UK).
Supervisors: Prof. J. E. Griffin and Dr. A. Kume

Sep 2009 - Apr 2012

Master Degree in Mathematical Engineering (Laurea Magistrale in Ingegneria Matematica), Politecnico di Milano, Milan (Italy).
Dissertation: "*Model-based clustering via Bayesian nonparametric mixture models*"
Supervisors: Prof. A. Guglielmi and Dr. R. Argiento

Sep 2006 - Sep 2009

Bachelor Degree in Mathematical Engineering (Laurea Triennale in Ingegneria Matematica), Politecnico di Milano, Milan (Italy).
Dissertation: *"On the problem of dataset record-linkage: a probabilistic approach*"
Supervisors: Prof. A. M. Paganoni and Dr. F. Ieva

Sep 2001 - Sep 2006

Maturitá scientifica. Ist. Giuseppe Peano, Cinisello B.mo, Milan (Italy).

Research Interests

My research interests include both the methodological and applied aspects of Statistics, particularly within the Bayesian framework.
One of my main interests is Bayesian nonparametrics, and the use of flexible mixture models for inference in scenarios where the data present peculiar features. In my recent works, I focus on modelling data presenting deviation from Gaussianity and a sparse dependency structure, group-specific dependencies, as well as the flexible inclusion of general covariate types in the modelling framework.
The work I am conducting at Yale-NUS focuses on the implementation of advanced, often semi-parametric, Bayesian models to real-life data applications. In particular, I am interested in studying challenging datasets, involving mixed-type responses, covariates and time dynamics. The application of Bayesian nonparametric models to this challenging work is aimed at providing a more flexible fitting.
The three PostDoc years in Oslo have been pivotal in building my research interests. There, I have been able to learn a lot about Biostatistics and real-life data applications, and often had the possibility to participate by providing useful statistical insights to the study. In close collaboration with the Institute for Cancer Research, the Norwegian Centre for Molecular Medicine (NCMM), and the hospitals operating in cancer research, I focused on the analysis of dose-response data derived from cancer patients. In particular, my main project revolved around the study of drug-drug combination experiments, i.e. *in-vitro* assays in which multiple drugs are tested simultaneously. The aim of the (still ongoing) study is to quantify the differential effect emerging from such experiments via the specification of suitable statistical models.
Other research interests concern model-based cluster analysis, and the use of graphical models for inference in dataset characterised by a sparse dependency.

Publications and Conference Proceedings

R. Argiento, A. Cremaschi, M. Vannucci (2019). "Hierarchical Normalized Completely Random Measures to Cluster Grouped Data", *Journal of the American Statistical Association* (just accepted), 1-43.

A. Cremaschi, R. Argiento, K. Shoemaker, C. Peterson, M. Vannucci (2019). "Hierarchical Normalized Completely Random Measures for Robust Graphical Modeling", *Bayesian Analysis* (just accepted), 1-31.

A. Cadonna, A. Cremaschi, A. Guglielmi (2019). "Bayesian modeling for large spatio-temporal data: an application to mobile networks". Contributed paper to *SIS 2019 – Smart Statistics for Smart Applications*.

S. Skånland , A. Cremaschi, H. Bendiksen, J. U. Hermansen, D. Raj, L. A. Munthe, G. G. E. Tjønnfjord, K. Taskén (2019) "An in vitro assay for biomarker discovery and dose prediction applied to ibrutinib plus venetoclax treatment of CLL". *Leukemia* (just accepted).

A. Cremaschi (2018). "Stephen W. Looney, Joseph L. Hagan. Analysis of Biomarker Data: a Practical Guide". *Biometrical Journal* (book review).

I. K. Myhrvold, A. Cremaschi, J. U. Hermansen, G. E. Tjønnfjord, L. A. Munthe, K. Taskén, S. Skånland (2018). "Single cell profiling of phospho-protein levels in chronic lymphocytic leukemia". *Oncotarget*, 9(10), 9273-9284.

A. Cremaschi, J. E. Griffin (2016). "On the Study of Two Models for Integer-Valued High-Frequency Data", *Bayesian Statistics in Action - Proceedings of BAYESM 2016 Conference*, Springer.

J. Neufuss, T. Humle, A. Cremaschi, T. L. Kivell (2017). "Nut-cracking behaviour in wild-born, rehabilitated bonobos (Pan paniscus): a comprehensive study of hand-preference, hand grips and efficiency", *American Journal of Primatology* 79.2: e22589.

R. Argiento, A. Cremaschi, A. Guglielmi (2014). "A "Density-Based" Algorithm for Cluster Analysis Using Species Sampling Gaussian Mixture Models", *Journal of Computational and Graphical Statistics*, 23(4), 1126-1142. DOI: 10.1080/10618600.2013.856796.

R. Argiento, A. Cremaschi, A. Guglielmi (2013). Cluster analysis of curved-shaped data with species-sampling mixture models. *Proceedings of SCo2013 - Complex Data Modeling and Computationally Intensive Statistical Methods for Estimation and Prediction*, ISBN 97888-6493-019-0.

Articles in preparation

A. Cadonna, A. Cremaschi, A. Guglielmi, F. Quintana. "Bayesian nonparametric modeling for large spatio-temporal data with time-varying clustering".

I. Antoniano-Villalobos, A. Cremaschi, R. Piccarreta, S. Wade. "Multivariate Density Regression for Censored, Constrained, and Binary Traits".

A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. "A Bayesian approach for the study of synergistic interaction effects in *in-vitro* drug combination experiments".

A. Cremaschi, L. Rønneberg, K Taskén, M. Zucknick. "BayesSyneRgy: Flexible Bayesian modelling of synergistic interaction effects in in-vitro drug combination experiments" (submitted).

A. Cremaschi, J. Landskron, L. Eroukhmanoff, A. Gade, L. Flage-Larsen, L. Bjørge, A. Urbanucci, K. Taskén. "Ovarian cancer ascites promote aberrant signaling activation plasticity and chemo resistance in tumour microenvironment".

D. Raj, A. Cremaschi, S. Skånland, A. Gade, G. E. Tjønnfjord, F. H. Schjesvold, L. A. Munthe, K. Taskén . "In-Vitro Drug Sensitivity Screening in Chronic Lymphocytic Leukemia (CLL) Primary Patient Samples Identifies Drug Candidates for Precision Cancer Therapy".

D. Raj, M. Giliberto, A. Cremaschi, S. Skånland, A. Gade, G. E. Tjønnfjord, F. H. Schjesvold, L. A. Munthe, K. Taskén. "Drug Sensitivity Screening on Multiple Myeloma for Precision Cancer Therapy". *Blood*, 132, 4677.

Invited talks

2019 – Mar, 26 — A. Cremaschi, R. Argiento, M. Vannucci. "Hierarchical Normalized Completely Random Measures for Robust Graphical Modeling". Department of Mathematics, University of Oslo, Oslo (Norway).

2018 – Dec, 14 — A. Cremaschi, S. Skånland, K. Taskén, M. Zucknick. "Gaussian graphical models for the analysis of phospho-flow cytometry data from drug combination experiments". CFE-CMStatistics 2018, Pisa (Italy).

Jul, 19 — A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. "A Bayesian model for the Study of Drug-Drug Interactions". Dept. of Mathematics, Politecnico di Milano, Milan (Italy).

2017 – Dec, 18 — R. Argiento, A. Cremaschi, M. Vannucci. "A Hierarchical Nonparametric Approach for Robust Graphical Modelling". CFE-CMStatistics 2017, London (UK).

Jul, 4 — A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. "A Bayesian approach to modelling drug interactions. An application to ovarian cancer data". Institute for Molecular Medicine Finland (FIMM), Helsinki (Finland).

2016 – Dec, 9 — A. Cremaschi, J. E. Griffin. "Bayesian inference and prediction for high-frequency data using Particle Filtering". CFE-CMStatistics 2016, Seville (Spain).

Jan — A. Cremaschi, J. E. Griffin. "Bayesian analysis of high-frequency financial data". Dept. of Mathematics, Politecnico di Milano, Milan (Italy).

2014 – May — A. Cremaschi, J. E. Griffin. "Bayesian inference for integer-valued Lévy processes with non-Gaussian Ornstein-Uhlenbeck volatility modelling" Dept. of Engineering, Cambridge University, Cambridge (UK).

2012 – Dec

R. Argiento, A. Cremaschi, A. Guglielmi. "A "Density-Based" Algorithm for Cluster Analysis Using Species Sampling Gaussian Mixture Models". CNR - IMATI, Milano, (Italy).

Contributed talks at conferences

2017 – Aug, 29

A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. *A Bayesian model for the study of drug interactions. An application to ovarian cancer data.* ISBS 2017, Vienna (Austria).

Jul, 10

A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. *A Bayesian model for the study of drug interactions. An application to ovarian cancer data.* ISCB 2017, Vigo (Spain).

2016 – Jun, 19

A. Cremaschi, J. E. Griffin. "Bayesian inference for high-frequency data using particle filtering". 3rd Bayesian Young Statisticians Meeting (BAYSM), Florence (Italy).

2014 – Apr, 28

A. Cremaschi, J. E. Griffin. "Bayesian inference for integer-valued Lévy processes with non-Gaussian Ornstein-Uhlenbeck subordinator". Research Student Conference (RSC) meeting, University of Nottingham, Nottingham (UK).

Posters at conferences

2019 – Jun, 24

A. Cremaschi, L. Rønneberg, A. Frigessi, K Taskén, M. Zucknick. *Investigating a Bayesian semi-parametric model for the study of synergistic interaction effects in in vitro drug combination experiments.* BNP 12, Oxford (UK).

2017 – Sep, 6

A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. *A Bayesian model for the study of drug interactions. An application to ovarian cancer data.* EMBL Meeting, Helsinki (Finland).

2016 – Jun, 6

A. Cremaschi, J. E. Griffin. *Bayesian inference for high-frequency data using particle filtering.* ISBA World Meeting, Sardegna (Italy).

2014 – Nov, 6

A. Cremaschi, J. E. Griffin. *Bayesian (non)parametric inference for integer-valued Lévy processes with Gaussian AR(1) stochastic volatility modelling*, ESOBE Meeting, ESSEC, Paris (France)

2012 – Jul, 7

A. Cremaschi, J. E. Griffin. *Bayesian (non)parametric inference for integer-valued Lévy processes with non-Gaussian Ornstein-Uhlenbeck stochastic volatility modelling.* Computational Methods for Jump Processes, CRiSM, Warwick (UK)

Invited/Contributed talks at conferences (by coauthors)

2018 – Dec, 14

A. Cadonna, A. Cremaschi, G. Guglielmi. "Bayesian spatio-temporal clustering for areal data". CFE-CMStatistics 2018, Pisa (Italy).

Dec, 14

I. Antoniano-Villalobos, A. Cremaschi, R. Piccarreta, S. Wade. "Colombian women's life choices: A Bayesian nonparametric multivariate regression approach". CFE-CMStatistics 2018, Pisa (Italy).

Jun, 24

R. Argiento, A. Cremaschi, M. Vannucci. "A hierarchical nonparametric approach for robust graphical modelling in omics data". ISBA *2018 World Meetings*, Edinburgh (UK).

2016 – Jun

I. Antoniano-Villalobos, A. Cremaschi, R. Piccarreta, **S. Wade**. "Colombian women's life choices: A Bayesian nonparametric multivariate regression approach". ISBA *2016 World Meeting*, Cagliari (Italy).

2012 – Jun

R. Argiento, A. Cremaschi, G. Guglielmi. "A "density-based" algorithm for cluster analysis using Dirichlet process Gaussian mixture models". ISBA *2012 World Meeting*, Kyoto (Japan).

Research Seminars

2018 – Oct, 31 — A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. "A Bayesian model for the study of Drug-Drug Interactions". Institute for Cancer Research, Radium Hospital, Oslo (Norway).

Jun, 7 — A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. "A Statistical model for the study of Drug Interactions". Norwegian Center for Molecular Medicine (NCMM), Oslo (Norway).

2017 – Mar, 14 — A. Cremaschi, A. Frigessi, K Taskén, M. Zucknick. " Preliminary study of drug-drug interaction data". Norwegian Center for Molecular Medicine (NCMM), Oslo (Norway).

2016 – Feb, 26 — A. Cremaschi, J. E. Griffin. " Bayesian analysis of high-frequency financial data". University of Kent, Canterbury (UK).

Jan — A. Cremaschi, J. E. Griffin. *Bayesian analysis of high-frequency financial data.* Politecnico di Milano, Milan (Italy).

2015 – Oct, 26 — A. Cremaschi, J. E. Griffin. " Analysis using Particle Filtering techniques (continued)". EPSRC Meeting, London (UK).

May, 19 — A. Cremaschi, J. E. Griffin. " Analysis using Particle Filtering techniques". EPSRC Meeting, London (UK).

Mar, 6 — A. Cremaschi. " Bayesian parametric Survival Analysis: an application to *Game of Thrones* data ". University of Kent, Canterbury (UK).

2014 – Nov, 1 — A. Cremaschi." Interpretation(s) of Probability and Statistical Modelling". University of Kent, Canterbury (UK).

Oct, 7 — A. Cremaschi, J. E. Griffin. " Analysis of High-Frequency data ". University of Kent, Canterbury (UK).

Sept-Nov — A. Cremaschi. Introductory weekly classes on Stochastic Calculus. University of Kent, Canterbury (UK).

Jun, 27 — A. Cremaschi, J. E. Griffin. " Some approaches to Big Data analysis". EPSRC Meeting, London (UK).

Mar, 14 — A. Cremaschi. " Introduction to Bayesian nonparametrics ". University of Kent, Canterbury (UK).

2012 – Nov, 23 — A. Cremaschi. " Clustering via Bayesian nonparametrics". University of Kent, Canterbury (UK).

Visiting

2018 – Jul — Visting Prof. Alessandra Guglielmi at the Dept. of Mathematics, Politecnico di Milano, Milan (Italy).

2017 – May — Visiting Prof. Tero Aittokallio and Dr. Krister Wennerberg at the Institute for Molecular Medicine Finland (FIMM), Helsinki (Finland).

2013 – May — Visiting Dr. Sara Wade and Prof. Zoubin Ghahramani at the Dept. of Engineering, University of Cambridge, Cambridge (UK).

Scientific Activities

2014 — Seminar co-Leader for the Postgraduate and PhD seminars at the School of Mathematics, Statistics and Actuarial Science (SMSAS). University of Kent, Canterbury (UK).

Seminar Leader PhD for the reading group: "Introduction to Stochastic Calculus". School of Mathematics, Statistics and Actuarial Science (SMSAS). University of Kent, Canterbury, Kent (UK).

Teaching

2017 – Aug-Dec

M. Cominelli. "Bayesian mixture models for the analysis of pFLOW data: an application to a Chronic Lymphocytic Leukemia dataset". Masters Degree dissertation. Supervisors: A. Guglielmi and A. Cremaschi. The student visited the Oslo Center for Biostatistics and Epidemiology (OCBE), Oslo (Norway).

2015 – Mar

PhD lecture from "A Bayesian analysis of some nonparametric problems" by Ferguson, T. S. *The annals of statistics* (1973): 209-230. Dept. of Mathematics, University of Oslo, Oslo (Norway).

Lecturer for the course Foundation Statistics. School of Mathematics, Statistics and Actuarial Science (SMSAS), University of Kent, Canterbury (UK). AcYrs: 2014/15.

Tutoring for the course Stage 1 Mathematics. School of Mathematics, Statistics and Actuarial Science (SMSAS), University of Kent, Canterbury (UK). AcYrs: 2012/13, 2013/14, 2014/15.

Skills

Software

Experienced programmer in R, Matlab, with good knowledge of WinBUGS, C/C++.

Languages

English (fluent); Italian (mother tongue); Spanish (discrete); Norwegian (basic).