

Curriculum Vitae



Personal information

Name / Surname	Andrea Cremaschi
Telephone	+65 82498932
Professional Email	andreacremaschi87@gmail.com
Home page	https://andcre87.github.io/andreacremaschi.github.io/
Nationality	Italian
Date of birth	Nov 20th 1987
Gender	Male

Current Position

Apr 2023 – Now	Senior Scientist I
Sep 2020 – Apr 2023	Senior Research Fellow
	Singapore Institute for Clinical Sciences (SICS), A*STAR, Singapore.
Feb 2023 – Now	Assistant Professor (Adjunct)
	Department of Paediatrics, National University of Singapore (NUS), Singapore.

Previous Positions

Aug 2019 – Aug 2020	PostDoc
	Yale-NUS College, Singapore.
Oct 2016 – July 2019	PostDoc
	Department of Cancer Immunology, Institute of Cancer Research, Oslo University Hospital, Oslo (Norway) and
	Oslo Centre for Biostatistics and Epidemiology (OCBE), 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) Thesis title: “ <i>Comparing computational approaches to the analysis of high-frequency trading data using Bayesian methods</i> ” 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: “ <i>Model-based clustering via Bayesian nonparametric mixture models</i> ” 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: “ <i>On the problem of dataset record-linkage: a probabilistic approach</i> ” Supervisors: Prof. A. M. Paganoni and Dr. F. Ieva
Sep 2001 - Sep 2006	Maturità scientifica. Ist. Giuseppe Peano, Cinisello B.mo, Milan (Italy)

Research Interests

My research interests include both methodological and applied aspects of Statistics, particularly within the Bayesian framework (both parametric and nonparametric), using flexible models for inference in scenarios where the data present non-standard features. These include scenarios where the data present deviations from standard assumptions, such as normality, homogeneity, non-linear relationships and group-specific dependencies. These features are often encountered in biomedical studies, a primary focus of my work, due to the complex phenomena typically investigated in this field. Nevertheless, my interests extend across various domains, including econometrics and behavioural science among others.

The work I am conducting at the Singapore Institute of Clinical Sciences (SICS, A*STAR) focuses on the implementation of advanced, often semi-parametric, Bayesian models to real-life data applications. In particular, I am involved in the study of large longitudinal cohorts (e.g., GUSTO, S-PRESTO) involving Singaporean children and their parents, collecting a wealth of information including biological samples, behavioural traits and socio-demographic characteristics. These datasets are highly heterogeneous as they involve mixed-type responses, a wide range of predictors and time dynamics. In this framework, the application of Bayesian nonparametric models allows for a more flexible fitting. The focus of my work is on detection of modifiable factors for early intervention. The fields of research I mostly focus on are translational neuroscience, metabolomics and child development.

Besides biomedical applications, I am also interested in the cost-effectiveness analysis of intervention strategies in the framework of Health Economics, application of machine learning techniques to imaging, as well as population density dynamics. Recently, I have been involved in projects related to these fields of study, currently in their submission phase.

Publications

Cremaschi A, De Iorio M, Kothandaraman N, Yap F, Tint MT and Eriksson J (2023) Joint modelling of association networks and longitudinal biomarkers: an application to child obesity. *Statistics in Medicine* - in press.

Kee MZL, **Cremaschi A**, De Iorio M, Chen H, Montreuil T, Nguyen TV, Côté SM, O'Donnell KJ, Giesbrecht GF, Letourneau N, Chan SY and Meaney MJ (2023) Perinatal Trajectories of Maternal Depressive Symptoms in Prospective, Community-Based Cohorts across Three Continents. *JAMA Network Open*, 6(10), e2339942-e2339942.

Cremaschi A, Argiento R, De Iorio M, Shirong C, Chong YS, Meaney MJ, Kee MZ (2022) Seemingly Unrelated Multi-State processes: a Bayesian semiparametric approach. *Bayesian Analysis*, 1(1), pp.1-23.

Mozdzen A, **Cremaschi A**, Cadonna A, Guglielmi A, Kastner G (2022) Bayesian modeling and clustering for spatio-temporal areal data: an application to Italian unemployment. *Spatial Statistics*, 52, p.100715.

Franzolini B, **Cremaschi A**, Boom WvD and De Iorio M (2022) Bayesian clustering of multiple zero-inflated outcomes. "Bayesian Inference: Challenges, Perspective, and Prospects" issue of *Philosophical Transactions of the Royal Society A*, guest edited by Professor Michael Jordan, Professor Christian Robert and Professor Judith Rousseau.

Molinari M, **Cremaschi A**, De Iorio M, Chaturvedi N, Hughes AD, Tillin T (2022a) Bayesian Dynamic Network Modelling: an application to metabolic associations in cardiovascular diseases. *Journal of Applied Statistics*, pp.1-25.

– (2022b) Bayesian nonparametric modelling of multiple graphs with an application to ethnic metabolic differences. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 71(5), 1181-1204.

Giliberto M, Thimiri Govinda Raj DB, **Cremaschi A**, Skånland SS, Gade A, Tjønnfjord GE, Schjesvold F, Munthe LA and Taskén K (2022) Ex vivo drug sensitivity screening in multiple myeloma identifies drug combinations that act synergistically. *Molecular Oncology*, 16(6), pp.1241-1258.

Cremaschi A, De Iorio M, Chong YS, Meaney MJ, Kee MZ (2021) A Bayesian nonparametric approach to dynamic item-response modelling: an application to the GUSTO cohort study. *Statistics in Medicine*, 40(27), pp.6021-6037.

Rønneberg L, **Cremaschi A**, Hanes R, Enserink J, Zucknick M (2021) bayesynergy: flexible Bayesian modelling of synergistic interaction effects in in-vitro drug combination experiments. *Briefings in Bioinformatics*, 22(6), p.bbab251.

Wade S, Piccarreta R, **Cremaschi A**, Antoniano-Villalobos I (2021) Colombian Women's Life Patterns: A Multivariate Density Regression Approach. *Bayesian Analysis*, 17(2), pp.405-433.

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

Cremaschi A, Argiento R, Shoemaker K, Peterson C, Vannucci M (2019) Hierarchical Normalized Completely Random Measures for Robust Graphical Modeling. *Bayesian Analysis* (honourable mention in Lindley prize 2019), 1-31.

Skånland S, **Cremaschi A**, Bendiksen H, Hermansen JU, Raj D, Munthe LA, Tjønnfjord GGE and Taskén K (2019a) An in vitro assay for biomarker discovery and dose prediction applied to ibrutinib plus venetoclax treatment of CLL. *Leukemia*, 34(2), 478-487.

– (2019b) Ibrutinib plus Venetoclax synergistically reduces signaling and viability in CLL: implications for biomarker discovery: PB1870. *HemaSphere*, 3, 852.

Raj D, **Cremaschi A**, Skånland S, Gade A, Schjesvold F, Tjønnfjord GE, Geir E, Munthe LA and Taskén K (2019) In-vitro drug sensitivity screening in chronic lymphocytic leukemia (CLL) patient samples identifies drug candidates for precision cancer therapy: PF360. *HemaSphere*, 3, 132.

– (2018) In-vitro drug sensitivity screening in chronic lymphocytic leukemia (CLL) primary patient samples identifies drug candidates for precision cancer therapy. *Blood*, 132, 4676.

Myhrvold IK, **Cremaschi A**, Hermansen JU, Tjønnfjord GE, Munthe LA, Taskén K and Skånland S (2018) Single cell profiling of phospho-protein levels in chronic lymphocytic leukemia. *Oncotarget*, 9(10), 9273-9284.

Neufuss J, Humle T, **Cremaschi A**, Kivell TL (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.

Argiento R, **Cremaschi A**, Guglielmi A (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.

Pipeline

requested revisions

Cremaschi A, Wertz T, De Iorio M. “Repulsion, Chaos and Equilibrium in Mixture Models” *arXiv preprint arXiv:2306.10669*.

Cremaschi A, Yang W, De Iorio M, Evans WE, Yang JJ and Rosner GL. “Bayesian modelling of response to therapy and drug-sensitivity in acute lymphoblastic leukemia” *Research Square*. doi: 10.21203/rs.3.rs-2542277/v1

Husain SF, **Cremaschi A**, Suaini NHA, De Iorio M, Loo EXL, Shek LP, Goh AEN, Meaney MJ, Tham EH and Law EC. “Maternal asthma symptoms during pregnancy on child behaviour and executive function: A Bayesian phenomics approach”

submitted

Cremaschi A, Cadonna A, Guglielmi A, Quintana F. “A change-point random partition model for large spatio-temporal datasets” *arXiv preprint arXiv:2312.12396*.

Harris A, **Cremaschi A**, Lim TS, De Iorio M, Kwa CG. “From Past to Future: Digital Methods Towards Artefact Analysis” *arXiv preprint arXiv:2312.13790*.

Bischof K, **Cremaschi A**, Eroukhmanoff L, Landskron J, Flage-Larsen L, Gade A, Bjørge L, Urbanucci A and Taskén K. “Patient-derived ascites affects drug responses in ovarian cancer cell lines through the activation of key signaling pathways”

in preparation

Cremaschi A, Franzolini B, De Iorio M, Fogel AM, Eriksson JG. “A joint approach to the analysis of longitudinal growth measures and eating behaviour questionnaires in the GUSTO cohort”

van den Boom W, **Cremaschi A**, Beng Hui Ng N, Franzolini B, Tan KB, Chan Kok Yen J, Tan KH, Chong YS, Eriksson JG and De Iorio M. “Post-partum diabetes screening of mothers with a history of gestational diabetes: a cost-effectiveness analysis in Singapore”

Cremaschi A, van den Boom W. “Identification of network structures via generalised latent positions models in hyperbolic spaces”

Mozdzen A, De Iorio M, **Cremaschi A**. “Flexible repulsive mixture models for clustering”

Thway Tint M, **Cremaschi A** et al. “Body composition and bone health in women of reproductive age: Differential contributions by lean and fat mass ”

Other Scientific Output

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

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

Cremaschi A (2017) Comparing computational approaches to the analysis of high-frequency trading data using Bayesian methods. *PhD thesis dissertation*. University of Kent, Canterbury. https://kar.kent.ac.uk/60839/1/104Thesis_Cremaschi_Final.pdf

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

Argiento R, **Cremaschi A**, Guglielmi A (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.

Invited talks

2023 – Dec, 16

Cremaschi A, Wertz T, De Iorio M *Repulsion, Chaos and Equilibrium in Mixture Models*. 16th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2023). Berlin, Germany.

2023 – Aug, 01

Cremaschi A, Wertz T, De Iorio M *Repulsion, Chaos and Equilibrium in Mixture Models*. 6th International Conference on Econometrics and Statistics (EcoSta 2023). Tokyo, Japan.

2019 – Mar, 26

Cremaschi A, Argiento R, Vannucci M. “Hierarchical Normalized Completely Random Measures for Robust Graphical Modeling”. Department of Mathematics, University of Oslo, Oslo (Norway).

2019 – Mar, 26

Cremaschi A, Argiento R, Vannucci M. “Hierarchical Normalized Completely Random Measures for Robust Graphical Modeling”. Department of Mathematics, University of Oslo, Oslo (Norway).

2018 – Dec, 14

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

Jul, 19

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

2017 – Dec, 18

Argiento R, Cremaschi A, Vannucci M. “A Hierarchical Nonparametric Approach for Robust Graphical Modelling”. CFE-CMStatistics 2017, London (UK).

Jul, 4

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

2016 – Dec, 9

Cremaschi A, Griffin JE. “Bayesian inference and prediction for high-frequency data using Particle Filtering”. CFE-CMStatistics 2016, Seville (Spain).

Jan

Cremaschi A, Griffin JE. “Bayesian analysis of high-frequency financial data”. Dept. of Mathematics, Politecnico di Milano, Milan (Italy).

2014 – May

Cremaschi A, Griffin JE. “Bayesian inference for integer-valued Lévy processes with non-Gaussian Ornstein-Uhlenbeck volatility modelling” Dept. of Engineering, Cambridge University, Cambridge (UK).

2012 – Dec

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

Contributed talks

2023 – Aug, 01

Cremaschi A, Wertz T, De Iorio M *Repulsion, Chaos and Equilibrium in Mixture Models*. EcoSta 2023, Japan.

2022 – Oct, 24

Cremaschi A, Wertz T, De Iorio M *Repulsion, Chaos and Equilibrium in Mixture Models*. BNP13 2022, Chile.

2021 – June, 28	Cremaschi A, Argiento R, De Iorio M, Shirong C, Chong YS, Meaney MJ, Kee MZ (2021) <i>Seemingly Unrelated Multi-State processes: a Bayesian semiparametric approach</i> . ISBA 2021 (held online).
2017 – Aug, 29	Cremaschi A, Frigessi A, Taskén K, Zucknick M. <i>A Bayesian model for the study of drug interactions. An application to ovarian cancer data</i> . ISBS 2017, Vienna (Austria).
Jul, 10	Cremaschi A, Frigessi A, Taskén K, Zucknick M. <i>A Bayesian model for the study of drug interactions. An application to ovarian cancer data</i> . ISCB 2017, Vigo (Spain).
2016 – Jun, 19	Cremaschi A, Griffin JE. “Bayesian inference for high-frequency data using particle filtering”. 3rd Bayesian Young Statisticians Meeting (BAYSM), Florence (Italy).
2014 – Apr, 28	Cremaschi A, Griffin JE. “Bayesian inference for integer-valued Lévy processes with non-Gaussian Ornstein-Uhlenbeck subordinator”. Research Student Conference (RSC) meeting, University of Nottingham, Nottingham (UK).

Scientific Awards

2021	SICS Emerging Principal Investigator award. Awarded by the Singapore Institute for Clinical Sciences (SICS), A*STAR.
2019	Lindley prize honourable mention for the paper “Hierarchical Normalized Completely Random Measures for Robust Graphical Modeling”, published in <i>Bayesian Analysis</i> , 14(4), 1271-1301, 2019.

Scientific Activities

Organiser

2024	Member of the Organising Committee for <i>Interpretable Inference via Principled BNP Approaches in Biomedical Research and Beyond</i> , 08 Jul 2024 – 02 Aug 2024, IMS/NUS, Singapore.
2024	Member of the Organising Committee for <i>ISBA BNP networking meeting</i> , 30 Jul 2024 – 02 Aug 2024, IMS/NUS, Singapore.
2023 – Nov, 29	Contribution to the organisation of <i>Nutrition and Brain Health</i> , NUS, Singapore.
May, 4	Contribution to the organisation of <i>Military Performance and Resilience in a Warming World</i> , NUS, Singapore. Held on-board the Italian Navy Ship <i>Francesco Morosini</i> .
2022 – Nov, 21	Support in the organisation of <i>Childhood Nutrition: Towards a Healthy Lifestyle</i> , NUS, Singapore.
Since 2022	Organizer of the three-session track “Bayesian semi- and nonparametric modelling” for CM-Statistics, the International Conference of the ERCIM WG on Computational and Methodological Statistics. Joint with: <ul style="list-style-type: none"> – 2022: B. Nipoti (University of Milan Bicocca) and F. Barrientos (University of Florida) – 2023 - Now: F. Barrientos (University of Florida) and Guillaume Kon-Kam-King (INRAE, National Research Institute for Agriculture, Food and Environment, France)

2022-2023	Session Organiser for the International Conference on Econometrics and Statistics (EcoSta), Japan.
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 for the reading group: “Introduction to Stochastic Calculus”. School of Mathematics, Statistics and Actuarial Science (SMSAS). University of Kent, Canterbury, Kent (UK).

Referee

Since 2023	Referee for the peer-reviewed journals <i>Bayesian Analysis</i> , <i>Computational Statistics (COST)</i> .
Since 2022	Referee for the peer-reviewed journals <i>Annals of Applied Statistics</i> , <i>Australian & New Zealand Journal of Statistics</i> , <i>Briefings in Bioinformatics</i> , <i>Statistics in Medicine</i> .

Others

2024	STAR Ambassador at A*GA (A*STAR Graduate Academy), “a vibrant community of student outreach participants committed to inspiring and engaging with future scientists”. Singapore.
-------------	--

Visiting	
2022 – Aug	Visiting Prof. Michael Meaney at The Douglas Research Centre, affiliated with McGill University and the Montreal West Island IUHSSC, Montreal, Canada.
2019 – May	Visiting Dr. Annalisa Cadonna at WU (Vienna University of Economics and Business).
2018 – Jul	Visiting 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).
Teaching and Supervision	
2021/2022	Co-supervision of final “capstone” projects of students from Yale-NUS college, Singapore. Main supervisor: Prof. Maria De Iorio (NUS, A*STAR). <ul style="list-style-type: none"> – Yoon S: “Bayesian Multiple Response Model through RegressiOn Graph Universal Estimator”. – Ropion MDV: “Probability Theory as an Approximation of Reality”.
2021 – Sep, 23	Masterclass on “Statistical Analysis of Questionnaire Data” for the Ministry of Education of Singapore (MOE), MOE Research Forum. Lecture (1h) by Prof. Maria De Iorio; Practical (1h) by Andrea Cremaschi.
2020 – Dec	Lecture talk to the students of the course of Bayesian Statistics “A change-point random partition model for large spatio-temporal datasets”. Cremaschi A, Cadonna A, Guglielmi A, Quintana F. Politecnico di Mialno, Milan (Italy).
2019 – Jul	Lecture talk to the students of the course of Bayesian Statistics “A Bayesian model for the Study of Drug-Drug Interactions”. Cremaschi A, Frigessi A, Taskén K, Zucknick M. Politecnico di Mialno, Milan (Italy).
2018 – Nov	PhD lecture from “A Bayesian analysis of some nonparametric problems” by Ferguson, T. S. <i>The Annals of Statistics</i> (1973): 209-230. Dept. of Mathematics, University of Oslo (Norway).
2017 – Aug-Dec	Masters Degree dissertation. Cominelli M. “Bayesian mixture models for the analysis of pFLOW data: an application to a Chronic Lymphocytic Leukemia dataset”. Supervisors: Guglielmi A and Cremaschi A. The student visited the Oslo Center for Biostatistics and Epidemiology (OCBE), Oslo (Norway).
2014 – 2015	Lecturer for the course Foundation Statistics (approximately 50 students and 48 contact hours). Set and marked the assessments and final examination. School of Mathematics, Statistics and Actuarial Science (SMSAS), University of Kent, Canterbury (UK).
2015 – 2016	Tutor for the course Stage 1 Mathematics. School of Mathematics, Statistics and Actuarial Science (SMSAS), University of Kent, Canterbury (UK).
2013 – 2016	Assessment and marking of undergraduate modules (Stage 1 Mathematics,). School of Mathematics, Statistics and Actuarial Science (SMSAS), University of Kent, Canterbury (UK).
Skills	
Software	Experienced programmer in R, C/C++, Rcpp, Matlab, Python, BUGS.
Languages	English (fluent); Italian (mother tongue); Spanish (intermediate); Norwegian (beginner).

References

Prof. Maria De Iorio
Current Reporting Officer

Professor at Yong Loo Lin School of Medicine, National University of Singapore, Singapore;
Principal Investigator at SICS (A*STAR)
email: mdi@nus.edu.sg

Prof. Jim Griffin
PhD Supervisor

Professor of Statistical Science, Department of Statistical Science, UCL (UK)
email: j.griffin@ucl.ac.uk

Prof. Alessandra Guglielmi
Masters' Supervisor

Full Professor in Statistics, Department of Mathematics, Politecnico di Milano (Italy)
email: alessandra.guglielmi@polimi.it

Prof. Raffaele Argiento
Masters' co-Supervisor

Statistics at the Department of Economics, Università degli Studi di Bergamo (Italy)
email: raffaele.argiento@unibg.it

Prof. Fernando A. Quintana
Collaborator

Profesor Titular, Departamento de Estadística, Facultad de Matemáticas, Pontificia Universidad Católica de Chile (Chile)
email: quintana@mat.uc.cl

Prof. Marina Vannucci
Collaborator

Noah Harding Professor and Graduate Advisor, Department of Statistics, Rice University (Texas)
email: marina@rice.edu