Kwo Lik (Lax) Chan

PERSONAL INFORMATION

Date of birth: 07/07/1991
Address: Dipartimento di STUDI PER L'ECONOMIA E L'IMPRESA, Università del Piemonte Orientale, Novara.

RESEARCH INTERESTS

- Functional data analysis
- Limit theorems of U-statistics
- Multiple systems estimation

PRESENT POSITION

Assistant professor (RTT) in Statistics 05/2025- |
DiSEI, Università del Piemonte Orientale "A. Avogadro", Italy
Honorary assistant professor in Statistics 05/2025-present |
School of Mathematics, University of Birmingham, United Kingdom

PAST POSITIONS

Assistant professor in Statistics 07/2024-05/2025 |
School of Mathematics, University of Birmingham, United Kingdom
Assistant professor (RTD-A) 02/2022-06/2024 |
DiSEI, Università del Piemonte Orientale "A. Avogadro", Italy
Research theme: Small–Ball probability, Functional data analysis
Scientific advisers: Prof. Enea Bongiorno, Professor Aldo Goia
Postdoctoral associate 09/2020-01/2022 |
DiSEI, Università del Piemonte Orientale "A. Avogadro", Italy
Research theme: Small–Ball probability, Functional data analysis
Scientific advisers: Prof. Enea Bongiorno, Professor Aldo Goia

Research Associate 09/2019-03/2020 |
Knowledge Media Institute, The Open University, Milton Keynes, United Kingdom
Research theme: Time-series analysis, Factorial Hidden Markov Models, Combinatorial optimisation, Data analytics
Scientific adviser: Dr. Danica Greetham

Research fellow 08/2018-07/2019 |
Rights lab at the University of Nottingham, United Kingdom
Research theme: Multiple systems estimation, Capture–Recapture, heterogeneity, data analytics
Scientific adviser: Sir Bernard W. Silverman, Fellow of the Royal Society

Research assistant 08/2017-08/2018 |
Horizon Institute at the University of Nottingham, United Kingdom
Research theme: Clustering, classification, stochastic processes, Bayesian inference
Scientific advisers: Dr. Iker Perez, Dr. Mercedes Torres Torres

EDUCATION

Doctor of Philosophy in Mathematics 2014-2018 |
The Open University, Milton Keynes, United Kingdom
Thesis title: Continuous spectra for substitution-based sequences
Supervisors: Prof. Uwe Grimm and Dr. Ian Short

Master of Science in Mathematics 2013-2014 |

The University of Liverpool, United Kingdom

Bachelor of Science in Mathematics with Honours 2010-2013 |
The University of Liverpool, United Kingdom

PUBLICATIONS IN REVIEWED JOURNALS

BOOTSTRAPPING MULTIPLE SYSTEMS ESTIMATES TO ACCOUNT FOR MODEL SELECTION
Bernard W. Silverman, Lax Chan, Kyle Vincent
Statistics and Computing **34 (44)** (2024)

DETECTING THE COMPLEXITY OF A FUNCTIONAL TIME SERIES
Enea G. Bongiorno, Lax Chan, Aldo Goia
Journal of Nonparametric Statistics **36(3)** (2024), 600–622

A LINK FUNCTION SPECIFICATION TEST IN THE SINGLE FUNCTIONAL INDEX MODEL
Lax Chan, Laurent Delsol, Aldo Goia
Advances in Data Analysis and Classification (2023)

MULTIPLE SYSTEMS ESTIMATION FOR SPARSE CAPTURE DATA: INFERENTIAL CHALLENGES WHEN THERE ARE NON-OVERLAPPING LISTS
Lax Chan, Bernard W. Silverman, Kyle Vincent
Journal of American Statistical Association (Theory and methods) **116 (535)** (2021), 1297-1306

DISCUSSION OF MULTIPLE SYSTEMS ANALYSIS FOR THE QUANTIFICATION OF MODERN SLAVERY: CLASSICAL AND BAYESIAN APPROACHES BY SILVERMAN
Ian Dryden, James Goulding, Simon Preston, Lax Chan
Journal of the Royal Statistical Society: Series A **183** (2020)

SUBSTITUTION-BASED STRUCTURES WITH ABSOLUTELY CONTINUOUS SPECTRUM
Lax Chan, Uwe Grimm, Ian Short
Indagationaes Mathematicae **29(4)** (2018), 1072-1086

SPECTRUM OF A RUDIN--SHAPIRO-LIKE SEQUENCE
Lax Chan, Uwe Grimm
Advances in Applied Mathematics **87** (2017), 16-23

PROBLEMS IN STRONG UNIFORM DISTRIBUTION
Kwo Chan[1], Radhakrishnan Nair
Tatra Mt. Math. Publ. **59** (2014), 51-64

A REMARK ON THE DISTRIBUTION OF CHEBYSHEV POLYNOMIALS ON $[-1, 1]$
Kwo Chan, Radhakrishnan Nair
Uniform Distribution Theory **9** (2014), no.2, 125-134

CONFERENCE PROCEEDINGS, ABSTRACT IN BOOKS AND CONFERENCES, AND THESIS

IMPROVING FINITE SAMPLES PERFORMANCES IN NONPARAMETRIC FUNCTIONAL REGRESSION BY USING WEIGHTED PSEUDO-METRICS
Lax Chan, Laurent Delsol, Aldo Goia
In: Aneiros, G., Bongiorno, E.G., Goia, A., Hušková, M. (eds) New Trends in Functional Statistics and Related Fields. IWFOS 2025. Contributions to Statistics. Springer, Cham. (2025)

ANALYSING THE COMPLEXITY MIXTURE STRUCTURE OF DAILY PROBABILITY DENSITIES OF BITCOIN RETURNS
Enea G. Bongiorno, Lax Chan, Aldo Goia
In: Aneiros, G., Bongiorno, E.G., Goia, A., Hušková, M. (eds) New Trends in Functional Statistics and Related Fields. IWFOS 2025. Contributions to Statistics. Springer, Cham. (2025)

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[1] This was my registered name when I was at the University of Liverpool.

TESTING LINEARITY IN THE SINGLE FUNCTIONAL INDEX MODEL FOR DEPENDENT DATA
Lax Chan, Aldo Goia
To appear in Book of "Studies in Classification, Data Analysis and Knowledge Organization" (2024)

A BOOTSTRAP APPROACH TO ACCOUNT FOR MODEL SELECTION IN MULTIPLE SYSTEMS ESTIMATION
Lax Chan, Bernard W. Silverman
Book of Methodological and Applied Statistics and Demography IV, Volume of the Italian Statistical Society Series on Advances in Statistics series

STUDYING A MIXTURE OF FUNCTIONAL DATA HAVING DIFFERENT COMPLEXITY
Enea G. Bongiorno, Lax Chan, Aldo Goia
Book of Methodological and Applied Statistics and Demography III, Volume of the Italian Statistical Society Series on Advances in Statistics series

CONFIDENCE INTERVAL FOR THE COMPLEXITY INDEX OF FUNCTIONAL DATA
Enea G. Bongiorno, Lax Chan, Aldo Goia
Book of Methodological and Applied Statistics and Demography III, Volume of the Italian Statistical Society Series on Advances in Statistics series

NON-PARAMETRIC DIMENSIONALITY DETECTION FOR FUNCTIONAL DATA
Enea G. Bongiorno, Lax Chan, Aldo Goia
In Book of Abstracts of the 25th International Conference on Computational Statistics (COMPSTAT) (2023)

ON SPECIFYING A LINK FUNCTION OF A SINGLE FUNCTIONAL INDEX MODEL
Lax Chan
In Book of Abstracts of the 25th International Conference on Computational Statistics (COMPSTAT) (2023)

GOODNESS-OF-FIT TEST FOR THE SINGLE FUNCTIONAL INDEX MODEL
Lax Chan, Aldo Goia
Book of Short Papers - CLADAG 2023 [in press]

A SPECIFICATION TEST FOR THE SINGLE FUNCTIONAL INDEX MODEL.
Lax Chan
In Book of Abstracts of the 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics)(2022)

EVALUATING THE COMPLEXITY OF A FUNCTIONAL TIME SERIES
Enea G. Bongiorno, Lax Chan, Aldo Goia
In Book of Abstracts of the 14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics)(2021)

ABOUT THE COMPLEXITY OF A FUNCTIONAL TIME SERIES
Enea G. Bongiorno, Lax Chan, Aldo Goia, Philippe Vieu
In Book of Abstracts of the 5th International Workshop On Functional and Operatorial Statistics (2021)

CONTINUOUS SPECTRA FOR SUBSTITUTION-BASED SEQUENCES
Lax Chan
PhD thesis (2018)

SUBSTITUTION-BASED SEQUENCES WITH ABSOLUTELY CONTINUOUS DIFFRACTION
Lax Chan, Uwe Grimm
Journal of Physics: conference series, **809** (2017) 012027

TECHNICAL REPORT

ON BAYESIAN INFERENTIAL TASKS WITH INFINITE-STATE JUMP PROCESSES: EFFICIENT DATA AUGMENTATION
Iker Perez, Lax Chan, Mercedes Torres Torres, James Goulding, Theodore Kypraios
arXiv: 1806.02458

R PACKAGES

SPARSEMSE 2.0.1
Lax Chan (maintainer and creator), Bernard W. Silverman, Kyle Vincent

INVITED TALKS AND SEMINARS

A link function specification test in semi-parametric regression 07/09/2023 |
Data Science and Computational Statistics Seminar, University of Birmingham, UK

On specifying a link function of a single functional index model 22-25/08/2023 |
Invited talk at the 25th International Conference on Computational Statistics, London

Goodness-of-fit test for the Single Functional Index Model 04/07/2023 |
Seminari di Matematica e Statistica, Università del Piemonte Orientale, Italy

A specification test for the single functional index model 17-19/12/2022 |
Invited talk at the 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics), London

On the complexity index of a functional time series 20-24/06/2022 |
Invited talk at the International Symposium of Nonparametric Statistics, Pathos, Cyprus

Evaluating the complexity of a Functional Time Series 18-20/12/2021 |
Invited talk at the 14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics), online

Substitution-based structures with absolutely continuous spectrum 29/03/2017 |
Invited talk at Open Statistical Physics, Milton Keynes, UK

Diffraction spectrum of a Rudin--Shapiro-like sequence 07/06/2016 |
Plenary talk, Transversal aspects of tilings at Oléron, France

CONTRIBUTED TALKS AND POSTER PRESENTATIONS

Improving Finite Samples Performances in Nonparametric Functional Regression by Using Weighted Pseudo-metrics 25-27/06/2025 |
Poster presentation at the International Workshop on Functional and Operatorial Statistics (IWFOS), Novara, Italy

Complexity mixture processes 25-27/06/2025 |
Poster presentation at the International Workshop on Functional and Operatorial Statistics (IWFOS), Novara, Italy

A bootstrap approach to account for model selection in Multiple Systems Estimation 17-20/06/2024 |
Contributed talk at the 52nd Scientific meeting of the Italian Statistical Society (2024), Bari, Italy

Goodness-of-fit test for the Single Functional Index Model 11-13/09/2023 |
Contributed talk at the 14th Scientific meeting Classification and Data Analysis group, Salerno, Italy

About the complexity of a Functional Time Series 23/06/2021 |
Contributed talk at the International Workshop for Functional and Operatorial Statistics, online

Inflation-based sequences with absolutely continuous spectrum 16-24/09/2016 |
Poster presentation at International Conference on Quasicrystals, Kathmandu, Nepal

MEMBER OF INTERNATIONAL WORKING GROUP

COST Action CA21163 “HiTEc”, "Text, functional and other high-dimensional data in econometrics: New models,methods,applications" 2022-2026 |
Grant funded by European Union

Responsive Algorithmic Enterprise: Energy management system for SMEs 09/2019-03/2020 |

Knowledge Media Institute, the Open University, Milton Keynes, United Kingdom
Funded externally by AND technology and research
Principal investigator: Dr. Danica Greetham

Data and Measurement Programme 08/2018-07/2019 |
Rights lab at the University of Nottingham, United Kingdom
Funded by the University of Nottingham Beacon of excellence programme
Principal investigators: Professor Doreen Boyd, Sir Bernard W. Silverman, Fellow of the Royal Society

GRANTS AND AWARDS

FSE REACT-EU, PON Ricerca e Innovazione 2014-2020 2022-2025 |
Grant funded by European Union

Project title: Small-ball probabilities in Functional Statistics: theoretical aspects and applications to economic and financial data 2020-2022 |
Competitive grant funded by Fondazione CRT

- Young scientist award to attend International conference on Quasicrystals 2016
- Partial funding to attend thematic month at Oléron, France 2016
- Fully funded studentship with stipend 2014-2017
- Liverpool affinity award 2013-2014
- Faculty of physical sciences and engineering postgraduate scholarship 2013-2014
- Departmental scholarship for M.Sc. students 2013-2014
- University of Liverpool regional award 2010-2013

SUPERVISION

Mentored German exchange student Marcus Voss on energy disaggregation project 2019 |
Knowledge Media Institute, The Open University

- I co-supervised Marcus with Dr. Danica Greetham on energy disaggregation. During his time here, he implemented deep learning algorithms on energy disaggregation. His results formed part of our report back to the industry partner.

Mentored French exchange student Nicolas Laube on aperiodic tiling 2017 |
School of Mathematics and Statistics, The Open University

- Organized meeting and planned goals to be achieved during his stay. Discussed with him on his weekly reading. Assessed his progress made each week. He produced a report and Python code that generated aperiodic tilings.

TEACHING EXPERIENCE

Course leader and lecturer |
Universita del Piemonte Orientale, Italy

1. 2022-2023, 2023-2024, 2025-2026 Statistics for finance (Master level) (60 hours) 8 ECTS
   - Scientific sector: SECS-S/01
   - Duties: Preparation of lecture slides, homework sheets and solutions, R codes, exams and management of teaching website. Delivery of lectures and R tutorials and exam marking and oral evaluation
   - Number of students: around 30 students
2. 2023-2024, 2024-25, 2025-2026 Laboratorio di Statistica in(Statistics laboratory) (Bachelor level course in Italian) (20 hours) 2 ECTS
   - Scientific sector: SECS-S/01
   - Preparation of homework sheets and solutions and management of teaching website. Delivery of lectures.
   - Number of students: around 300 students

Course leader and lecturer |
University of Birmingham, United Kingdom

1. 2024-2025 Nonparametric Statistics (Master level) (Lecture: 24 hours Guided independent study: 76 hours) 5 ECTS
   - Scientific sector: SECS-S/01
   - Duties: Creation of lecture slides, homework sheets and solutions, R codes, exams and management of teaching website. Delivery of lectures, problem classes, R tutorials and exam marking.
   - Number of students: around 20 students
2. 2024-2025 Statistics (Bachelor level) (Lecture: 24 hours) 5 ECTS
   - Scientific sector: SECS-S/01
   - Creation of lecture slides, homework sheets and solutions, R codes, exams and management of teaching website. Delivery of lectures, problem classes and exam marking.
   - Number of students: around 300 students

Teaching assistant to Prof. Aldo Goia 2021-2022 |
Universita del Piemonte Orientale

- Statistics for finance (Master level) (60 hours).

Teaching assistant to Prof. Uwe Grimm 2014-2015 |
London taught course centre's PhD course

- Aperiodic order: Marking assignments (10 hours) and assisting in tutorials (2.5 hours).

Teaching assistant to the following undergraduate/postgraduate courses 2013-2014 |
The University of Liverpool

- Calculus I (first year): Teaching in tutorials (10 hours) and marking assignments (25 hours)
- Calculus II (first year): Teaching in tutorials (10 hours) and marking assignments(20 hours)
- Introduction to Statistics (first year): Teaching in tutorials (5 hours)
- Complex functions (Second year): Teaching in tutorials (10 hours) and marking assignments (20 hours)
- Geometry of curves (third year): Teaching in tutorials (5 hours) and marking assignments (15 hours)
- Group theory (third year): Teaching in tutorials (5 hours) and marking assignments (10 hours)
- Analysis and number theory (third year): Teaching in tutorials (10 hours)

COURSE MATERIAL DESIGN ASSISTANCE

Professor Uwe Grimm's course: Aperiodic order 2014-2015 |
London taught course centre

- I proof-read his online slides and homework. Further, I proof-read and gave suggestion to a condensed version of his course material which later became a chapter in the book *Dynamical and Complex Systems, LTCC Advanced Mathematics Series volume 5*.

Online course material (textbooks) 2014-2015 |
School of Mathematics and Statistics, The Open University

- I proof-read, went through textbooks material and provided feedback for M337 Complex analysis and MST124 Essential Mathematics I. The latest version of the textbook materials are now in print.

GRANTS REVIEW EXPERIENCE

- UK research and innovation future leaders fellowships (2023)

REFEREE FOR JOURNALS

- Computational Statistics
- Statistics and Computing
- Computational statistics and Data analysis

ORGANISATION OF SESSIONS IN CONFERENCES

International workshop on Functional and Operatorial Statistics, Novara, Italy 25-27/06/2025 |
MEMBER OF ORGANISING COMMMITEE

Advances in functional data analysis, Joint with Prof. Enea Bongiorno 27-30/08/2024 |
ORGANISED SESSION AT THE 26TH INTERNATIONAL CONFERENCES ON COMPUTATIONAL STATISTICS, GIESSEN, GERMANY

Advances in functional data: Theory and applications, Joint with Prof. Enea Bongiorno 22-25/08/2023 |
ORGANISED SESSION AT THE 25TH INTERNATIONAL CONFERENCES ON COMPUTATIONAL STATISTICS, LONDON, UNITED KINGDOM

DEPARTMENTAL ADMINISTRATION

Committee for evaluation of applications of contracted professors or teachers 2022-present |
DISEI, UNIVERSITÀ DEL PIEMONTE ORIENTALE "A. AVOGADRO"

Committee for evaluation of English capability for entry to master level courses 2022-present |
DISEI, UNIVERSITÀ DEL PIEMONTE ORIENTALE "A. AVOGADRO"

Founder and coordinator of postgraduate students seminar 2014-2017 |
SCHOOL OF MATHEMATICS AND STATISTICS, THE OPEN UNIVERSITY

Student chair of modules and teaching review committee 2010-2013 |
THE UNIVERSITY OF LIVERPOOL

- Led a team of seven to process students reviews of all the courses the department offered. Wrote summary reports and delivered them to lecturers. Presented findings to the student-staff committee and lead to better teaching qualities.

MEMBERSHIP IN SOCIETIES

- Member of Gruppo Nazionale per l'Analisi Matematica, la Probabilità e le loro Applicazioni, InDAM
- Member of the Società Italiana di Statistica
- Fellow of the Royal Statistical Society

COMPUTER SKILLS

- R (with experience of writing CRAN approved package)
- Python (Implemented Factorial Hidden Markov Models and Combinatorial optimisation on energy data set)
- Matlab (Implemented state of the art classification algorithms)
- LaTeX(Articles and report writing)

LANGUAGE SKILLS

- Mother tongue: Cantonese
- Other languages: English, Italian.