Clifford Lam

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Present Position

- **London School of Economics, UK.** **2008-**
  Lecturer, Department of Statistics.

Education

- **Princeton University, U.S.A.** **2004 - 2008**
  Ph.D. student in Operations Research & Fin. Eng.

  Ph.D. thesis: High-dimensional profile likelihood inference and covariance matrices estimation.
  Adviser: Prof. Jianqing Fan.

  Courses taken include: Statistical Theory and Methods, Linear and Non-linear Optimization, Stochastic Modeling, Probability Theory, Stochastic Calculus and Finance, Financial Econometrics, Generalized Linear Models, Markov Processes, Asymptotic Theory in Statistics, Nonparametric Modeling and Functional Data Analysis.

- **University of Oxford, U.K.** **2000 - 2001**
  M.Sc. in Applied Statistic Class: Distinction

  M.Sc. dissertation : The British General Election : Analysis Of The Changes Of Electoral Results From 1997 To 2001.
  Adviser: Prof. David Firth.

- **University of Oxford, U.K.** **1997 - 2000**
  B.A. in Mathematical Sciences Class: First Class Honor

Research Grants

- STICERD/Annual Fund New Researcher Award. "Dimension Reduction Using Factor Models : With Applications in Finance". April 2009 - September 2012

Research Interests

My research interests include semiparametric modeling, variables and feature selection, regularisation methods and high dimensional time series analysis. One area I'm working on is the estimation of a large covariance/precision matrix. With random matrix theories more developed over the past decade, it is a high time for further developments of theories and methodologies in this area. Estimation of covariance/precision matrix is particularly important in portfolio allocation and risk assessment in finance, classification and large scale hypothesis testing in bioinformatics, or forecasting in macroeconomics time series, to name but a few areas.

I'm also interested in spatial econometrics modelling. A commonly used model is the spatial lag/error model for a large spatial panel of time series. To be able to use such a model, a component called the spatial weight matrix, which is a square matrix of the same size as the dimension of the panel, has to be pre-specified. This matrix represents the underlying spatial interdependence structure of the data. Yet there are no universal rules in doing so, and most practitioner use certain distance metrics to

specify such a matrix, which is at best a crude approximation to the said structure. Moreover, when the dimension of the panel increases, it becomes more difficult to specify this spatial weight matrix. I have been researching ways to estimate this matrix by regularisation, with some interesting results showing that to estimate such a matrix and other parameters of the model from data is possible.

Another direction is on large factor models handling a medium to large set of stocks or environmental variables. Various aims include estimating the volatility matrix or the inverse of the volatility matrix, with implications on risk management and portfolio allocations in finance, or detecting change of structures for possible effects of climate change in environmental data. Further, to develop regularisation methods for general factor modeling of high dimensional time series data for purposes such as improvement of predictions, identification of factors and detection of the number of them, etc.

Papers/Working Papers

- Lam, C. and Souza, P.C.L. (2013). Regularization with Instrumental Variables for Spatial Panel Time Series. Working Paper.
- Lam, C. and Souza, P.C.L. (2013). Regularization for Spatial Panel Time Series Using the Adaptive LASSO. *Manuscript*.
- Lam, C. and Qu, C. (2013). Discussion of "Large covariance estimation by thresholding principal orthogonal complements" by Fan, Liu and Mincheva. *Journal of Royal Statistical Society B*, to appear.
- Lam, C. (2012). Challenges to Time Series Analysis in the Computer Age. *To be published in the book "Statistics - Discovering your future power"*, China Statistics Press.
- Lam, C. and Yao, Q. (2012).Factor Modeling for High Dimensional Time-Series: Inference for the Number of Factors. *Ann. Statist.*, **40(2)**, 694–726. Supplementary materials can be found here.
- Lam, C., Yao, Q. and Bathia, N. (2011). Estimation of Latent Factors for High-Dimensional Time Series. *Biometrika*, **98(4)**, 901–918.
- Lam, C. (2010). Estimation of Large Precision Matrices Through Block Penalization. *Manuscript*.
- Lam, C. and Fan, J. (2009). Sparsistency and Rates of Convergence in Large Covariance Matrix Estimation. *Ann. statist.*, **37(6B)**, 4254–4278.
- Lam, C. and Fan, J. (2008). Profile-kernel likelihood inference with diverging number of parameters. *Ann. Statist.*, **36(5)**, 2232–2260.

Referee Services

Associate editor of:

- Statistica Sinica (2011-2013)
- Journal of Statistical Planning and Inference (2012-2013)

Also served as a referee for:
Annals of Statistics, Journal of the American Statistical Association, Journal of the Royal Statistical Society: Series B, Econometrica, Journal of Time Series Analysis.

Presentations

- Invited speaker for ICSA Hong Kong, December 2013.
- Invited speaker for the Oberwolfach Workshop "Statistical Inference for Complex Time Series Data", September 22-28, 2013.
- Invited speaker for the 12th International Workshop Spatial Econometrics and Statistics, Université d'Orléans (France), June 17-19, 2013.
- Seminar, Queen Mary University of London, February 28, 2013.
- Invited speaker for the conference "Meeting the Challenges of High Dimension: Statistical Methodology, Theory and Applications", 13 Aug - 26 Oct, 2012, IMS, National University of Singapore.
- Invited speaker for the conference "Financial Time Series Analysis: High-dimensionality, Nonstationarity and the Financial Crisis", June 1-22, 2012, National University of Singapore.
- Seminar, ECARES, Universit Libre de Bruxelles, April 26, 2012.
- Seminar, the University of Bristol, December 2, 2011.
- Invited speaker for JSM 2011, July 30 - August 4, Miami Beach, Florida.
- Invited speaker for IWFOS 2011, June 16-18, 2011, Santander, Spain.
- Seminar, the University of Manchester, March 9, 2011.
- Invited speaker for ICSA 2010, December 19-22, 2010, Guangzhou University, Guangzhou, China.
- Invited speaker for INSPIRE 2010 Conference on information representation and estimation, September 6-8, 2010, UCL, UK.
- Invited speaker for EMS 2010, August 17-22, 2010, The University of Piraeus, Greece.
- Guest Lectures on Factor Modeling, July 27 - August 9, 2010, Center for the Study of Finance and Insurance, Osaka University.
- Invited speaker for the "Young Researchers Workshop on Finance 2010", Tokyo Metropolitan University & CARF, The University of Tokyo.
- Seminar, Department of Mathematics, University of York. February 25, 2010.
- Invited speaker for the conference in celebration of Howell Tong's 65th birthday, Hong Kong University. December 2009.
- TSE-IMT Workshop "Statistics and Econometrics with High Dimensional Data", Toulouse School of Economics, "Estimation of Large Latent Factor Models for Time Series Data", December 1, 2009.
- Seminar, Universiteé catholique de Louvain, "Estimation of Large Latent Factor Models for Time Series Data", October 23, 2009.

- Invited speaker for the 2009 International Conference on Financial Statistics and Financial Econometrics, Southwestern University of Finance and Economics, Chengdu, Sichuan. July 2009.

- Seminar, Oxford-Man Institute of Quantitative Finance. "Large Precision Matrix Estimation for Time Series Data with Latent Factor Model", April 28, 2009.

- Sparsity in Machine Learning and Statistics 2009. "Large Precision Matrix Estimation for Time Series Data with Latent Factor Model", Cumberland Lodge, UK, 1 - 3 April 2009.

- The Fourth London Oxbridge Time Series Conference 2009. "Large Precision Matrix Estimation for Time Series Data with Latent Factor Model", March 20, 2009.

- Seminar, Dept. of Statistics, LSE. "Large Precision Matrix Estimation for Time Series Data with Latent Factor Model", Feb 6, 2009.

- Dept. of Statistics, LSE. "High Dimensional Factor Analysis with Time Series Data", Dec 10, 2008.

- Dept. of Statistics, UCL. "Block Penalisation for Precision Matrix Estimation".

- Dept. of Statistics, the University of Bath. "Block Penalisation for Precision Matrix Estimation", Oct 3 2008.

- 7^{th} World Congress in Probability and Statistics Singapore 2008. "Estimation of large covariance matrices through block penalization".

- Invited seminar, Dept. Of Statistics and Actuarial Science, the University of Hong Kong, "Estimation of large covariance matrices through penalization", Feb 13, 2008.

- Invited seminar, Statistics Dept., the Chinese University of Hong Kong,"Estimation of large covariance matrices through penalization", Feb 12, 2008.

- The Joint Statistical Meetings 2007, Salt Lake City, Utah, USA. Presentation of "Profile-kernel likelihood inference with diverging number of parameters".

- ICSA 2007 Applied Statistics Symposium, Raleigh, North Carolina, USA. Student award presentation of "Profile-kernel likelihood inference with diverging number of parameters".

Teaching Experience

Courses in LSE

- 2011/12 : Lecture, ST203 Statistical Models and Data Analysis.
- 2010/13 : Lecture, ST422 Time Series.
- 2008/13 : Lecture, ST300 Regression and Generalised Linear Models.
- 2008/10 : Class tutor, ST201 Statistical Models and Data Analysis.

London Taught Course Center (LTCC)

- 2011/2012 : Introduction to Semiparametric Modeling.

Teaching Assistant, Princeton University.

- Undergraduate level:
  - ORF 245: Fundamentals of Engineering Statistics (by Prof Jianqing Fan).
  - For four academic terms, including one hour of precept every week. Office hours and grading responsibility.
- Graduate level:
  - ORF 524: Statistical Theory and Methods (by Prof Jianqing Fan).
  - ORF 535: Financial Risk Management (by Prof Patrick Cheridito).
  - ORF 525: Generalized Regression Models (by a postdoctoral student of Prof Jianqing Fan).

  Each course requires office hours and grading responsibility, and I have been a teaching assistant for one academic term for each of these courses.

Languages

- English (fluent in reading, speaking and writing)
- Cantonese (fluent in reading, speaking and writing)
- Mandarin (Intermediate in speaking, fluent in reading and writing)