

Curriculum Vitae

Full name: Frederick Lombard

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Academic qualifications: M.Sc. (Pretoria, 1967). Ph.D. (Rand Afrikaans University, 1975).

Present positions: Emeritus Professor, Department of Statistics, University of Johannesburg.
Extraordinary Professor, Centre for Business Mathematics and Informatics,
North-West University, Potchefstroom.
Visiting Professor, Texas A&M University, College Station, TX, USA.

Employment history

1967: Junior Lecturer, University of Pretoria.

1968: Statistician, Atlas Aircraft Corporation.

1969- 1970: Market Research Officer, United Tobacco Companies.

1971-1979: Lecturer, Senior Lecturer, Department of Statistics, Rand Afrikaans University.

1979-1988: Professor of Statistics, University of South Africa.

1988-2010: Professor of Statistics, Rand Afrikaans University/University of Johannesburg.
(Chairman, Department of Statistics: 1995-2000; Chairman, Department of
Mathematics and Statistics: 2001, 2003 – 2005, Head, Department of Statistics:
2007). Retired, December 2010.

Visiting appointments

Jan.-June 1977: Visiting Lecturer, Potchefstroom University.

Nov. 1982- May 1983: Visiting Scholar, Department of Mathematical Sciences,
University of Delaware.

Aug. 1989-May 1990: Visiting Professor, Department of Statistics, Texas A&M University.

June-Sept. 1995: Visiting Professor, Department of Statistics, Ohio State University.

Feb.-May 2000: Visiting Professor, Rhodes University.

Sept. 2000: Visiting Professor, Stellenbosch University.

June-August, 2000-2013: Visiting Professor, Department of Statistics, Texas A&M University.

Professional Scientific Activities

International Biometric Society: Associate Editor of the journal *BIOMETRICS:*
January 1997 – January 2007.

Chemometrics and Intelligent Laboratory Systems: Associate Editor 2006-2012.

South African Statistical Journal: Editor 1981-82; 1989-90; 2003-2005.
Associate Editor 1978-80; 1986-88; 1991-92.

South African Statistical Association: Member of Executive: 1976-82, 1999. President: 1981.

National Research Foundation:

Member of evaluation committee for Statistics, 1984-88, and of advisory committee for Mathematical Sciences, 1988-89. Assessor for the Physical Sciences, 1992, 1994. Assessor for all Sciences, 1993. Member of panel reviewing the Core Program, 1996. Member of the Appeals Committee, Jan. 2000 – Dec. 2005.

Electricity Supply Commission of South Africa: Research portfolio steering committee for plant information systems, 1996-1999.

International Statistical Institute: Africa representative on the ISI consultative committee on Statistics in Business and Industry, Feb. 2002 - Feb. 2004.

Supervision of postgraduate theses:

Ph.D.: A.P. Burger (1981). C.M. Erasmus (1987). J.L. Fresen (1992). J.L. van Wyk (1994). Y. Shen (2002). M.C. Koen (2002). D. Potgieter (2002). H. F. van Rooy (2006), N. Uys (2008), C.J. Potgieter (2009), U. Human (2009), J.L. Robbertse (2013).

M.Sc. by research.

J.L. van Wyk (1986). T. Winter (1996). P.J. du Toit (1996), D. Potgieter (2000), U. Human (2005), Y. Stander (2005), S. Greenberg (2006), J.L. Robbertse (2007), C.J. Potgieter (2007), G.P. Moolman (2008), J-P Marshall (2008), M. Barosso (2009), Q. de Jager (2013), N. Crotty (2013), H. Sonnekus (2013 ; Co-supervisor), J van Appel (2013; Co-supervisor)

Current Postgraduate students :

Ph.D.: F. van der Walt, J. Visagie, F. Amod, G. Grobler.

M.Sc. by research: Z. Loonat, C van Zyl.

Scientific Awards

1981: Elected Fellow of the South African Statistical Association.

1997: Havenga medal for Mathematical Science awarded by the Suid-Afrikaanse Akademie vir Wetenskap en Kuns.

1998: Sichel Medal of the South African Statistical Association for the best research paper in Statistics published in 1997 by a member of the Association.

1998: Excellence Award from the Executive Director of Eskom for outstanding statistical support to Eskom.

2003: Excellence Award from the Executive Director of Eskom for outstanding statistical support to young statisticians in Eskom.

2006: Sichel Medal of the South African Statistical Association for the best research paper in Statistics published in 2005 by a member of the Association.

2013: Sichel Medal of the South African Statistical Association for the best research paper in Statistics published in 2012 by a member of the Association.

2013: "Thought Leader" award of the South African Statistical Association

Statistical consulting

Pharmaceutical

Luitpold-Werk A.G. (Germany) (1984-1987); Restan Laboratories (1984-1987); Roche Pharma - ceuticals (1988-1989).

Manufacturing and Industrial:

African Explosives and Chemical Industries (1976-1977); South African Railways and Harbours (1978); Ensign-Bickford (USA) (1993-1995); Electricity Supply Commission (1994-1999; 2010-2011); Sasol (1999-2001, 2006 - 2007).

Environmental Control:

National Parks Board (1981); AKVAplan-Niva (Norway) (1992-93).

Mining

Miner's Bureau for Occupational Diseases (1981-1983); Chamber of Mines Research Organisation (1989-1990); Ingwe Coal Corporation (1996-2004); Anglo Coal (2008); Eskom (2010-present)

Legal

Hofmeyr Attorneys (1999), Routledge-Modise Attorneys (2008), MNMR Attorneys (2008); Department of Justice (2010, 2012).

Financial

Rand Merchant Bank (2005); Centre for Business Mathematics and Informatics, Northwest University (2004 – 2007, 2009); CA-Tech (2011); Nedbank (2011).

Research

Papers published in peer-reviewed journals, refereed conference proceedings and book chapters.

Publications since 2005:

- [48] M.C. Koen and F. Lombard, (2005). Principal components in AGN variability data and the estimation of flux contributions. *MON. NOT. ROY. ASTRON. SOC.*, **357**, 793-799.
- [49] F. Lombard, (2005). Confidence bands for a quantile comparison function. *TECHNOMETRICS*, **47**, No. 3, 364-371.
- [50] F. Lombard, (2005). An elementary derivation of the hitting time distribution of Brownian motion with drift. *SOUTH AFRICAN STATIST. J.*, **39**, 163-170.
- [51] F. Lombard and M.C. Koen, (2006). A re-assessment of the nearest neighbour alignment of the X-ray isophotes of galaxy clusters. *MON. NOT. ROY. ASTRON. SOC.*, **370**, 1324-1328.
- [52] N. Uys and F. Lombard (2007). A Note on Two Sided Cusums for a Normal Mean. *TECHNOMETRICS*, **49**, 195-198.
- [53] J.D. Hart, M.C. Koen and F. Lombard (2007). An Analysis of Pulsation Periods of Long-Period Variable Stars. *J. ROY. STATIST. SOC., Series C* , **56**, 587-606.
- [54] M.C. Koen and F. Lombard (2007). What can be Deduced from Open Cluster Metallicity Measurements? *MON. NOT. ROY. ASTRON. SOC.*, **382**, 693-698.
- [55] C.J. Potgieter and F. Lombard (2008). Estimation of linear treatment effects from matched pair data. *SOUTH AFRICAN STATIST. J.*, **42**, 17-45.
- [56] M.C. Koen and F. Lombard (2009). Is there Evolution in the Infrared Tully-Fisher Relation? Comparing Two Linear Regressions. *MON. NOT. ROY. ASTRON. SOC.*, **395**, 1657-1661.
- [57] G. Lyman, M. Nel, F. Lombard , R. Steinhaus and H. Bartlett (2010). Bias testing of cross-belt samplers. *JOURNAL of the SOUTHERN AFRICAN INSTITUTE of MINING and METALLURGY*, **110**, (6), 289-298.
- [58] F. Lombard (2010). A “statistical” derivation of the price of a call option. Proc. 52nd South African Statistical Association Conference. ISBN 978-0-620-48708-5.
<https://sites.google.com/site/sasaconference2010/>
- [59] J.L. Robbertse and F. Lombard (2010). *Maximum likelihood estimation for fractional Gaussian noise*. Proc. 52nd South African Statistical Association Conference. ISBN 978-0-620-48708-5.
<https://sites.google.com/site/sasaconference2010/>

- [60] F. Lombard (2011). *Changepoint analysis*. In: Methods and Applications of Statistics in Engineering, Quality Control and Physical Sciences, 71-78. New York: John Wiley and Sons. ISBN: 978-0-470-40508-6.
- [61] F. Lombard and C.J. Potgieter (2012). Another look at Grubbs' estimators. *CHEMOMETRICS and INTELLIGENT LABORATORY SYSTEMS*, **110**, 74–80.
- [62] F. Lombard and C.J. Potgieter (2012). A Multivariate Rank Test for Comparing Mass Size Distributions. *JOURNAL of APPLIED STATISTICS*, 39 (4), 851-865.
- [63] F. Lombard and G.J. Lyman (2012). Assessment of the precision and bias of an on-line gauge using a single reference instrument. *JOURNAL of the SOUTHERN AFRICAN INSTITUTE of MINING and METALLURGY*, **112** (1), 7- 13.
- [64] F. Lombard and C.J. Potgieter (2012). Some remarks on the Grubbs estimator. *SOUTH AFRICAN STATISTICAL JOURNAL*, **46** (1), 65-84.
- [65] C.J. Potgieter and F. Lombard (2012). Nonparametric estimation of location and scale parameters. *COMPUTATIONAL STATISTICS and DATA ANALYSIS*, **56**, 4327-4337.
- [66] F. Lombard and J.L. Robbertse (2012). Testing Constancy of the Hurst Exponent of some Stationary Long Memory Gaussian Time Series. *SOUTH AFRICAN STATISTICAL JOURNAL*, **46** (2), 247-266.
- [67] F. Lombard and R. Maxwell# (2012). A Cusum Procedure to Detect Deviations from Uniformity in Angular Data. *JOURNAL of APPLIED STATISTICS*, **39**, 1871-1880.
- [68] F. Lombard and G.J. Lyman (2012). Comparing two mass size distributions. *JOURNAL of the SOUTHERN AFRICAN INSTITUTE of MINING and METALLURGY*, **112**, 613-619
- [69] P. Hall, F. Lombard and C.J. Potgieter (2013). A new approach to function-based hypothesis testing in location-scale families. *TECHNOMETRICS*, **55**, 215-223.
- [70] J.L. Robbertse and F. Lombard and (2013). On Maximum Likelihood Estimation of the Long Memory Parameter in Fractional Gaussian Noise. To appear in *JOURNAL of STATISTICAL COMPUTATION and SIMULATION*.

Publications prior to 2005:

- [1] F. Lombard, (1975). Aspects of Stochastic Processes and their Applications. *TEGNIKON*, **23** (2), 3-5.
- [2] F. Lombard, (1976). Truncated Sequential Tests based on One-Sample Rank Order Statistics. *SOUTH AFRICAN STATIST. J.*, **10**, 177-185.

- [3] F. Lombard, (1977). Sequential Procedures based on Kendall's Tau. *SOUTH AFRICAN STATIST. J.*, **11**, 79-87.
- [4] J.C. Geertsema, F. Lombard and J.W.H. Swanepoel, (1978). On Farrel's Sequential Confidence Interval Procedures. *SOUTH AFRICAN STATIST. J.*, **12**, 117-143.
- [5] F. Lombard and J.W.H. Swanepoel, (1978). On Finite and Infinite Confidence Sequences. *SOUTH AFRICAN STATIST. J.*, **12**, 1-24.
- [6] J.W.H. Swanepoel and F. Lombard, (1978). Fixed Width Sequential Confidence Interval for the median of a Distribution. *COMMUN. STATIST.*, **A7(9)**, 829-835.
- [7] F. Lombard, (1978). A Sequential Test for the Mean of an Inverse Gaussian Distribution. *SOUTH AFRICAN STATIST. J.*, **12**, 107-116.
- [8] F. Lombard and J.W.H. Swanepoel, (1979). An Asymptotic Sequential Test based on Confidence Sequences. *COMMUN. STATIST.*, **A8(2)**, 107-116.
- [9] A.van As and F. Lombard, (1981). Body Surface Area of the Chacma Baboon. *GROWTH*, **45**, 322-328.
- [10] F. Lombard, (1981). An Invariance Principle for Sequential Nonparametric Test Statistics. *SOUTH AFRICAN STATIST. J.*, **15**, 129-152.
- [11] F. Lombard, (1983). Asymptotic Distribution of Rank Statistics in the Change-Point Problem. *SOUTH AFRICAN STATIST. J.*, **17**, pp. 83-105.
- [12] R.J. Carroll and F. Lombard, (1985). A note on N-estimators for the binomial distribution. *J. AMER. STATIST. ASSOC.*, **80**, 423-426.
- [13] F. Lombard and D.M. Mason, (1985). Limit theorems for generalized sequential rank statistics. *ZEITSCHR. f. WAHRSC. TH. VERW. GEB.*, **70**, 395-410.
- [14] F. Lombard, (1986). An elementary proof of asymptotic normality for linear rank statistics. *SOUTH AFRICAN STATIST. J.*, **20**, 29-35.
- [15] F. Lombard, (1986). The change-point problem for angular data: A non-parametric approach. *TECHNOMETRICS*, **28**, 391-397.
- [16] F. Lombard, (1987). Rank tests for change-point problems. *BIOMETRIKA*, **74**, 615-624.
- [17] F. Lombard, (1988). Detecting change-points by Fourier analysis. *TECHNOMETRICS*, **30**, 305-310.
- [18] C.M. Erasmus* and F. Lombard, (1989). The asymptotic distribution of quadratic forms occurring in change-point problems. *CANADIAN JOURNAL of STATISTICS*, **16**, 259-268.

- [19] F. Lombard, (1989). Recent developments in the analysis of change-point data. *SOUTH AFRICAN STATIST. J.*, **23**, 1-21. (Invited paper)
- [20] F. Lombard, (1989). The statistical analysis of change-point data, with applications. 'Recent Developments in Statistics and their Applications', 153-172. Eds. J.P. Klein and J.C. Lee. Freedom Academy Publishing Company, Seoul.
- [21] F. Lombard, O.C. de Jager, and D.M. Schultz, (1990). The detection of a change-point in periodic gamma ray data. *NUCLEAR PHYSICS B*, **14A**, 285-290.
- [22] F. Lombard, (1991). A changepoint analysis of some data arising in gamma-ray astronomy. *SOUTH AFRICAN STATIST. J.*, **25**, 83-98.
- [23] J.L. Fresen* and F. Lombard, (1992). An almost sure expansion for regression M – estimators. *SOUTH AFRICAN STATIST. J.*, **26**, 83-93.
- [24] C.J. Koen and F. Lombard, (1993). The analysis of indexed astronomical time series.I. Basic Methods. *MON. NOT. ROYAL ASTRON. SOC.*, **263**, pp.287-308.
- [25] F. Lombard and C.J. Koen, (1993).The analysis of indexed astronomical time series.II. The O- C (Observed-Calculated) method revisited. *MON. NOT. ROYAL ASTRON. SOC.*, **263**, 309-313.
- [26] F. Lombard, (1993). Application of frequency domain methods to changepoint problems. 'Proceedings of the theme term: Changepoint Analysis - Empirical Reliability', 123-126. Ed. M Csörgö. Carleton University, Canada.
- [27] F. Lombard, (1994). On a Fourier method of detecting climatic changes. *BEITR. ATMOSPHER. PHYS.*, **67**, 201-208.
- [28] F. Lombard and J.D. Hart, (1994). The change-point problem for dependent data. Institute of Mathematical Statistics: LECTURE NOTES-MONOGRAPH SERIES: 'Change-Point Problems', **Vol.23**, 194-209. Eds. E. Carlstein, H.G. Müller, D. Siegmund. ISBN 0 940600 34 X
- [29] J.L. van Wyk and F. Lombard, (1994). Diagnostics and tests for abrupt change with an application to a two-state Markov chain. *Proceedings, 28th Annual Actuarial Research Conference*, 135-140. Ed. E.W. Frees. The Society of Actuaries, Illinois.
- [30] C.J. Koen and F. Lombard, (1995) The analysis of indexed astronomical time series.III. Intrinsic period scatter. *MON. NOT. ROYAL ASTRON. SOC.*, **274**, 821-831.
- [31] G.J. Lyman, F. Lombard, D. Edward and C.J. Clarkson, (1995). Determination of the precision of on-line coal analysers - Theory and practice. 'Proc. VII Australian Coal Preparation Conference', 324-355. The Australian Coal Preparation Society. ISBN 0 9589344 7 9

- [32] R.J. Carroll, H. Kutchenhoff, F. Lombard and L. Stefanski, (1996). Asymptotics for the SIMEX estimator in nonlinear measurement error models. *J. AMER. STATIST. ASSOC.*, **91**, 242-250.
- [33] F. Lombard and C.J. Koen, (1997). Change analysis of astronomical data. In *'Applications of Time Series Analysis in Astronomy and Meteorology'*, pp. 291-303. Eds. T Subba Rao, M.B. Priestley and O. Lessi. Chapman and Hall. ISBN 0 412 63800 2.
- [34] F. Lombard, (1997). Statistical assessment of on-line analyzers. *CHEMOMETRICS and INTELLIGENT LABORATORY SYSTEMS*, **37**, 281-289. (Discussion paper)
- [35] F. Lombard, (1997). Response to comments on the discussion paper "Statistical assessment of on-line analyzers". *CHEMOMETRICS and INTELLIGENT LABORATORY SYSTEMS*, **37**, 299-300.
- [36] F. Lombard and T.D. Winter, (1997). Statistical evaluation of sequential detonation systems. *SOUTH AFRICAN STATIST. J.*, **31**, 12-38.
- [37] F. Lombard, (1998). An Alternative to O-C Analysis of Variable Star Periods. *MON. NOT. ROY. ASTRON. SOC.*, **294**, 657-666.
- [38] F. Lombard, (1998). Changepoint Analysis. *Encyclopedia of Statistical Sciences*. Update Volume 2. pp. 113-120. John Wiley & Sons. ISBN 0-471-11939-3.
- [39] F. Lombard, (1998). Tests for Constancy of a Mean. *Asymptotic Methods in Probability and Statistics*, pp. 585-594. Elsevier Publishing Company. ISBN 0-444-50083-9.
- [40] F. Lombard, (1999). A Rank Test for Constancy of a Location or Scale Parameter. *COMMUN. STATIST. THEORY METH.*, **28** (3&4), 537-549. (Invited paper)
- [41] T. Boshoff, F. Lombard, R. Eiselen, J. Bornman, M. Bachelet, B.S. Polla and L. Bornman (2000). Differential Basal Synthesis of Hsp70/Hsc70 contributes to interindividual variation in Hsp70/Hsc70 inducibility. *CELLULAR and MOLECULAR LIFE SCIENCES*, **57**, pp. 1317-1325
- [42] M.C. Koen and F. Lombard, (2001). The analysis of indexed astronomical time series.VII: Simultaneous use of Maxima and Minima. *MON. NOT. ROY. ASTRON. SOC.*, **325**, 1124-1132.
- [43] F. Lombard, M.C. Koen* and G.D.J. Potgieter, (2001). Testing the bivariate series of rise and fall times of Mira variables for change. *MON. NOT. ROY. ASTRON. SOC.*, **325**, 1133-1141.
- [44] M.C. Koen and F. Lombard, (2002). *Testing Photometry of Stars for Planetary Transits*. Proceedings of the First Eddington Workshop on Stellar Structure and Habitable Planet Finding. Scientific editors: F. Favata, I. W. Roxburgh & D. Galadi. ESA Publications Division, ISBN 92-9092-781-X, 2002, 159–161.

- [45] M.C. Koen and F. Lombard,(2003). Some statistical aspects of estimating the local red clump absolute magnitude, *MON. NOT. ROY. ASTRON. SOC.*, **343**, 241 – 248.
- [46] F. Lombard, (2003). A new approach to determining the Precision and Bias of On-line Gauges, *CHEMOMETRICS and INTELLIGENT LABORATORY SYSTEMS*, **69**, 77-87.
- [47] M.C. Koen and F. Lombard, (2004). The analysis of indexed astronomical time series– IX. A period change test, *MON. NOT. ROY. ASTRON. SOC.*, **353**, 98-104.