

Robert Davies

Statistics Research Associates Limited

I am a consulting and research statistician and a director of Statistics Research Associates, a research and consulting group based in Wellington. My interests and expertise include computational methods in statistics, time-series analysis and inference in both standard and non-standard situations. Recent work includes numerous projects with Opus International Consultants on road safety and road maintenance.

Contact details

Name	Robert Braithwaite DAVIES
Born	Wellington, New Zealand, 1942
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Skills

- Statistical data analysis and the use of the S-plus statistical computing package for both standard and non-standard problems.
- Use of C++ computing language particularly for large scale statistical and numerical problems.
- Research into new statistical methods, especially for unusual situations and for time-series analysis.

Qualifications and awards

2009	Honorary Life Membership, NZ Statistical Association
1980	Fulbright Travel Award
1969	Ph D (University of California, Berkeley, in statistics)
1968	Evelyn Fix Award (UC Berkeley Statistics Department)
1964	M Sc (University of Auckland, 1st class hon. in mathematics)

Employment

1999 to date	Director: Statistics Research Associates Limited
1992 to date	Self-employed consulting statistician
1964 to 1992	DSIR (Manager, Applied Mathematics Group 1990-1992, Director, Applied Mathematics Division 1982-90)

Professional societies

NZ Statistical Association (committee member 1981-3, president 1979-80, editor 1972-7), NZ Mathematical Society (committee member 1975-78), International Statistical Institute, Institute of Mathematical Statistics, Royal Society of NZ, Operational Research Society of NZ, NZ Computer Society, Sigma Xi.

Some recent & current consulting projects

1995-2013	Opus International Consultants: analysis of traffic crash data, analysis of road surface data.
1995-2013	Lotteries Commission: random number generators, probability calculations.
1998-9, 2006-7	Intel Corporation: random number testing.
2005-6	Pharmac: expert witness.
1999-2001	IRD: logistic regression modelling

Publications

Nineteen refereed or invited publications, mostly in leading statistical journals.

Publications of Robert Davies

Refereed publications

- (2012) Evaluation of Measurement Comparisons Using Generalised Least Squares: the Role of Participants' Estimates of Systematic Error, *Communications in Statistics*, accepted for publication. (with J.F. Clare & A. Koo)
- (2011) Confidence intervals in a regression with both linear and non-linear terms, *Electron. J. of Statist.* **5**, 603-618. (with C.S. Withers, S. Nadarajah)
- (2008) Modelling and Analysis of Crash Densities for Karangahake Gorge, New Zealand, *The Australian College of Road Safety Journal* **19**, No 1. (with P.D. Cenek)
- (2002) Hypothesis testing when a nuisance parameter is present only under the alternative - linear model case. *Biometrika* **89** 484-489.
- (1987) Hypothesis testing when a nuisance parameter is present only under the alternative. *Biometrika* **74** 33-43.
- (1987) Tests for Hurst effect. *Biometrika* **74** 95-101 (with D.S. Harte).
- (1980) The distribution of a linear combination of chi-squared random variables. *Applied Statistics* **29** 323-333.
- (1977) Testing the hypothesis that a point process is Poisson. *Adv. Appl. Prob.* **9** 724-746.
- (1977) Hypothesis testing when a nuisance parameter is present only under the alternative. *Biometrika* **64** 247-254.
- (1975) The effect of error in the independent variables in linear regression. *Biometrika* **62** 383-391 (with B. Hutton).

- (1973) Numerical inversion of a characteristic function. *Biometrika* **60** 415-417.
- (1973) Asymptotic inference in stationary Gaussian time-series. *Adv. Appl. Prob.* **5** 469-497.
- (1971) Rank tests for "Lehmann's Alternative". *JASA* **66** 879-883.
- (1969) Beta-optimal tests and an application to the summary evaluation of independent experiments. *J. Roy. Statist. Soc. B*, **31** 524-538.
- (1968) Cannibalism of the pupal stage by adult flour beetles: an experiment and a stochastic model. *Biometrics* **24** 247-275 (with D.B. Mertz).
- (1966) A statistical survey of earthquakes in the main seismic region of New Zealand: Part 2 - Time series analyses. *N.Z. J. Geol. Geophys* **9** 251-284 (with D Vere-Jones).

Invited papers

(Published invited papers that have been informally refereed by the publication editor)

- (2001) Integrated processes and the discrete cosine transform. *Probability, statistics and seismology, A Festschrift for David Vere-Jones*. Ed D.J.Daley. *J. Appl. Probab.* Special Volume **38A**. 105-121.
- (1985) Asymptotic inference when the amount of information is random. *Proceedings of the Berkeley Conference in Honor of Jerzy Neyman and Jack Kiefer*, Volume **2**. Eds L.M. LeCam & R.A. Olsen. 841-864. Wadsworth, Belmont.
- (1983) Optimal inference in the frequency domain. *Handbook of Statistics*, Vol **3**. Eds D.R. Brillinger & P.R. Krishnaiah. 73-92. Elsevier, Amsterdam.
- (1979) Inference from non-ergodic time series (abstract only). *Adv. Appl. Prob.* **11** 261.

Conference papers

- (2008) Factors influencing the in-service skid resistance performance of aggregates. *NZ Transport Agency and NZIHT 9th Annual Conference*, Napier, NZ. (with P.D. Cenek & R.J. Henderson)
- (2005) The effect of skid resistance and texture on crash risk. *International Conference - Surface Friction Roads and Runways*, Christchurch, NZ. (with P.D Cenek & R.J. Henderson)
- (2004) Crash risk relationships for improved safety management of roads. *Towards Sustainable Land Transport conference*, Wellington November 2004. (with Peter Cenek)
- (1994) Writing a matrix package in C++. *OON-SKI'94: The second annual object-oriented numerics conference*, pp 207-213. Rogue Wave Software, Corvallis.
- (1986) Statistics in Science and Industry. *Pacific Statistical Conference*. Eds I.S. Francis, B.F.J. Manly, F.C. Lam. 355-7. Elsevier, Amsterdam.
- (1977) Testing for independence between Poisson processes. *Bull. International Statistical Institute*, **47**, Book 4 140-143.
- (1967) Some techniques of summary evaluation of several independent experiments. *Proc. Fifth Berkeley Symp. Math Statist. and Prob.* **V** 385-388 (with Prem S Puri).

Other published papers

- (2002) Poisson Cluster Process. *Encyclopedia of Environmetrics*, Volume **3**, pp1582-3. Eds A.H. El-Shaarawi & W.W. Piegorisch, Wiley, West Sussex.

- (2002) Intensity, Poisson. *Encyclopedia of Environmetrics*, Volume 3, pp1584-6. Eds A.H. El-Shaarawi & W.W. Piegorisch, Wiley, West Sussex.
- (1995) 1994 NZAS Survey of Scientists' Perceptions of New Zealand Science: Results. *New Zealand Science Review* 52, 7-22. (with M.V. Berridge, C.H. Sissons & H. Offenberger).

Reports

- (2013) *Use of roadside barriers versus clear zones*. New Zealand Transport Agency Research Report 517. (with N.J. Jamieson, G. Waibl)
- (2012) *Crash risk relationships for improved road safety management*. New Zealand Transport Agency Research Report 488. (with P.D. Cenek, R.J. Henderson)
- (2012) *Modelling crash risk on the New Zealand state highway network*. New Zealand Transport Agency Research Report 477. (with P.D. Cenek, R.J. Henderson)
- (2012) *Selection of aggregates for skid resistance*. New Zealand Transport Agency Research Report 470. (with P.D. Cenek, R.J. Henderson)
- (2011) *Improved rate-of-rotation design limits*. New Zealand Transport Agency Research Report 456. (with P.D. Cenek, N.J. Jamieson, R.J. Henderson)
- (2001) *Improved road segmentation for pavement management systems in New Zealand*. Transfund New Zealand Research Report No. 218. (with Marian Loader).
- (1999) *Seasonal and weather normalisation of skid resistance measurements*. Transfund New Zealand Research Report 139. (with P.D. Cenek, D.J. Alabaster)
- (1997) *Road environment and traffic crashes*. Transfund New Zealand Research Report 79. (with P.D. Cenek, M.W. McLarin, G. Griffith-Jones, N.J. Locke)
- (1986) Lead in the Environment in New Zealand. *The Royal Society of New Zealand Miscellaneous Series* 14 (with R.J. Ferrier, I.R. Edwards, D.M. Fergusson, R.D. Reeves, P.J. Scott, C.D. Stevenson).
- (1980) *The chi-squared process with applications to hypothesis testing and time-series analysis*. Technical report, Statistical Laboratory, University of California, Berkeley.

Software

- (1990-2008) Newmat C++ matrix library. <http://www.robertainz.net/ol_doc.htm>
- (1989-2008) Newran random number generator library. <http://www.robertainz.net/ol_doc.htm>