

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
Address	16 Gloucester Street, Wilton, Wellington, 6012, New Zealand
Phone	64-4-475 3346
Internet	robert@statsresearch.co.nz
WWW	http://www.robertnz.net

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

- 1995-2017 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.

Publications

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

Publications of Robert Davies

Refereed publications

- (2014) Evaluation of Measurement Comparisons Using Generalised Least Squares: the Role of Participants' Estimates of Systematic Error, *Communications in Statistics – Theory and Methods* **43:20** 4297-4307. (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

- (2011) A prioritisation scheme for the safety management of curves. *3rd International Road Surface Friction Conference, Gold Coast, Queensland, 15-18 May 2011*. (with P.D. Cenek, CA Brodie, FN Tate)
- (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 P.D. Cenek)
- (1998) Effect of reflectorized number plates on hit parked vehicles in nighttime. *Road Safety Research, policing, education conference, Wellington, NZ, Vol 2* (with V.K. Dravitzki, F.N. Tate, G.F. Koorey)
- (1996) Evaluation of the effect of compulsory breath testing and speed cameras in New Zealand. *Combined 18th ARRB Transport Research Conference and Transit, New Zealand Land Transport Symposium, 2-6 September 1996, Christchurch, New Zealand Part 5* (with M.K. Mara, W.J. Frith).
- (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

- (2017) *Analysis and interpretation of New Zealand long-term pavement performance data*. New Zealand Transport Agency Research Report **633**. (with K.L. Neaylon, L. Harrow, R.V.Henderson)
- (2014) *The relationship between crash rates and rutting*. New Zealand Transport Agency Research Report **545**. (with P.D. Cenek, R.J. Henderson, M Forbes, A Tait)
- (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)
- (2002) *Statistical Analyses of State Highway Crash and Skid Resistance Data: 1995-2000*. Central Laboratories Report No 02-529295.00 (with P.D. Cenek, M.D.J. Loader)
- (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>

