

CURRICULUM VITAE

John J. Deely

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Academic Degrees

Ph.D. Purdue University 1965, Statistics (“Multiple decision procedures from an empirical Bayes approach”. Advisor, Shanti S. Gupta).

M.Sc. Purdue University 1958, Mathematics.

B.E.E. Georgia Tech. 1955.

Membership in Professional Societies

Royal Statistical Society, Institute of Mathematical Statistics, American Statistical Association, International Society for Bayesian Analysis

Professional History

2000–present	Continuing Lecturer, Department of Statistics, Purdue University
1997–1999	Visiting Professor, Department of Statistics, Purdue University
1972–1996	Professor of Statistics, University of Canterbury
1970–1972	Reader; Department of Mathematics; University of Canterbury
1968–1970	Senior Lecturer; Department of Mathematics; University of Canterbury
1965–1968	Research Scientist in the Statistics Section of the Mathematical Research Department at Sandia Corporation, Albuquerque, New Mexico
1966–1968	Part-time Lecturer; Department of Mathematics and Statistics; University of New Mexico, Albuquerque, New Mexico
1960–1965	Instructor (full time); Department of Statistics; Purdue University; West Lafayette, Indiana

1963–1964	Statistical consultant (Summer and part time); Naval Avionics Facility; Indianapolis (NAFI)
1961	Statistical consultant; Holloman Air Force Base at Alamogordo, New Mexico (summer)
1958–1960	Instructor; Department of Mathematics; Purdue University, Fort Wayne Extension; Ft. Wayne, Indiana
1956–1958	Teaching Assistant; Department of Mathematics; Purdue University
1955–1956	Electrical Engineer, NASA (formerly NACA)

Major Professional Interests

I consider myself to have a strong research orientation tempered by a desire to make statistics theory accessible to the practitioners. My training and early professional life have given me a strong background and inherent desire to maintain a productive and personally satisfying research program. At the same time I have developed an active interest in helping the community and commercial enterprises use statistics in a practical way. Probably because of my research orientation, it has invariably been the case that these practical problems have been the starting point for a research paper and thus have reinforced my combined interests.

My academic interests have been balanced between teaching and research. As Professor of Statistics at Canterbury University I was in charge of all statistical teaching and research within the Department of Mathematics. During my 28 years in that position, the program expanded from one course with one hundred students and one statistician (me) to five staff with over eight hundred students in eight statistics courses. Eight Ph.D.'s and sixteen M.Sc.'s (all requiring a thesis) were produced under my direction. During my last two years I initiated the use of EXCEL (Microsoft) as the statistical package for the statistics course offered to a large group of users interested in an introduction to statistical methods. Coming to Purdue, I found that I was encouraged to pursue that development in a similar course. Other faculty members are also now pursuing that development as well as a number of Teaching Assistants whom I have personally supervised and assisted in their use of EXCEL in the teaching laboratories. A further enhancement to this development here at Purdue has been the fact that computing facilities required to demonstrate concepts and details required in the data analysis are available in the lecture room. In addition, I have also developed and update continuously WEB pages for courses I have taught here at Purdue. Over the last nine years I have developed a modern presentation of Statistical concepts in a course containing over 600 first year Liberal Arts students. This includes Power Point lectures, Word documents, video displays, data files and graphics using Microsoft Excel and Web sites containing a variety of statistical information.

The major thrust of my research has been in the area of empirical Bayes and Bayesian methods, although in recent years my interest has been mainly in the fully Bayesian approach. The interaction with practical problems has led me to consider the importance of prior information and quantifying this information in a probabilistic way. I like the

interaction with quantitative people in other disciplines and my associations have been in a wide variety of fields including engineering, biological sciences, agriculture and business. I am also active in the areas of statistical decision theory, data analysis and sample surveys with particular interest in appropriate and efficient use of prior information in these areas.

In addition to the conferences and seminars that I have listed below, I have given numerous talks at various places, including the University of California Davis, the University of New Mexico, Duke University, University of Michigan, Imperial College, London, University of Minnesota and Georgia Tech. I have developed and presented short courses for High School teachers and engineers as well as interested lay people.

Presently I am quite active in research collaboration with several colleagues around the world. These papers include survey sampling, sequential design, selection and ranking methods, reliability testing, and clinical trials. This work continues much of my activity over the past 10 years.

Major Journal Articles

1. (Deely, J. J. and Gupta, S. S.), "On the properties of subset selection", *Sankhyā*, Series A, (1968), **30**, (37–47).
2. (Deely, J. J. and Kruse, R. L.), "Construction of sequences estimating the mixing distributions", *Annals of Math. Statist.*, **39** (1968), (268–288).
3. (Deely, J. J. and Zimmer, W. J.), "Some comparisons of Bayesian and classical confidence intervals in the exponential case", *Annals of Assurance Sciences*, **1**, No. 2 (1968), (366–371).
4. (Deely, J. J. and Zimmer, W. J.), "Partial prior information and shorter confidence intervals", *Annals of Assurance Sciences*, **2** (1969), (488–496).
5. (Kruse, R. L. and Deely, J. J.), "Joint continuity of monotonic functions", *American Mathematical Monthly*, **76**, No. 1 (1969), (74–76).
6. (Deely, J. J. and Zimmer, W. J.), "Shorter confidence intervals using prior observations", *Journal of the American Statistical Association*, **64**, No. 325 (1969), (378–386).
7. (Deely, J. J. Amos, D. E. and Steck, G. P.), "The exceedance test for truncation of a supplier's data", *Journal of the American Statistical Association*, **64**, No. 327 (1969), (823–829).
8. (Jackson, D. A., O'Donovan, T. M., Zimmer, W. J. and Deely, J. J.), " G_2 -minimax estimators in the exponential family", *Biometrika*, **57** No. 2 (1970), (439–443).
9. (Deely, J. J., Tierney, M. S. and Zimmer, W. J.), "On the usefulness of the maximum entropy principle in the Bayesian estimation of reliability", *IEEE Trans. Rel.*, **R-19**, No. 3 (1970), (110–115).
10. (Deely, J. J.), "Decision theory — an introduction", *New Zealand Statistician*, **7**, No. 3 (1972), (49–59).
11. (Deely, J. J.), "What is Bayesian statistics?", *New Zealand Operational Research*, **2**, No. 2 (1974), (108–132).
12. (Deely, J. J. and Zimmer, W. J.), "Asymptotic optimality of the empirical Bayes procedure", *Annals of Statistics*, **4**, No. 3 (1976), (576–580).

13. (Smith, M. H. and Deely, J. J.), "A secretary problem with finite memory", *Journal of the American Statistical Association*, **70**, No. 350 (1975), (357–361).
14. (Deely, J. J.), "Confidence intervals — what are they and what is their relevance to quality?", *Proceedings of the New Zealand Quality Conference*, (1980), (T6(1–13)).
15. (Rosenberg, W. J. and Deely, J. J.), "The horse-racing problem — A Bayesian approach", *The American Statistician*, **30**, No. 1 (1976), (26–29).
16. (Deely, J. J.), "Concerning minimum standards for sample surveys and the role of the NZ Statistical Association", *The New Zealand Statistician*, **15**, No. 1, May 1980, (14–24).
17. (Deely, J. J. and Lindley, D. V.), "Bayes Empirical Bayes", *Journal of the American Statistical Association*, **76**, No. 376 (1981), (833–841).
18. (Trainor, Luke and Deely, J. J.), "Surveying voting behaviour in New Zealand: Papanui 1978", *Political Science*, **33**, No. 1, July 1981, (20–32).
19. (Mara, M. K. and Deely, J. J.), "Empirical Bayes with a changing prior", *Ann. Statist.*, **12**, No. 3 (1984), (1071–1078).
20. (Zimmer, W. J. and Deely, J. J.), "T-minimax: still conservative when viewed from hierarchical Bayes", *Proceedings Decision Science Institute Annual Meeting*, (1987), (1099–1102).
21. (Loader, C. R. and Deely, J. J.), "Computations of boundary crossing probabilities for the Wiener process", *Journal of Statistical Computation & Simulation* **27**, No. 2 (1987), (95–105).
22. (Berger, J. O. and Deely, J. J.), "A Bayesian approach to ranking and selection of related means with alternatives to AOV methodology", *Journal of the American Statistical Association*, **83** (1988), (364–373).
23. (Deely, J. J. and Zimmer, W. J.), "Choosing a quality supplier — a Bayesian approach", *Bayesian Statistics 3*, Oxford Press, (1988), (585–592).
24. (Lindley, D. V. and Deely, J. J.), "Optimal allocation in stratified sampling with partial information" (1993), *Test*, **2**, (147–161).
25. (Deely, J. J. and Keats, J. B.), "Bayes stopping rules for reliability testing with the exponential distribution", *IEEE Transactions on Reliability*, **43**, No. 2 (1994), (288–293).
26. (Lad, F. R. and Deely, J. J.), "A subjective utilitarian view of experimental design. [Aspects of Uncertainty: A Tribute to D. V. Lindley], edited by A. F. M. Smith, London: John Wiley, (1994), (267–281).
27. (Lad, F. R., Deely, J. J. and Piesse, A.), "Coherency conditions for finite exchangeable inference", *Journal of the Italian Statistical Society*, **4**, (1995), (195–213).
28. (Zimmer, W. J. and Deely, J. J.), "A Bayesian ranking of survival distributions using accelerated or correlated data", *IEEE Transactions on Reliability* **45**, No. 3, (1996), (499–504).
29. (Deely, J. J. and Johnson, W. O.), "Normal means revisited" [Advances in Statistical Decision Theory and Applications], edited by S. Panchapakesan and N. Balakrishnan, Boston: Birhauser (1997) (19–30).
30. (Tandberg, D., Deely, J. J., and O'Malley, A. J.), "Generalized likelihood ratios for quantitative diagnostic test scores", *American J. Emer. Med.*, **15**, No. 7, (1997),

(694–699).

31. (Schluter, P. J., Deely, J. J. and Nicholson, A. J.), “Ranking and selecting motor vehicle accident sites using a hierarchical Bayesian model”, *J. Roy Stat. Soc. D*, **46**, No. 3, (1997), (293–316).
32. (Duffull, S. B., Begg, E. J., Robinson, B. A. and Deely, J. J.), “A sequential Bayesian method for analysis of carboplatin dose individualization”, *Cancer Chem. Pharmacol.*, **39**, (1997), (317–326).
33. (Deely, J. J. and Smith, A. F. M.), “Quantitative refinements for comparisons of institutional performance, *J. Roy. Stat. Soc. A*, **161**, Part I, (1998), (5–12).
34. (Duffall, S. B. Begg, E. J. and Deely, J. J.) “Development of a new method of optimal sampling for the determinations of AVC with an application for Carboplation”, *European J. Clin. Pharmacol.*, **55**(3), (1999), (213–219).
35. (Deely, J.J. and Sahinoglu, M.) “Bayesian measure to assess predictive accuracy of software reliability methods” Proceedings of the Ninth International Symposium on Software Reliability Engineering, (1998), (139–148).
36. (Sahinoglu, M., Deely, J. J. and Capar, S.) “Stochastic Bayes measures to compare forecast accuracy of software reliability models”, *IEEE Transactions on Reliability*, **50**, No. 1 (2001), (92–97).
37. (O’Malley, A. J. and Deely, J. J.) ”Bayesian measures of the minimum detectable concentration of an immunoassay”. *Australian and New Zealand Journal of Statistics*, **45**(1), (2003), (43–65).
38. (Johnson, B. C. and Deely, J. J.) “Minimum risk, fixed cost sampling designs for independent Poisson processes”. *Survey Methodology*, **29**(1), (2003), (91–97).
39. (Deely, J. J.), “Comparing two groups or treatments – a Bayesian approach,” in *Applied Bayesian Statistical Studies in Biology and Medicine*, Kluwer Academic Publishers (2003).
40. (Hashemi, Z.K., Oshida, Y, Deely, J.J. and Ki, Y.), ”Ca/P Mol Ratio of Cries - Affected Dentin Structures”, *Journal of Bio-Medical Materials and Engineering*, **15**(4), (2005), (251-260).
41. (Deely, J.J. and Johnson, W.O.), ”Inferences for hierarchical models with partial prior information”, *Journal of Statistical Planning and Inference*, **136**(7), (2006), (2327-2339).
42. (Deely, J.J.) ”A Tribute to Shanti S. Gupta”, *Journal of Statistical Planning and Inference*, **136**(7), (2006), (1999-2003).

Research Reports and Published Discussions

1. (Deely, J. J.), “Accuracy and confidence of power spectra measurements”, (1961), Computation Division Report, Air Force Missile Development Center, Holloman Air Force Base, New Mexico.
2. (Deely, J. J.), “Mathematics of reliability”, (1963), appendix in Naval Avionics Facility at Indianapolis Reliability Training Manual.
3. (Deely, J. J.), “Multiple decision procedures from an empirical Bayes approach”, (1965), Department of Statistics, Mimeo Series 45, Purdue University.

4. (Deely, J. J.), "Sequential selection of the best of k -populations", (1966), Department of Statistics, Mimeo Series 91, Purdue University.
5. (Deely, J. J., Tierney, M. S. and Zimmer, W. J.), G -minimax estimators", Sandia Laboratories Research Report SC-RR-68-359 (1968), Albuquerque, New Mexico.
6. (Deely, J. J., Discussion of "Highly informative priors" by E. T. Jaynes in *Bayesian Statistics* edited by Bernardo, De Groot, Lindley & Smith, (1985), North Holland, pp. 352, 353.
7. (Deely, J. J.), "Discussion of a Bayesian model and a graphical elicitation procedure for multiple comparisons" by W. DuMouchel in Proceedings of the Third Valencia International Meeting, June 1-5, 1987, *Bayesian Statistics 3* edited by Bernardo, DeGroot, Lindley and Smith (1988), Oxford Press, p. 143, 144.
8. (Deely, J. J. and Gupta, S. S.), "Hierarchical Bayesian selection procedures for the best binomial population", Purdue University Department of Statistics, Technical Report #88-21C (1988).
9. (Deely, J. J.), Discussion of "Advances in Bayesian experimental design" by I. Verdinelli in Proceedings of the Fourth Valencia International Meeting, April 15-20, 1991. In *Bayesian Statistics 4*, Oxford, 1992: pp. 1056-1058.
10. (Deely, J. J. and Chacko, E.), "Lecture Notes for Workshop for ECNZ, Statistics and Hedging, June 1994.
11. (Deely, J. J.), "Introduction to "Bayes estimates for the linear models" by D.V. Lindley and A.F.M. Smith in *Breakthroughs in Statistics Volume III* edited by Johnson and Kotz (1997), Springer, p. 257-262.

Books

1. (Deely, J. J.), "Elementary statistics for engineers", (1964), unbound text printed for engineers at the Naval Avionics Facility at Indianapolis.
2. (Deely, J. J.), "Statistics and Society Course Supplement", (2002), Hayden-McNeil.

Papers in Progress

1. (Deely, J. J.), "Interim analysis using the concept of further assurance".
2. (Deely, J. J.), "A Bayesian approach to statistical interaction".

Supervised Theses

Ph.D.

Smith, M. H. (1977), "Some Best Choice Problems with Uncertain Recall".

Mara, M. K. (1979), "Empirical Bayes with a Changing Prior".

Edwards, H. P. (1980), "Bayes Sequential Design Procedures: Theory and Applications".

Heffernan, P. M. (1980), "Linear Location Estimators: the Dependence of their Quality on the Shape of the Probability Density Function, and their Robustness".

- Schluter, P. J. (1996), "Model Selection and Model Adequacy Considerations".
- Piesse, A. (1996), (jointly with Lad, F. R.), "Inference Problems using Coherency, Empirical Bayes and other Strategies".
- Duffall, S. B. (1998), (jointly with E. J. Begg), "Dose Individualization of Carboplatin and Gentamicin Bayesian Methodology"
- O'Malley, A. J. (1998), (jointly with M. H. Smith), "Some New Considerations for the Statistical Analysis of an Assay".

M.Sc.

- Henry, P. B. (1973), "Bayesian Confidence Intervals in the Exponential Case".
- Kingh, Nguyen (1973), "A Study of Sequential Design Problems".
- Dawes, E. G. (1975), "Variable Reduction Techniques in Multiple Linear Regression".
- Edwards, H. P. (1976), "Multiple Decision Procedures for Selecting the Best of k Normal Populations".
- Lo, Ming Hua (1976), "Minimum Path Problems under Incomplete Information".
- Mara, M. K. (1976), "Rates of Convergence in Empirical Bayes Decision Problems".
- Mobley, M. C. (1976), "A Selection Procedure for Samples with Missing Data from Multivariate Populations".
- Freeman, S. P. (1980), "A Study of Minimum Sample Size for Central Limit Theorem Estimation".
- Peiris, S. (1985), "A New Preference Function to Analyze Repeated Measurements Data".
- Sathiyandra, Gurusingham (1990), "Bayesian Forecasting for the General Linear Model".
- Schluter, P. J. (1992), "A Hierarchical Bayesian Interpretation of Motor Vehicle Accidents".

Conferences, Seminars and Presentations

- Invited discussant to three Valencia International Bayesian conferences (1983, 1987, 1991).
- Participant at Practical Bayesian Statistics Conference at Cambridge (1986).
- Invited speaker for SIBES in Riverside California; "Selecting the best Growth Curve" (1986).
- Attendee, Conference in honour of de Finetti, Innsbruck (1986).
- Invited participant SIBES at Ohio State University; "Selecting the Best Treatment using Hierarchical Bayesian Methods" (1986).
- Conference in honour of I. J. Good at Blacksburg Virginia (1987).

Invited speaker to Los Alamos National Laboratory; “Hierarchical Bayesian methods in AOV” (1989).

Invited speaker to SIBES in Washington, DC; “Coherency Conditions for Finite Exchangeable Inference” (1990).

Attendee at Robust Bayesian Conference, Milano (1992).

Invited Speaker Fifth Purdue Symposium on Statistical Decision Theory and Related Topics, Purdue University, “Bayesian sequential design for selecting the better treatment using a conservative influence of future observations” (1992).

Invited speaker First World Meeting of International Society for Bayesian Analysis, San Francisco, “Selecting the best design in certain partially exchangeable models” (1993).

Invited speaker Conference in Honour of Dennis Lindley, University College, London, “Experimental design and subjective utility” (1993).

Invited discussant to 1st Riverboat Conference on Bayesian Econometrics and Statistics, Basel, Amsterdam (1993).

NZSA Conference, University of Canterbury; “Selecting the best of several treatments using the Gibbs sampler” (1993).

Invited speaker Conference in Honour of Shanti Gupta, Purdue University, “Normal Means Revisited” (1994).

Invited speaker 48th Meeting of SIBES jointly with North American Regional International Society for Bayesian Analysis, Toronto, “Bayesian stopping rules using further assurance” (1994).

Invited speaker 50th Meeting of International Statistical Institute, Beijing, “Robust Bayesian Selection Methods” (1995).

Invited speaker to 3rd World Meeting, Oaxaca, Mexico, International Society for Bayesian Analysis, “Robust Bayesian Selection of the Better of Two Supplies” (1995).

Invited speaker, International Society for Bayesian Analysis, North American Meeting, Chicago, “Bayesian Selection of the Better Treatment Using Further Assurance” (1996).

Contributed paper at Fifth World Meeting of International Society for Bayesian Analysis at Istanbul, “Bayesian and Robust Bayesian Selection of the Best Binomial Population” (1997).

Invited to chair a session at Sixth Valencia International Meeting on Bayesian Statistics at Las Fuentes, Spain (1998).

Contributed paper and chairperson at Sixth Purdue Symposium on Statistical Decision Theory and Related Topics, “A Robust Bayesian Approach to Pr (Dose A is better than Dose B) in a Logistic Regression Model” (1998).

Invited to chair a session at Seventh Valencia International Meeting on Bayesian Statistics at Tenerife, Spain (2002).

Invited guest lecturer at Summer School “Inferenza Statistica in Biologia Umana” in Asti, Italy (2002), (2003), (2004), (2005), (2006).

Honours and Awards

Elected member, Eta Kappa Nu (1954).

NSF Summer Institute in Statistics at the University of Florida (1960).

NSF Summer Institute in Statistics at Oklahoma State University (1962).

Study leave (ten months) University of Canterbury; Visiting Professor in Department of Mathematics & Statistics at University of New Mexico (1974).

Erskine Fellowship from University of Canterbury (1983).

Study leave (one year) University of Canterbury; Visiting Professor in Department of Statistics at Purdue University (1986).

Invited Participant Warwick Study Year, Warwick University, (Summer 1986).

Invited participant to Bayesian Hierarchical Methods at Bowling Green University (1986).

Visiting research appointment, Purdue University (Nov. 1987).

Erskine Fellowship University of Canterbury (1989).

Study leave (9 months) University of Canterbury; Visiting Professor in Department of Statistics at Purdue University, (1991), Dept. of Statistics, University of California at Davis, (1992).

Erskine Fellowship University of Canterbury (1995).

Professor Emeritus, University of Canterbury (1996).

David S. Moore Outstanding Teacher Award (2004).

Sponsored Research Projects

New Zealand National Roads Board: to conduct research into viability of traffic counting and predicting annual traffic flow for various road types; examine their data base, design, oversee gathering of future data as necessary (1983–1990).

Christchurch Airport Authority: to obtain information on potential tourist traffic for use of the Christchurch airport; to ascertain what potential passenger traffic could use the Christchurch Airport for International flights (1984–1985).

University of Canterbury Research Grant \$9,500 to study Hierarchical Bayesian methods for selecting the best supplier (1989).

University of Canterbury Research Grant (jointly with Rick Beatson) \$18,000 for computational server to allow further research numerical solutions of Bayesian models (1993).

New Zealand Apple and Pear Board: to investigate and produce forecasting methods with correspondent confidence levels for each region and each variety; investigate the data base and advise as to its quality (1989–1994).

Canterbury TV: to perform audience research and to indicate what audience and how much viewing is done by a reasonably small group of viewers (1991).

Justice Department, Psychological Services: to derive models for predicting frequency and seriousness of re-offending (1993–1996).

Health Benefits Centre, Christchurch: to ascertain, develop and implement models for determining amount of health care given in each month based on global claim data (1993–1997).

Customer Satisfaction Index of New Zealand Ltd: analysis of survey data to produce indices of customer attitudes (1996).

Statistical Consulting for Business

Hawkes Bay Farmers Meat Co. — obtaining an accurate indication of farmer attitudes and potential to increase their numbers of stock if adequate freezing works capacity were available. Appeared as an expert witness to support claims and to criticize competitive studies (1972–1973).

Hawkes Bay Farmers Meat Co. — to produce a more accurate method to predict the amount of wool on lambs and sheep brought to slaughter (1980–1982).

Waitaki Freezing Works — to predict the number of stock requiring slaughter-house facilities six months in advance (1983–1984).

Medical Clinic — conducted survey to understand community attitudes towards physiotherapists and other medical opinions (1989).

Trust Bank, New Zealand — modeling credit card behaviour, evaluating marketing strategies, analyzing past data.

School of Dentistry, Indiana University — have consulted with 19 dental students who required statistical methodology for protocols and analysis of experimental data required in completing their M.S. degree.

Appearance as Expert witness —

- (1) Analyze and produce a critique of the need for additional motorways in the city of Christchurch. Report produced by the Ministry of Transport (1985).
- (2) Provide analysis and critique of methods by the Ministry of Agriculture to predict the accuracy of labeling of fish cartons by Korean fishing boats in New Zealand waters (1990).
- (3) Examine and comment on an inner city survey of published attitudes towards expansion (1991).

Statistical Consulting in the Community

Local radio station required help to determine its listener audience to combat Government regulations (1971).

Assisted a local neighbourhood Citizens Association to obtain data and analyze the feasibility of a refuge station being located in their neighbourhood (1976).

Initiated and developed case for a Survey Appraisals Committee as a professional committee of the New Zealand Statistical Association. Served as Chairman of this committee for two years and served on the committee for several years (1976–1979).

Supervised and assisted local newspaper in performing a telephone survey to check popularity of political leaders (1977).

Assisted local High School class to obtain information on pollution levels in the community (1981).

Assisted local newspaper in determining its reader audience in order to refute statistics from national advertising organization (1983).

References Available Upon Request