

New book :

2009 - Data Mining with Neural Networks : A Guide for Statisticians
Editor : Textbook Revolution

Authors : **Basilio de Braganca Pereira (B de B Pereira) and**
Calyampudi Radhakrishna Rao (C R Rao)

Free download from :

<http://textbookrevolution.org/index.php/Book:Lists/Subjects/Mathematics>

Abstract

In this book we show that neural networks can be used to perform many statistical methods of data analysis. We show how neural networks are related to regression linear, logistic , nonparametric. Multivariate analysis:MDS,PCA, ICA, CA,Cluster as well as time series, survival analysis and control charts. Some classical and Bayesian statistical inference results are also pointed out.



Basilio de Braganca Pereira is Titular Professor of Biostatistics at the Faculty of Medicine (since 1998) and of Applied Statistics at the PosGraduate School of Engineering (COPPE/UFRJ), since 1970, both at the Federal University of Rio de Janeiro UFRJ. He has a B.Sc in Statistics (Escola Nacional de Ciências Estatísticas (1965-1968), M.Sc. (1970) and L.D. (1989) in Operational Research from (COPPE/UFRJ and he obtained a DIC .and PhD. degrees in Statistics from Imperial College Of Science Technology And Medicine, University of London (1972-1976)) under the supervision of one of the current top statisticians, Sir David R Cox. ,He was a Research Visitor at the

Penn State University (2003-2004) working at the Center of Multivariate Analysis with Professor CR Rao. Prof. Pereira currently is the coordinator of the Statistical research consulting group at The University Hospital of UFRJ and is a staff member of the graduate courses in Production Engineering, Cardiology and Clinical Research. His current teaching are Statistical Inference and Statistical Learning for graduate students of Operational Research and Bayesian Biostatistics and Multivariate Biostatistics for graduate students of Medicine. Up to date he supervised 19 PhD and 38 MSc students.

Calyampudi Radhakrishna Rao, known as C.R.Rao, is recognized internationally as one of the pioneers who laid the foundations of modern statistics, with a multifaceted distinction as a mathematician, researcher, scientist and teacher. His contributions to statistical theory and applications during the last six decades have become a part of graduate and post graduate courses in statistics, econometrics and electrical engineering at most of the universities throughout the world. Technical terms bearing his name, such as **Cramer-Rao inequality, Rao-Blackwellization, Rao Distance, Orthogonal Arrays, Rao's Score test, Hamming-Rao bound, Rao's Canonical Factor Analysis, Rao's F-Test, Rao's Quadratic Entropy, Rao's U-Test, Rao-Yanoi Inverse and Rao-Rubin, Geary-Rao, Kagan-Linnik-Rao, Lau-Rao and Shanbagh-Rao theorems**. appear in standard text books on statistics, econometrics and engineering .

. He has authored or co-authored 15 books, some of which have been translated into several European, Japanese and Chinese languages, and more than 300 research papers.

Rao received his Ph. D. degree from Cambridge University, UK in 1948 with the father of modern statistics, Sir Ronald Fisher as thesis advisor. Later, Cambridge University awarded him the Sc. D. degree in 1965, based on his overall contributions to statistical theory and applications. Up to date, **he received 32 honorary doctorate degrees from universities in 18 countries spanning six continents**. He directed the research work of 50 students for the Ph.D. degree in probability and statistics, who in turn produced 350 Ph.D.'s. He held important positions as Director of the Indian Statistical Institute, **National Professor and Jawaharlal Nehru Professor in India**, University Professor at the University of Pittsburgh and Eberly Professor of Statistics at the Pennsylvania State University in USA.

Rao received numerous international awards for his fundamental contributions to statistical theory and applications. **He is a member of the National Academies of Sciences of USA, India and Lithuania, and American Academy of Arts and Science; Fellow of Royal Society, UK and the Third World Academy of Sciences; Life Fellow of King's College, Cambridge.**

He received the second highest civilian award *Padma Vibhushan* from the government

of India., which also instituted a cash prize in his honor to be awarded once in two years to a young statistician. For his outstanding achievements, C.R.Rao has been honored with the establishment of an institute in Hyderabad named after him: C.R.Rao Advanced Institute of Mathematics, Statistics and Computer Science.

He received the Guy medal in silver of Royal Statistical Society, Wilks medal of ASA, Army Wilks medal, Saha and Ramanujan medals of Indian National Science Academy, Mahalanobis medal of Indian Science Congress, Mahalanobis International Award for lifetime achievement, and J.C.Bose medal of Bose institute.

Rao was honored by the president of USA with the National Medal of Science, the highest award given to a scientist for lifetime achievement in scientific research.

Rao is featured in the publications: *Faces of Science* and *Figures from the History of Probability and Statistics* and also listed in the website, *amstat.org.statisticians in*

Times of India dated 31 December 1988 chose **C.R. Rao as one of the 10 top scientists of India**; the list includes the outstanding scientists, J.C. Bose, S.N. Bose, S. Ramanujan, Harishchandra, H. Khurana, C.V. Raman, S. Chandrasekhar, Salim Ali and G.N. Ramachandran. (**four Nobel laureates and the math genius Ramanujan**).

Among several conferences held honoring him, in December 2010, at the AIMSCS-C.R.Rao Advanced Institute of Mathematics, Statistics and Computer Science, the International Conference on the Frontiers of Interface of Statistics and Science will honor CR Rao , the living legend who will be attaining the age of 90 in 2010