

CREATING A REAL IMPRESSION: VISUAL STATISTICAL ANALYSIS

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ABSTRACT

Many powerful statistical methods available for studying simulation output are under-appreciated and consequently under-used, because they are considered to be hard-to-understand, arcanelly mathematical, and hard to implement. Such methods can invariably be implemented using data-driven resampling methods, making their underlying rationale quite transparent. There is little need for much formal mathematics, and what there is can be made visually obvious, with method and results explained and presented using figures and graphs, often with dynamic animation. This approach in studying simulation output will be illustrated by a number of examples drawn from simulation studies and real applications. A bonus of the approach is that it is quite easy to create one's own 'bespoke' method of analysis tailored to a particular problem. Such examples will be presented and analyzed in 'real-time' in the talk itself, enabling the results to be immediately displayed.

AUTHOR BIOGRAPHY

RUSSELL CHENG is Emeritus Professor at Southampton having been Professor of Operational Research and Head of the OR Group from 1999 to 2007, in the School of Mathematics. He obtained an MA from Cambridge University, and a PhD from the University of Bath. He was previously Deputy Director of the Institute of Mathematics and Statistics and Head of Management Science at the University of Kent at Canterbury. His research interests have been in: Design and Analysis of Simulation Experiments, Non-standard Parametric Estimation, Computer Generated Graphics, Optimal Control of Industrial Processes, and Marine Simulation. He is a former Fellow of the Royal Statistical Society, a Fellow of the Institute of Mathematics and Its Applications, and is a past Chairman of the United Kingdom Simulation Society. He is a past Board Member of EUROSIM, the Federation of Simulation Societies in Europe. He has been an Associate Editor of *Management Science* and was Joint Editor of the *IMA Journal of Mathematics Applied in Business and Industry*, and then founding Editor of the *IMA Journal of Management Mathematics* for which he received, in 2008, the IMA's Certificate of Service. He was Council member of the INFORMS Simulation Society (2006-08) and received the Society's Distinguished Service Award in 2007 and Lifetime Professional Achievement Award in 2016. He was the Consultant Research Director of *Norcontrol Imaging Systems Ltd*, a subsidiary of *Norcontrol a.s.*, the largest manufacturer of marine simulators world-wide. He is author of the book *Non-Standard Parametric Statistical Inference* published in 2017 by Oxford University Press. He is currently a course lecturer in the UK's National Taught Course Centre in Operational Research (NATCOR) which delivers nationwide residential courses to UK research students in OR and Management Science.