

# Uncertain Judgements: Eliciting Experts' Probabilities

By Anthony O'Hagan, Caitlin E. Buck, Alireza Daneshkhah, J. Richard Eiser, Paul H. Garthwaite, David J. Jenkinson, Jeremy E. Oakley, Tim Rakow



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Elicitation is the process of extracting expert knowledge about some unknown quantity or quantities, and formulating that information as a probability distribution. Elicitation is important in situations, such as modelling the safety of nuclear installations or assessing the risk of terrorist attacks, where expert knowledge is essentially the only source of good information. It also plays a major role in other contexts by augmenting scarce observational data, through the use of Bayesian statistical methods. However, elicitation is not a simple task, and practitioners need to be aware of a wide range of research findings in order to elicit expert judgements accurately and reliably. *Uncertain Judgements* introduces the area, before guiding the reader through the study of appropriate elicitation methods, illustrated by a variety of multi-disciplinary examples.

# This is achieved by:

- Presenting a methodological framework for the elicitation of expert knowledge incorporating findings from both statistical and psychological research.
- Detailing techniques for the elicitation of a wide range of standard distributions, appropriate to the most common types of quantities.
- Providing a comprehensive review of the available literature and pointing to the best practice methods and future research needs.
- Using examples from many disciplines, including statistics, psychology, engineering and health sciences.
- Including an extensive glossary of statistical and psychological terms.

An ideal source and guide for statisticians and psychologists with interests in expert judgement or practical applications of Bayesian analysis, *Uncertain Judgements* will also benefit decision-makers, risk analysts, engineers and researchers in the medical and social sciences.

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# **Editorial Review**

# Review

"This book, written by a group of expert statisticians and psychologists, provides an introduction to the subject and a detailed overview of the existing literature. The book guides the reader through the design of an elicitation method and details examples from a cross section of literature in the statistics, psychology, engineering and health sciences disciplines." (*Zentralblatt Math*, 1 August 2013)

"This is an interesting, well-written book that will be valuable to any decision maker who much rely on expert judgments, any statistician who uses Bayesian statistics, and any researcher who wishes to understand the field of elicitation." (*Journal of the American Statistical Association*, March 2009)

"This book provides an excellent introduction and working reference to the subject of its title and should be an invaluable aid to producers and consumers of expert opinion." (*Biometrics*, September 2008)

"I recommend 'Uncertain Judgements' as an excellent source for a wide variety of research." (*Psychometrika*, March 2008)

"...will be of interest to those who are concerned with or interested primarily in the practicalities of modeling expert judgement and opinion." (*International Journal of Marketing*, January 2007)

# From the Back Cover

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engineers and researchers in the medical and social sciences.

#### About the Author

**Professor Anthony O'Hagan** is the Director of The Centre for Bayesian Statistics in Health Economics at the University of Sheffield. The Centre is a collaboration between the Department of Probability and Statistics and the School of Health and Related Research (ScHARR). The Department of Probability and Statistics is internationally respected for its research in Bayesian statistics, while ScHARR is one of the leading UK centres for economic evaluation.

Prof O'Hagan is an internationally leading expert in Bayesian Statistics.

Co-authors:

Professor Paul Gathwaite - Open University, Prof of Statistics, Maths and Computing

Dr Jeremy Oakley - Sheffield University

Professor John Brazier - Director of Health Economics Group, University of Sheffield

Dr Tim Rakow - University of Essex, Psychology Department

Dr Alireza Daneshkhah – University of Sheffield, Medical Statistics Department

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