Alison Harcourt Citation (Honorary Doctorate in Science)

Alison Harcourt (nee Doig) is a true pioneer in the mathematical field of optimisation, having co-authored the seminal paper: A. H. Land and A. G. Doig, "An Automatic Method of Solving Discrete Programming Problems", *Econometrica,* vol. 28, no. 3, 1960.

This ground-breaking paper is well-known to researchers in optimisation since it proposed a method for solving integer programming problems which later became known as the "branch-and-bound" method. It underpins much of modern day optimisation software packages that provide efficient solutions to challenging combinatorial optimisation problems. Applications are diverse and range from logistics and transportation, to scheduling, to telecommunications, and even cancer radiotherapy treatment planning. This seminal paper has almost 3000 Google Scholar citations and has clearly had enormous impact in the academic literature as well as for practical problem solving for economic and social benefits.

Most people are not aware that this landmark paper was written by two women, since their first names are never identified. The paper was co-authored by Alison and Ailsa Land, both research assistants at the London School of Economics. She was offered the position based on the quality of her University of Melbourne Master's thesis on integer linear programming in the mid-1950s. Alison never enrolled in a PhD, had career interruptions for child-raising and, by the mid-1960s, returned to the University of Melbourne to take up a position as a Senior Lecturer in Statistics. Her talents were in high demand as a statistical collaborator, and she went on to have a strong career as a statistician, never returning to work in the field of optimisation for which she had provided such important foundations.

Alison's statistical analyses have had profound impacts influencing government policy. Examples include the first attempts to estimate poverty in Australia (informing the Royal Commission of Inquiry into Poverty); and statistical analysis of bias that lead to an amendment of the Commonwealth Electoral Act in 1984 which introduced a "double randomisation" method for allocating positions of candidates on ballot papers (still used today). She was also foundation secretary of the Victorian branch of the Statistical Society of Australia (1963-1967), and has authored several books and journal articles. She formally retired in 1994 but continues to share her passion for teaching as a sessional tutor in mathematics and statistics at The University of Melbourne at the age of eighty-eight.

Given the seminal nature of her work that laid the foundations for an entire field with major societal impact, and her additional contributions in the field of applied statistics with significant societal impacts, an Honorary Doctorate from The University of Melbourne is the best way we can honour the achievements of this pioneer.