Kate Smith-Miles

Kate Smith-Miles is a Melbourne Laureate Professor in Applied Mathematics, and Pro Vice-Chancellor (Research Capability) at the University of Melbourne. She is also Director of the ARC Training Centre in Optimisation Technologies, Integrated Methodologies and Applications (OPTIMA).

Kate has published around 300 refereed journal and international conference papers in the areas of neural networks, optimisation, machine learning, and various applied mathematics topics. She has supervised to completion over 30 PhD students, and has been awarded over AUD$20 million in competitive grants, including a Georgina Sweet ARC Laureate Fellowship. She has received medals for her research from the Australian Mathematical Society (AustMS), the Australian and New Zealand Industrial and Applied Mathematics Society (ANZIAM), and the Australian Society for Operations Research (ASOR). Kate is a Fellow of the Australian Academy of Science, the Institute of Engineers Australia and the AustMS.

She was President of the AustMS from 2016-2018, and was a member of the Australian Research Council's College of Experts from 2017-2019. She also regularly acts as a consultant to industry in the areas of optimisation, machine learning, and mathematical modelling.

Title:
Optimization in the Darkness of Uncertainty: when you don't know what you don't know, and what you do know isn't much!

Abstract:
How do we find the optimal solution for a constrained multi-objective optimisation problem when we have no analytical expression for the objective functions, and very limited function evaluations within the huge search space due to the expense of measuring the objective functions? Calculus can’t help you, and trial and error is not an option! This talk will describe a common practical optimisation problem found in many industrial settings with these challenges, and introduce some methods for expensive black-box optimisation. Finally, we will address the question of how best to evaluate the performance of such methods by generating new test instances with controllable characteristics.