



Department of Advanced Design  
and Systems Engineering

香港城市大學  
City University of Hong Kong

# Distinguished ADSE Seminar Series

## Improving Sample Average Approximation Using Distributional Robustness



### Professor Andy Philpott

University of Auckland, New Zealand  
(joint work with Eddie Anderson,  
Imperial College/University of Sydney)

**10 MAR 2022 (Thu)**  
**10:30 am**

Seminar Link: <https://cityu.zoom.us/j/93867507925>

Meeting ID: **938 6750 7925**



Enquiry: 3442 8422  
All are welcome

#### Abstract

We consider stochastic optimization problems in which we aim to minimize the expected value of an objective function with respect to an unknown distribution of random parameters. We analyse the out-of-sample performance of solutions obtained by solving a distributionally robust version of the sample average approximation problem for unconstrained quadratic problems and derive conditions under which these solutions are improved in comparison with those of the sample average approximation. We compare different mechanisms for constructing a robust solution:  $\phi$ -divergence using both total variation and standard smooth  $\phi$  functions and a CVaR-based risk measure.

#### About the Speaker

Andy Philpott is Professor of Operations Research and co-director of the Electric Power Optimization Center at the University of Auckland. His research interests are in stochastic optimization and game theory and their application to electricity markets. Dr Philpott currently serves on the editorial board of Operations Research, and has previously served on the editorial boards of Mathematical Programming and Operations Research Letters. Dr Philpott is an Edelman Laureate and a Fellow of INFORMS.