Colloquium Series

MACQUARIE University

School of Mathematical and Physical Sciences 9 September 2022

Date: Friday, 9 September 2022

Time: 10:00am – 11:00am

Speaker: Professor Kate Smith-Miles (University of Melbourne)

Venue: Hybrid – In-person at Macquarie University and Zoom

Title: Stress-testing algorithms via Instance Space Analysis

Abstract: Instance Space Analysis (ISA) is a recently developed methodology to support objective testing of algorithms. Rather than reporting algorithm performance on average across a chosen set of test problems, as is standard practice, ISA offers a more nuanced understanding of the unique strengths and weaknesses of algorithms across different regions of the instance space that may otherwise be hidden on average. It also facilitates objective assessment of any bias in the chosen test instances, and provides guidance about the adequacy of benchmark test suites and the generation of more diverse and comprehensive test instances to span the instance space. This talk provides an overview of the ISA methodology, and the online software tools that are enabling its worldwide adoption in many disciplines. A case study comparing algorithms for university timetabling is presented to illustrate the methodology and tools, with several other applications to machine learning, computer vision and quantum computing highlighted.