

# WINMEE 2016

**Professor Violet Syrotiuk**

Arizona State University

**Title:**

Screening Experiments: Do Interactions Matter?

**Abstract:**

The objective of a screening experiment is to determine which factors significantly affect a system's response. This information may be used for response characterization. An empirical model developed may, in turn, be used for optimization of the response. In this talk, we survey some traditional designs for screening experiments and identify some of their weaknesses in screening complex engineered systems. In particular, it is not typical to screen for interactions in order to keep the number of runs in the experiment feasible. Yet in many complex engineered systems, such as in computer networks, interactions among factors are known to influence responses such as throughput, delay, and jitter. We introduce locating arrays (LAs) as a new screening design that efficiently screens interactions. We use an LA to screen the responses of exposure and mean opinion score (MOS) in an audio streaming application on the w-iLab.t wireless testbed in Belgium. We conclude with some open problems in the development of rigorous scientific methods for designing and assessing experiments.