

## SYSTEM DYNAMICS MODELLING ARCHETYPES AND SECURITY



### Speakers:

**Dr. Ivan Taylor**

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**Date:** December 16th, 2024

**Time:** 10:00 AM - 11:00 AM

**Zoom Meeting ID:** 895 3587 6994

**Passcode:** 506257

### ABSTRACT

This presentation examines the application of System Dynamics Modelling (SDM) archetypes to security, incorporating both defensive and offensive perspectives. By exploring archetypes such as Shifting the Burden, Tragedy of the Commons, Drifting Goals, Fixes that Fail, Accidental Adversaries, and Limits to Success, we identify patterns that can lead to unintended negative consequences in cybersecurity operations. Using Causal Loop Diagrams (CLDs), the presentation illustrates how positive and negative causal influences create reinforcing and balancing feedback loops within security systems. We highlight the importance of systemic thinking in strategic planning through real-world examples—including how quick defensive fixes may lead to long-term vulnerabilities and how offensive actions can inadvertently undermine attackers' objectives. Emphasizing a focus on root causes rather than temporary solutions, the presentation advocates for a holistic approach to security that anticipates potential pitfalls and encourages collaboration across teams to address complex challenges effectively.

### BIOSKETCH

Ivan Taylor is the Senior Researcher in System Dynamics at Policy Dynamics Inc. in Ontario, Canada. He has a PhD in Public Policy, an MSc in Information and Systems Science, and a BSc in Mathematics. He spent over 33 years in the Centre for Operational Research and Analysis in Defence Research and Development Canada. He has been a Canadian Operational Research Society member since 1979 and was President of the Ottawa Chapter in the mid-1980s. He has been a member of the System Dynamics Society (SDS) since 1997 and is currently a mentor in the One-on-One Mentoring Program of the SDS, working with young people worldwide.