# Cognitive Learning and Decision Making for EW

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ABSTRACT

Modern mobile communications networks operate in highly dynamic, potentially hostile environments. Current approaches to selecting Electronic Protect (EP) and Electronic Attack (EA) actions tend to be limited to previously-seen RF environments, and therefore perform poorly against novel conditions. It is instead desirable to adaptively configure the radio to maintain consistent communications. Our goal is to automatically select actions that improve mission performance, even in highly-dynamic or novel RF environments. Our *Strategy Optimizer* adaptively selects a configuration in real-time, and cognitively learns how to handle new communications environments during the mission. The Strategy Optimizer is multi-threaded, allowing parallel decision making and learning, and semantically-agnostic (i.e., it uses no labels), supporting easy deployment to new platforms and domains.

PRESENTER BIOGRAPHY

Dr. Karen Zita Haigh is a research leader in cognitive RF with a focus on Machine Learning. She was the lead designer of the cognitive controller that became the first known real-world system (not simulation) to use machine learning to dynamically control radio behavior. Dr. Haigh has participated in many DARPA programs including CommEx, Integrated Learning, ACERT, and Self-Regenerative Systems. Dr. Haigh has led cognitive control research at BBN Technologies and Honeywell Laboratories in EW, MANET, cyber security, the International Space Station, aircraft engines, and the homes of elders. She has numerous patents and publications in the fields of behavior modeling, anomaly detection and distributed control. Dr. Haigh obtained her Ph.D. in Computer Science from Carnegie Mellon University in 1998.

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