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Jon C Haass

Embry-Riddle University, USA

Advances in machine learning for intrusion detection

Machine learning methods show promise in reducing the number of network analysts required to monitor a large complex network for malicious or anomalous activity. This would potentially free humans to perform other tasks such as mitigation, recovery and analysis of the attack or malware. Today, false positives, inherent in any detection system, wastes precious resources. To utilize machine learning techniques, to improve both issues; sensor data or variables must be pre-processed in some manner to provide input to the learning system. Deep neural nets have demonstrated success of artificial intelligence methods in restricted domains, however, in cyber security applications the problem space is essentially unbounded. Further, the adversary seeks to foil detection. This presentation will briefly look at techniques and problems that have led to our current understanding and solutions. Notable progress by researchers has improved performance in the past several years. Some solutions are being brought to market by startup companies spun off from academic research. A review of two promising approaches will be followed by a discussion of a model that identifies critical variables and sensory input to feed into a learning network. The challenges faced in this project and directions for future research to improve the detection rate and response to changing attack models will conclude the talk.

Biography

Jon C Haass has received his PhD from MIT in Applied Mathematics and continued as a CLE Moore Instructor before starting his first company in the field of GPS assisted navigation. He is the Chair of the Department of Cyber Intelligence and Security at the nation's first College of Security and Intelligence. He has published and presented more than 30 papers in diverse areas ranging from galactic dynamics to cyber threat intelligence information sharing. He is active in building the cyber security workforce in Arizona and is a Member of CyberAwareAZ and the Arizona Cyber Threat Response Alliance (ACTRA)

jon.haass@erau.edu

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