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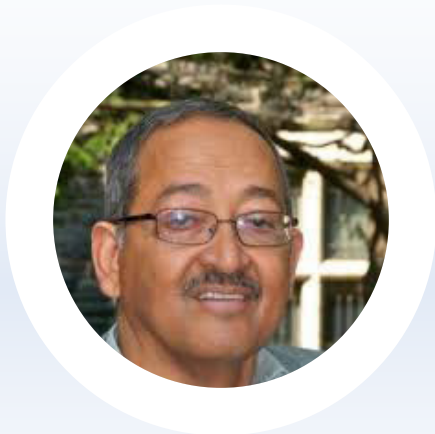
Artificial immune system based approach to cyber-attack detection

Cyber attacks have been increasing at an alarming rate. For example, the attack on Dyn company on October, 2016 have resulted in the cutoff of internet services in the North East of the USA. The Dyn company is an organization that controls many of the domain name servers that give service American domains. This widely successful attack utilized the infamous Mirai – a nasty piece of malware that powers an extensive botnet largely populated by internet of things (IoT) devices. Advancements in internet of things (IoT), wireless, advanced robotics, intelligent agents, cloud computing and other technologies, as well as reliance on 3rd party commercial off-the-shelf software will also increase the cyber-attack surface in systems and networks. Like the ability of the human immune system to detect all infections and how the human body can be related to the complex network of interconnected systems that exist today, our proposal takes a biological approach to solving the network intrusion detection problem. Our proposed bio-inspired system for network intrusion detection makes use of the models that exist in immunology which has been abstracted to an area under artificial intelligence known as artificial immune system (AIS). The proposed system will be a combination of the immunology-developed theory of self-nonsel (SNS) and danger theory (DT). The proposed system stems from our successful application of SNS and DT respectively to the detection of cyber attacks that originate from external networks. Our proposed system will be detecting cyber-attacks that originate from both inside and outside of a communication network.

Biography

Tarek Saadawi is a Professor and Director of the Center of Information Networking and Telecommunications, City University of New York, City College (CUNY/CCNY). He received his BSc and MSc degrees from Cairo University Egypt in 1973 and 1975 respectively and the PhD from the University of Maryland, College Park in 1980. He is Co-Editor of the book "Cyber Infrastructure Protection," Strategic Study Institute, volume 1, May 2011, and Volume 2, August 2013, and Co-Author of the book, "Fundamentals of Telecommunication Network". His current research interests are intrusion detection systems and cyber security.

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