Cognitive and Context Aware Security

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Abstract: In the mid to late 80's researchers identified that most of the system failures are caused by user errors. That led to the development of user centered designs (UCD) to enhance usability of interfaces which in turn mitigates user induced errors. In our research we conjecture that usability will also affect the user acumen in dealing with sensitive/critical data and information. We observe that dynamic working conditions along with the user's physical and emotional state have significant impact upon the usability and security of the system. In order to address this problem, we developed a Cognitive and Context-Aware Framework (CCF) that determines user's affective state, cognitive load, and context information. This enables applications to make real-time decisions to improve usability, security, or simply enhance user experience. The CCF framework constantly captures and analyzes user's biometric data (e.g. pupilometric indices of cognitive load), environmental analysis, location and time. The CCF can be used to develop a variety of applications that want to make decisions based upon user's current affective states and context. In this talk, we present the overview of the framework along with a dynamically adaptable user interface as an example of CCF application. We will also discuss other potential applications of CCF.

Biography:

Dr. Suku Nair is the director of the AT&T Center for Virtualization at SMU, Dallas. He is also a University Distinguished Professor in the Computer Science and Engineering department at the Lyle School of Engineering where he was the Chair from 2008 to 2016. His research interests include Software Defined Networks, Virtualization Technologies, and Cyber Security. He has published extensively in the area of high assurance computing and networking. His research has been supported through funds from National Science Foundation (NSF), National Security Agency (NSA)/Department of Homeland Security (DHS), National Institute for Standards and Technology (NIST), Office of Naval Research (ONR), Space and Naval Warfare Systems Command (SPAWAR), and various industry companies including Lockheed Martin, Alcatel, Raytheon, IBM, AT&T, and Google. He has been a consultant to various IT, Telecom, Retail, and Cyber Security Companies. Some of his recent awards include the Dallas 500 award and CIO/CTO award for Outstanding Tech Advocate from the D CEO magazine, SMU Ford Research Fellowship, IBM faculty award, and the University Distinguished Professorship.

He received his M.S. and Ph.D. in Electrical and Computer Engineering from the University of Illinois at Urbana in 1988 and 1990, respectively.