Announcing the Final Examination of Shawn Gallaher for the degree of Doctor of Philosophy

Time & Location: June 8, 2012 at 3:00 PM in Engineering II 312
Title: An Approach for Measuring the Confidentiality of Information Security Systems in Healthcare Organizations

Because of the expansion in health information technology and the continued migration toward digital patient records as a foundation for the delivery of healthcare services, modern healthcare organizations face significant challenges in their efforts to determine how well they are maintaining the confidentiality of electronic information. The increased propagation of personal medical information predicated by these trends necessitates a need for robust information security measurement approaches. Although several classes and types of methodologies exist for measuring information security in general, a number of overarching issues have been identified which prevent their adaptation to the problem of measuring confidentiality in complex organizational systems.

In this study, a new approach for measuring the confidentiality of electronic information in healthcare-related organizations that leverages systemic principles and concepts is developed. The approach consists of synthesizing an information security system (ISS), defined as a complex system composed of information security safeguards and the people, processes, and technologies which contribute to their realization from the conceptual protection space present within healthcare organizations and measuring confidentiality as an emergent property of this system.

An information security model (ISM) that leverages the structure and parametric modeling capabilities of the Systems Modeling Language (SysML) was developed for specifying an ISS in addition to the contained systemic interactions which are present. Through the use of a parametric solver capability, the complex system of equations which quantify the contained interactions was executed for the purpose of generating a measure of confidentiality using a set of user-provided input values - a process referred to as ISM instantiation.

Major: Industrial Engineering

Educational Career:
Bachelor's of Industrial and Systems Engineering, 2000, Ohio University
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Approved for distribution by Ahmad Elshennawy, Committee Chair, on May 21, 2012.

The public is welcome to attend.