

Dissertation Title: Social Engineers - An Extensible Game-Based Learning Approach to Social Engineering Education and Awareness

Abstract

The past decade has seen a meteoric increase in the number of high-profile cyberattacks and data breaches, many of them utilizing social engineering. While the implementation or theory of security controls and mechanisms at the application, operating system, network, and physical layers continues to be the dominant focal point of recent research within the field of computer and information security, there has been a growing awareness as late of the importance of securing the user layer as well especially from a sociotechnical perspective.

Accordingly, this dissertation aims to assess the general level of knowledge regarding social engineering amongst the student body at Iowa State University, while designing, implementing and evaluating an extensible teaching tool for social engineering education and awareness. To that end, we explore a number of foundational topics, including the typical stages of a social engineering attack with accompanying examples, the use of game-based learning, as well as existing frameworks and models for the development of serious games. This is followed by an extensive literature review of public awareness regarding cybersecurity, and a survey of existing educational games for cybersecurity and academic studies in the area. This is followed by an examination of the original extensible serious game we developed, along with a quantitative evaluation plan to assess social engineering awareness and the efficacy of our serious game. The survey findings are then presented, concluding with a discussion of the results, a summary of our original contributions, the limitations of this work and suggestions for future work and possible further avenues of research.