Introduction to the National Security Agency's Annual Paper Competition
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Abstract

The National Security Agency (NSA) within the United States Government has sponsored an Annual Best Scientific Cybersecurity Paper Competition through its Science of Security and Privacy (SoS) Initiative. This poster will provide an overview the competition, attributes of good scientific papers, special attention will be given to the most recent winning paper as it an outstanding example of usable security research. The paper competition has additional significance this year to the SOUPS community as NSA is sponsoring the SOUPS Best Paper Award and accepting that paper into consideration for the next competition.

Author Keywords

National Security Agency; Annual Best Scientific Cybersecurity Paper Competition; Science of Security and Privacy; Usable Security

ACM Classification Keywords

• **General and reference~Surveys and overviews**
• *Social and professional topics~History of computing*
• Social and professional topics~Computing education programs   • Security and privacy~Usability in security and privacy

Figure 1. The Winning authors of the 5th Annual Paper Competition at NSA with the NSA Research Director.

Introduction

The National Security Agency's Annual Best Scientific Cybersecurity Paper Competition is intended to be the premier award for recent scientific foundational cybersecurity research. It has a goal of promoting rigorous research methods by identifying and highlighting excellence.

Winning and honorable mention papers have been published on a variety of topics and venues. Several papers have been in the usable security field including the winner of the past competition which is highlighted in this poster.

The proposal topic of the poster includes an overview of the NSA paper competition, a highlight of the last winning paper which was in the usable security field, and attributes that the competition looks for in outstanding scientific papers.

History of the Competition

During the 2000s, the US Government and academics recognized a need for a more scientific and disciplined approach to cybersecurity [3]. In 2012, NSA established a Science of Security Initiative charged with increasing the scientific foundations of cybersecurity. One of the first actions was the establishment of an annual competition that would identify and recognize a paper published in the previous year [4]. The competition is preparing to announce the selected paper for the sixth annual competition which was for papers published in 2017.

The competition is structured to take public nominations of any peer-reviewed paper published in the previous year. Originally it was previous government fiscal year but has been moved to calendar year for simplicity. The competition is open to all and is not geographic restricted.

Papers are reviewed by an international committee of distinguished experts who are a diverse set of cybersecurity professionals from government, academia and industry. Each expert independently provides their paper rankings for the NSA Research Director for a final decision.

A winning paper and any honorable mentions are announced publically and invited to NSA (see Figure 1) to present their recognized work and to engage with NSA researchers.

What is Science?

The paper competition has been part of the recent discussions on what is a Science of Security [2][5]. While the distinguished experts and the security research community have yet to agree on a single definition of science, there are attributes of a high quality scientific paper. These attributes include:

- Author discovers something about the cyber world using scientific methods.
- Author indicates how the results do or might extend beyond current case
- Author uses and documents a sound methodology in the research
- Author expresses assumptions and limitations
- Result has foundational or systemic impact
- Paper is of clear of writing and presentation

Last Winning Paper

The 5th annual competition recognized a single winning paper, "You Get Where You're Looking For: The Impact of Information Sources on Code Security," by Yasemin Acar along with five additional authors [1]. This paper is an outstanding example of security research that captures the human behavior component especially in connection.

The authors investigated the impact of reference materials on the quality of code written by android app developers. Quality was evaluated in both how functional it was and how secure. These two attributes were at odds. The reference material that helped make the most functional code was the least secure and the most secure was the least functional.

Not only does the paper draw attention to the importance of having high quality reference materials with secure examples, it serves as example of researchers doing outstanding science showing the attributes listed previously.

Conclusion

The NSA's annual paper competition strives to encourage rigorous foundational cybersecurity and privacy research. The poster introduces the competition, attributes of science and highlights an outstanding example of science and usable security.

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