



NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

September 24 – 26, 2018 | University of Maryland, College Park, MD

NSF Program (either CC or CICI):

Program Area: CICI

Award Number: OAC-1839909

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Project Title: CICI: SSC: SciTrust: Enhancing Security for Modern
Software Programming Cyberinfrastructure



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Quad Chart for: CICI: SSC: SciTrust: Enhancing Security for Modern Software Programming Cyberinfrastructure

Challenge:

- Modern software programming CI, consisting of online discussion platforms (e.g., Stack Overflow) and social coding repositories (e.g., Github), has offered an open-source and collaborative environment for distributed scientific communities to expedite the process of software development.
- Despite the apparent benefits of this new social coding paradigm, its potential security-related risks have been largely overlooked - insecure or malicious codes can be easily embedded and distributed, which severely damage the scientific credibility of CI.

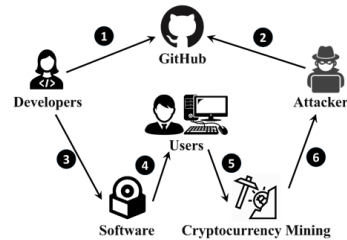
Solution:

Develop innovative techniques to detect insecure or malicious codes on social coding platforms:

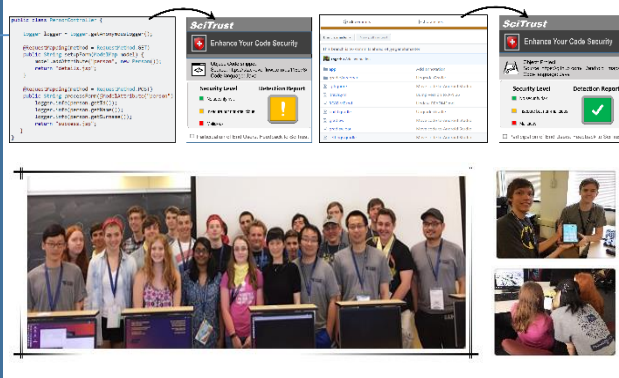
- Automatic detection of insecure code snippets on Stack Overflow.
- Automatic detection of malicious codes on GitHub.
- Development of user-friendly tools for scientific and engineering communities to enhance code security in modern software programming CI.

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Can one trust the codes in social coding platforms?



Our goal is to advance capabilities of AI to enhance the security of modern software programming CI.



Broader Impact:

- Benefit the society at large by promoting the efficiency of cyber-enabled software development without sacrificing the security.
- Robust outreach efforts to K-12, general public, undergraduate, graduate, minority, and women in cybersecurity.
- The establishment of a cybersecurity lab through this project will enhance the cybersecurity training that will help build the national workforce in cybersecurity.

Metadata tag:

- **Yanfang Ye, Shifu Hou***, Lingwei Chen*, **Xin Li**, Liang Zhao, Shouhuai Xu, Jiabin Wang, Qi Xiong. "ICSD: An Automatic System for Insecure Code Snippet Detection in Stack Overflow over Heterogeneous Information Network", ACSAC, 2018. (20.1% acceptance rate).
- Lingwei Chen*, Shifu Hou*, **Yanfang Ye, Brian Woerner**, Jiabin Wang, Qi Xiong, Fudong Shao. "iTrustSO: Utilizing Social Coding Properties for Automatic Detection of Insecure Code Snippets in Stack Overflow", AAI, 2019. (under review).