



# Security by Design: Building Cyber Resilience for Modern Software Development Life Cycle

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## Bio



Dr. Nitin Sukhija is a Professor in the Department of Computing and Security and Director of the Center for Cybersecurity and Advanced Computing (C2AC), a National Security Agency-designated Center of Academic Excellence in Cyber Defense (CAE-CD), at Slippery Rock University of Pennsylvania. He earned his Ph.D. in Computer Science from Mississippi State University (2015), specializing in high performance computing, and holds an MBA from San Diego State University and an MS in Computer Science from National University. His expertise spans high performance computing, dynamic load balancing, performance modeling, cybersecurity, and big data analytics. With over two decades of professional experience, he has conducted research and curriculum development initiatives funded by NSF, DOE, and DOD. He serves on organizing committees for IEEE and ACM conferences, is a member of the ACM SigHPC Education Chapter, and is a Campus Champion for Slippery Rock University in the NAIRR Pilot User Experience Group.

## Abstract

In scientific software development, design priorities such as cost, speed, convenience, open architecture, backward compatibility, and others often trump security requirements. Moreover, this problem is compounded by an increased dependence on the integration of a myriad of software packages and technologies along with an increased need for long-term sustainable software. Thus, incorporating secure software knowledge and practices into scientific software development is becoming increasingly critical to mitigate and defend against malicious attacks that can cause extreme damage to any piece of software, compromising integrity, authentication, and availability. This talk aims to address this issue by providing a comprehensive overview of the secure software development process, a thorough introduction to threat modeling and security assurance testing for identifying potential threats and vulnerabilities during the design phase to build cyber resilience.