

COMBATING CYBERCRIME FROM BOTH SIDES OF THE FENCE

“To be really good at cyber defence, you need to think like a hacker.” This is the advice of Angel Shoji, a software developer at the CSIR, who specialises in cybercrime and coming up with cyber defence solutions.



An unsecured printer hard drive being scanned for sensitive information.

SHOZI'S WORK ENTAILS coming up with secure applications that are totally without vulnerabilities. She explains, “You have to be skilled at intrusion prevention and detection techniques. You need an understanding of computer forensics and you must be able to put yourself in the shoes of a cybercriminal and always remember that someone out there will try to undo, break or reverse engineer the system you built to get to important, confidential information.”

Shoji is proud to say that she loves her job. “Whenever I have to describe how I feel about my work, I use the famous Confucius quote: ‘If you love what you do, you will never work a day in your life.’ I have enjoyed the world of information technology (IT) from a very young age, back when floppy discs were the latest and greatest piece of technology you could own,” she explains. These days the work she does is the stuff great spy novels are made of.

The world is shifting and becoming anchored in IT. Systems are moving from being paper based to being electronic. Businesses are competing with each other, always wanting to know what their competitors are up to. With the growth of IT, they are leveraging its power to spy and access information unlawfully.

Shoji explains, “Fairly recently, there have been international examples of such spying devices being used. A spy phone is a normal mobile phone that has malicious code injected into it to turn it into a device that can spy. It does this by taking pictures and videos, recording conversations, intercepting text and emails – and all without the subject’s knowledge.”

Software developers and cyber security experts at the CSIR have the capability to provide their various clients with defensive strategies to prevent them becoming victims of such cyber incidents.

“Hypothetically speaking, if one of our clients had to ask for this, I would be involved in researching

the security vulnerabilities of mobile phones and coming up with defensive strategies and developing robust software solutions to defend and protect their privacy and information so that they do not become victims of cybercrime,” Shoji explains. “When we develop such solutions, we ensure that the information on our databases is protected and the security we put in place cannot be tampered with.”

Through a process called penetration testing, organisations’ network vulnerabilities are tested. If Shoji manages to compromise the security system, she will discuss the problems with the client and suggest ways to improve their security.

“Humans are the weakest link in any system. This is mainly due to negligence, ignorance and the ease with which he or she can be exploited. These weaknesses expose individuals and their organisations to cyber attacks. It does not matter how good your security measures are, if the user is negligent and decides to write the password on a piece of paper and stick it on the computer screen, it will compromise the entire system.”

Shoji makes it clear that the cyber defence environment requires grit and perseverance to work through the challenges. “IT is not a static environment and you have to be one step ahead at all times. Developing complex cyber defence solutions is challenging, but this is just one aspect of my job. As a software developer in this environment, we are also responsible for creating the graphical user interface of these systems. We have to ensure that we find a balance by making a difficult solution easy to use, function optimally and look appealing in order to keep the user engaged,” she explains.

“This is the best part of my work, I get to be creative and stimulated – plus I know that my work impacts directly on the security of an organisation and of South Africa.”

– Lésa van Rooyen

SOFTWARE DEVELOPER

CHARACTERISTICS

You must have the drive to learn new things, a lot of patience to see it through and an analytical mind to work through the processes. Problem solving forms a big part of your daily work and you must enjoy figuring out coding languages that you have never used before.

RELATED CAREERS

Software developer, application and verification tester and website developer.

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— Angel Shozi

Angel Shozi



WHAT ANGEL SHOZI STUDIED

She completed an NDip, BTech and an MTech – all in information technology, at the Nelson Mandela Metropolitan University in Port Elizabeth.



WHERE TO STUDY

Information technology can be studied at many South African universities and colleges.



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