

## IoT Security Training Today and Tomorrow

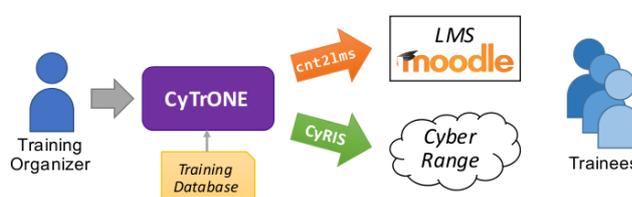
**RAZVAN BEURAN\*, KEN-ICHI CHINEN,  
YASUO TAN, YOICHI SHINODA**

*Graduate School of Advanced Science and Technology, Japan Advanced Institute of  
Science and Technology (JAIST), Nomi, Ishikawa, 923-1292, Japan*

\*e-mail: razvan@jaist.ac.jp

Keywords: IoT security, cybersecurity education and training, cyber range

Cybersecurity education and training are critical in ensuring that current and future IT professionals can face the serious security threats they are and will be confronted with in an ever-increasing manner.



**Figure 1.** Overview of the integrated cybersecurity training framework CyTrONE

At CROND, the Cyber Range Organization and Design NEC-endowed chair created in 2015 at JAIST, we have already done considerable research on how to improve the education and training methodologies in the field of cybersecurity. Thus, the integrated cybersecurity training framework that we are developing, CyTrONE, provides the all necessary mechanisms for conducting hands-on training activities, in particular through the automation of the training environment setup tasks<sup>1</sup>.

In this talk, we shall first give an overview of the various issues regarding IoT security training today. Then, we shall present our approach regarding cybersecurity education and training, including the core component of CyTrONE—the cyber range instantiation system named CyRIS<sup>2</sup>. Finally, we shall discuss our ongoing work on extending the functionality of our framework to the field of IoT security training, such as methodologies for making possible training on large-scale IoT environments, and in more realistic conditions (e.g., via device emulation).

**Acknowledgement** This work was partially supported by JSPS KAKENHI Grant Number 17K00478.

### References

- 1) R. Beuran, C. Pham, D. Tang, K. Chinen, Y. Tan, Y. Shinoda, *CyTrONE: An Integrated Cybersecurity Training Framework*, *International Conference on Information Systems Security and Privacy (ICISSP 2017)*, Porto, Portugal, February 19-21, 2017, pp. 157-166.
- 2) R. Beuran, C. Pham, D. Tang, K. Chinen, Y. Tan, Y. Shinoda, *Cybersecurity Education and Training Support System: CyRIS*, *IEICE Transactions on Information and Systems*, vol. E101-D, no. 03, March 2018, pp. 740-749.