A Secure Authentication Protocol among Mobile Phone and Wireless Sensor Networks

Bruce Ndibanje*, Hoon Jae Lee **

*Department of Ubiquitous IT, Graduate School of Dongseo University, Sasang-Gu, Busan 617-716, Korea

** Division of Computer and Engineering Dongseo University Sasang-Gu, Busan 617-716, Korea
bruce.dongseo.korea@gmail.com, hjlee@dongseo.ac.kr

Abstract—The interaction between mobile phone and wireless sensor networks has increased these days due to the WSN emergence and its ubiquitous nature. Through cellular network, a user can access gateway of wireless sensor networks and gets the data. This paper proposes a secure authentication protocol where a user is strongly verified before accessing the data. The secure authentication proposed protocol provides many security principles to the users for instance user, mutual authentication, and secure session key establishment. Furthermore, security analysis shows that the proposed protocol possesses many advantages against popular attacks, and achieves better efficiency at low computation cost.

Keyword—Authentication protocol, WSN, Mobile network, Gateway node

Bruce Ndibanje was born in Burundi on December 7, 1978. He received the B.Sc degree in Computer Sciences, from Ngozi University, Burundi in 2006. After working as a Network Administrator in General Inspection of Burundi State (from 2007), BSS Engineer in Huawei Technologies Company (from 2008), as Radio & Transmission Engineer (from 2009), at Econet Wireless Burundi, as IT Assistant in United Nations (from 2010) in Integrated Office of UN in Burundi, he has been a Master Researcher member of the Cryptography and Network Security Lab at Dongseo University, Busan, Korea since 2011. His research interest includes Wireless and Sensor Networks, Security in Cellular Networks and Side-channel attack

Hoon Jae Lee received BS, MS, and PhD Degrees in electronic engineering from Kyungpook National University, Daegu, Korea in 1985, 1987, and 1998, respectively. He is currently a full professor in the School of Computer and Information Engineering at Dongseo University. From 1987 to 1998, he was a research associate at the Agency for Defense Development (ADD). His current research interests include developing secure communication system, side-channel attack and USN/RFID security