

# An Evidential Fusion Network based Context Reasoning for Smart Media Service

Hyojin Park, Jinhong Yang, Sanghong An, Jun Kyun Choi

Department of Information & Communications Engineering, KAIST, Korea  
gaiaphj@kaist.ac.kr, sunupnet@kaist.ac.kr, ancom21c@kaist.ac.kr, jkchoi@ee.kaist.ac.kr

**Abstract**— For effective smart media service, a reliable and confidential context recognition is required to prepare and react properly. However, it is difficult to achieve a higher confidence level for several reasons. First, raw data from multiple sensors have different degrees of uncertainty. Second, generated contexts can indicate conflicting results, even though they are acquired by simultaneous operations. In this paper, we demonstrate an Evidential Fusion Network (EFN) based context reasoning for smart media service. For this we conduct the context classification and state-space based context modelling. Then, we perform the static evidential fusion process (SEFP) to obtain a higher confidence level of contextual information. It processes sensor data with an evidential form based on the Dezert-smarandache theory (DSmT). The execution with proposed example scenario demonstrates that the DSmT approach based on PCR5 rule performs better than the DST approach based on Dempster's rule.

**Keyword**— Context reasoning, sensor data fusion, smart media service



**Hyo-Jin Park** (S'07) received M.S. in communications engineering from Information and Communications University in 2007 and currently, she is Ph.D. candidate student in the department of information and communications at Korea Advanced Institute of Science and Technology (KAIST). From 2007 to 2012, she had worked as an editor of ITU-T SG13 Q5 and Q24. Her main research interests include IPTV, multimedia streaming issues, smart media services, and future media.



**Jin-Hong Yang** (S'05) received M.S. in computer science from InJe University in 2005 and HERIT Inc. in 2008 and currently he is a Ph.D. candidate student in Korea Advanced Institute of Science and Technology (KAIST). His main research interests include IPTV, next generation network, multimedia streaming issues, and future media.



**Sanghong An** is a Ph.D candidate in electrical engineering (Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea). He received his Bachelor's degree in computer science from KAIST. He received his Master of engineering degree in electrical engineering from KAIST in 2010. His research interests include web engineering, web of objects, and services in the Internet of Things.



**Jun Kyun Choi** (M'88–SM'00) received the B.Sc. (Eng.) from Seoul National University in electronics engineering, Seoul, Korea in 1982, and M.Sc (Eng.) and Ph.D degree in 1985 and 1988, respectively, in electronics engineering from Korea Advanced Institute of Science and Technology (KAIST).

From June 1986 until December 1997, he was with the Electronics and Telecommunication Research Institute (ETRI). In January 1998, he joined the Information and Communications University (ICU), Daejeon, Korea as Professor. At year 2009, he moves to Korea Advanced Institute of Science and Technology (KAIST) as Professor. He is a Senior Member of IEEE, the executive member of The Institute of Electronics Engineers of Korea (IEEK), Editor Board of Member of Korea Information Processing Society (KIPS), Life member of Korea Institute of Communication Science (KICS)..