Automatic WBAN Area Recognition using P2P Signal Strength in Office Environment

Joonyoung Jung *, Dongoh Kang*, Changseok Bae*

* *Human Computing Research Section*

Electronics and Telecommunications Research Institute, Deajeon, Korea

jyjung21@etri.re.kr, dongoh@etri.re.kr, csbae@etri.re.kr

***(Pt9)Abstract*—The distance estimation between mobile devices is a fundamental issue for a lot of applications of indoor wireless body area network (WBAN). The RSSI have been used to estimate the distance based on the received signal strength from another mobile device. Theoretically, the signal strength is inversely proportional to squared distance, and there is a known radio propagation model that is used to convert the signal strength into distance. However, in real environments, it is hard to measure distance using RSSI because of noises, obstacles, and the type of antenna. Distance estimation using RSSI in real-world applications is still questionable because of inaccuracy. However, RSSI could become the most used technology of distance estimation from the cost/precision viewpoint because of low cost. Mobile devices need to recognize each other in office environment automatically. However, distance estimation using the RSSI of Bluetooth is difficult because of large deviation of RSSI value. This paper provides the experimental results of RSSI measurement between mobile devices in office environment. And it applies the Low Pass Filter (LPF) to reduce the deviation of RSSI value. This paper shows that the distance estimation to recognize WBAN area is possible clearly when Bluetooth RSSI LPF data are used.**

***(Pt9)Keyword*— Bluetooth, RSSI, Distance estimation, WBAN, Office environment**

Joonyoung Jung received the B.S. and M.S. degrees in Computer Network Engineering from Soongsil University, Republic of Korea, in 1996 and 2000, respectively. Since 2000, he has been a researcher at Electronics and Telecommunications Research Institute. He currently develops the virtualization system and cloud computing technology. His research interests in cloud computing, virtualization system, and home multimedia network service.

Dongoh Kang received his B.S. degree in electronic engineering from Yonsei University, Korea, in 1994. And, he received his M.S. and Ph.D. degrees in electronic engineering from Korea Advanced Institute of Science and Technology, Korea, in 1996 and 2001 respectively. Since 2001, he has been working at Electronics and Telecommunications Research Institute. His research interests include home network middleware, distributed control, and server cluster power management.

Changseok Bae received his B.S. and M.S. degrees in electronic engineering from Kyungpook National University, Korea, in 1987 and 1989 respectively. He also received his Ph.D. degree in electrical and electronic engineering from Yonsei University, Korea, in 2003. From 1989 to 1996, he was a senior researcher at Systems Engineering Research Institute, where he worked on image processing and pattern recognition. From 1997 to 1999, he worked with Korea Ministry of Information and Communication, where he participated in establishing national software research and development policy. Since 2000, he has been a principal research staff of Post-PC Platform Research Team and Personal Computing Research Team at Electronics and Telecommunications Research Institute (ETRI). From 2004-2005, he was a Research Fellow at School of Information Technologies, University of Sydney, Australia. His research interests include image processing, multimedia codec, home server architecture, information hiding and data mining, cloud computing, social network, virtualization system