

Touch Based Multi-band Service using Human Body Communications

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Touch based multi-band service, in which human body communications (HBC) for network setup and wireless local area network (WLAN) for data transmission are combined, has been proposed. HBC using a human body as transmission channel has emerged as a solution for body area network (BAN) in which the body sensors, wearable devices, and mobile devices are connected each other. HBC devices have some advantages which are low power consumption and relatively longer transmission distance than near field communications like NFC or RFID in which communication is established by contacting each other together or bringing them into close proximity, usually no more than a few centimeters. In additions, HBC can easily create wireless network between devices by touching them, hence no additional procedure for user to set up network is needed. So, it can provide convenient and intuitive service by touching the devices which are wanted to be connected. Also, WLAN is one of the most widely used technologies in mobile device such as notebook, tablet PC, smart phone, mp3 player etc. Despite of low power consumption and high data rate up to a few tens of Mbps, transmission rate of HBC is inherently limited due to the low pass filter characteristics of human body channel. Restricted transmission rate of HBC forces users to keep in touch with both devices more time by the end of transmission. HBC technology is not enough to transmit recent big multimedia data such as high definition video and high quality mp3 file.

To overcome these disadvantages, touch based multi-band service using both HBC and WLAN is proposed. This communication system is combined HBC for setting up network and WLAN for data transmission, so it can provide intuitive and convenient networking service and high-speed data transmission rate. This system can create a network for data transmission between devices within 1s using HBC, and big multimedia data can be transmitted approximately 50Mbps using WLAN. HBC module using transparent-type electrode was developed to apply for mobile interface and convenient contact. To improve reliability of data transmission, analog front-end with an improved sensitivity which has the best sensitivity of 165uVpp was developed and a transparent conductive electrode was applied for mobile devices such as PDA, Smart phone and Tablet PC.

Finally, we had demonstrated the real time video streaming service between notebook and tablet PC using proposed communication systems. In the future, we will study for improving reliability of data transmission and networking using HBC.