BAN based on UWB
Toward Assisting Visually-Impaired People and Applications to Healthcare

Body Area Network

A Body Area Network (BAN) is a wireless network that comprises small devices placed on surface of, inside of, or in the vicinity of a human body and connected by radio. It can be used to wirelessly transfer audio, images, and other types of data between small devices to provide safe, secure, and convenient daily life. NICT is promoting research and development, as well as standardization of BAN.

The Developed Prototype BAN

The UWB band that is commonly available in the U.S., EU, and Japan is 7.25 - 8.5 GHz. NICT developed a prototype system for assisting visually-impaired people, that operates at the UWB common high band. The prototype BAN comprises a belt-attached unit (H), a cane-attached unit (S1), a camera unit (S2), and a wrist-watch type unit (S3).

Assistance To Visually-Impaired People

The prototype BAN collects color signals using (S2) attached to a sunglasses; carotid pulse, SpO2 (blood oxygen saturation level), body temperature from (S3); and obstacle detection information from (S1). All above information is transmitted to the hub (H) using UWB, and the hub (H) tells a user what color it recognizes and gives an audio warning if an obstacle is in the way. In addition, the hub displays the distance to an obstacle, carotid pulse, SpO2, and body temperature on a monitor. With this prototype BAN, we successfully demonstrated the operation of a BAN based on the high band of UWB.

Healthcare Applications

- The sensor of remote medical sensing
- Health check for the elderly in home
- Vital data checkup at daily load
- Patient’s centralized care in hospital /care center

- Moisture
- Acceleration
- Temperature

Diaper

Sensor

Care center