Advantages of VLC for monitoring body parameters in the healthcare sector

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Abstract

Wireless data connectivity is very important in the healthcare sector and becomes even more important due to patient mobility reasons. Data communication with electromagnetic waves, as used in most WiFi systems, is not applicable in specific healthcare areas where radio frequency (RF) radiation is forbidden or have a critical impact on the data integrity. Visible light communication (VLC) is a technology using visible light for alternative wireless communication with various advantages such as ubiquity, low energy consumption, no radio frequency (RF) radiation, and security against undesired network access (An and Chung, 2016). It is a source of illumination and provides wireless connectivity at the same time. Continuous monitoring of body parameters can have advantages in hospitals for patients and doctors in the same way. Data security as a fact is very important in medical networks including personal patient data. VLC can provide this security by limiting the communication around the patient. Visible light is not able to permeate through walls and so the personal information is limited to structural conditions. There are even no restrictions using VLC in hospital areas with RF sensitive machinery like operating rooms or MRIs (Wagh and Patil, 2019). In this article, we focus on concepts and feasibility of this technology to evaluate specific advantages in body area networks, IoT and additional applications in monitoring bady parameters in the hospital area. The results are presented in the context of classic wireless communication systems to demonstrate the benefit for patients and their individual needs.

Biography

Hubert Wimmer MSc. is an academic teacher and researcher at the FH Campus Wien in the Engineering Department since more than 4 years. His work is located in the fields of energy and communication network technologies as well as innovation management. He is working on future technologies for efficient and sustainable energy management concepts including communication network solutions. The VLC research project is part of the OP Innovation Center Vienna to evaluate possible applications under real conditions in the environment of a hospital area, especially operating theatres and ICUs.
(https://www.fh-campuswien.ac.at/departments/technik/operationssaal-innovation-center.html)

References

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