

T10. Visible Light Communication: Concept, Technology, Challenges and Possibilities

Abstract:

It is believed that high speed data transmission will play an important role in our daily life. Multimedia information is envisaged to be available at any place and at any time, and wireless access networks constitute a key element for achieving these goals. Moreover, wireless communication systems now deploy several access technologies. However, radio frequency (RF) bandwidth at frequency ranges which allow reasonable spatial coverage is a limiting factor. Therefore, alternative wireless transmission means as supplementary technology have to be explored. Optical wireless communication system especially Visible Light Communication (VLC) using Light Emitting Diodes (LEDs) offers the potential for such supplementary system. The ultimate goal is to provide ubiquitous connectivity, integrating seamlessly operations in most common scenarios, ranging from fixed and low-mobility indoor environments in one extreme to high-mobility cellular systems in the other extreme. With a number of benefits such as license free, high bandwidth and low cost system; the VLC technology offers multiple potential applications. This tutorial will highlight the technology, concept, overall systems, challenges and the possibilities. A case study of outdoor safety application will also be presented.

Speaker's Biography:

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Navin Kumar received his B Tech. degree in Electronics and Telecommunication Engineering from IETE, New Delhi – India in 1995. He worked as graduate engineer with Govt. defence organization. He did his Master in Engineering in Digital System engineering from Motilal National Institute of Technology, Allahabad –India in 1999. He continued his work as design engineer with defence organization until 2001. He worked as a lecturer in Uttar Pradesh Technical University (India) and expatriate faculty (2003-2007) with Ministry of education Ethiopia. He completed his PhD in Telecommunication jointly conducted by university of Aveiro, Minho and Porto Portugal, Europe in 2011. Kumar worked as research associate with Institute of Telecommunication, Aviero, Portugal until 2011. Presently, he is a professor at The Oxford college of Engineering, Bangalore –India. His main research interests are in Visible light communication system, intelligent transportation systems. Kumar has authored a book and published more than 20 papers in international conferences, journal and book chapters. He is a member of IEEE, IAENG(HK), Fellow of IETE, and IE(India).