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# The State of Art, Challenges and Opportunities for the Deeply Integrated Visible Light Communications System

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## **Abstract:**

Visible light communication (VLC) is using light emitting diode (LED) to support both information transmission and localization, which has become an appealing alternative to the radio frequency communication technology, especially for the indoor wireless broadband broadcasting applications. It is even considered as a very important solution for not-upcoming 6G yet, which needs the support from the backbone network. Power line communication (PLC) systems utilize the ubiquitous power line network to provide electricity to the LED lamps while it also serves as the backbone network for the VLC systems naturally. A novel and cost-effective indoor broadband broadcasting system, integrating both VLC and PLC systems with much less modification to the current infrastructure and better signal coverage is therefore proposed. Also in the 5G era, RF signal can also serve as the backbone of VLC. This talk will cover the recent research progress and the prototyping development in this area. The future trends for this work will also be addressed.



### **Biography:**

Dr. Jian Song received his B. Eng. and PhD from Electronic Engineering Department, Tsinghua University, China in 1990 and 1995, respectively with 1<sup>st</sup> Class Honor. He is now a full professor of the same department in Tsinghua University, as well as the Director of digital television (DTV) Technology R&D Center, one of the major technical contributors for the Chinese digital terrestrial television broadcasting standard. He is very active in serving the communities, such as being Associate Editor (AE) of IEEE Transactions on Broadcasting, the leading AE of IEEE Access for Broadcast Technology Society (BTS), and General Chairs and TPC Chairs for several IEEE flagship conferences.

Professor Song also has great involvement with international telecommunications union (ITU) and is WP 6A Vice-Chairman. He also serves as the Editor-in-Chief (EiC) of ITU Journal of information and communications technologies (ICT) Discoveries, EiC of ITU-Tsinghua joint Journal of Intelligent and Converged Networks.

Dr. Song's current research interest is in the digital broadcasting, network convergence, and the integrated system of visible light and powerline communications. He has published over 280 peer-reviewed papers, and co-authored five books and seven book chapters both in English and Chinese in the aforementioned areas. Dr. Song is the Fellow of IEEE, IET, CIE, and CIC.