

ICT 2019 Special Session Proposal on Visible Light Communications

8-10 April, Hanoi, Vietnam, <http://ict-19.org/>

Visible Light Communications: State-of-the-Art, Challenges and Opportunities

Visible light communications (VLC) is an emerging access network technology that has become an ever-increasing topic of interest over the last decade. VLC often makes use of solid-state lighting-emitting diode (LED) infrastructure to provide simultaneous room illumination and data communication functionality. Data is communicated via intensity modulation and direct detection of visible wavelengths and offers 3-400 THz of unlicensed, unregulated bandwidth, making it an extremely attractive solution to the upcoming capacity crunch and for 5G access technologies.

Several key research challenges have emerged within the VLC domain, including multi-technology network tenancy, high data rates, physical layer security, resource allocation, co-design of high-speed data rates and dimming capabilities, machine-to-machine and novel material photoactive components. The VLC technology is of interest to the ICT community due to its flexibility of deployment and capability to provide low-cost infrastructure that will enable new network services and high-speed connectivity. It is envisaged that VLC will not replace RF technologies, but complement them, adding functionality such as high bandwidth, low latency connectivity for media/gaming applications in homes, or individual attocell connectivity in offices.

This workshop will cover the hot topics of the VLC technology from a general approach that will be accessible to the wider ICT community, and will cover the most important topics in VLC technology including (but not limited to) the following:

- Advanced modulation techniques, equalisation and data recovery
- Co-illumination/dimming and communication system design
- Multiple access techniques, scheduling and interference mitigation
- Resource management and intelligent multi-user system design
- VLC-based backhauling
- Underwater VLC
- Multiple-input multiple-output for VLC
- Camera-based VLC systems and optical camera communications
- Organic polymer-based VLC systems
- Channel modelling/characterisation/signal design
- Hybrid networks (RF/VLC, FSO/VLC, x/VLC)
- Fixed and mobile system design
- VLC-based IoT systems for device-to-device or e-health applications
- Intelligent transport systems
- Localisation and mapping

Invited speakers:

Prof. Zabih Ghassemlooy, Northumbria University, and **Prof. Nan Chi**, Fudan University will deliver extended discussion about the state-of-the-art developments in their laboratories and the future prospects, directions and applications of VLC technology.

Important Dates:

Paper submission: 31/12/2018

Reviews completed: 21/02/2019

Acceptance notification: 28/02/2019

Camera ready submission: 10/03/2019

Session Organising Committee:

Dr Paul Anthony Haigh, University College London, UK

Dr Sujan Rajbhandari, Coventry University, UK

Dr Son Thai Le, Nokia Bell Labs, Stuttgart, Germany

Dr Hoa Le Minh, Northumbria University