IEEE JOURNAL ON
EMERGING AND SELECTED TOPICS IN CIRCUITS AND SYSTEMS

Call for Papers

Circuits and Systems for Green Video Communications

Guest editors

- Christian Herglotz, Brandenburgisch-Technische Universität Cottbus-Senftenberg, Germany
- Olivier Le Meur, Interdigital, France
- Daniel Palomino, Federal University of Pelotas, Brazil
- C.-C. Jay Kuo, University of Southern California, USA

Scope and purpose

The impact of Information and Communication Technology (ICT) on global energy consumption and greenhouse gases (GHG) has become more than significant. Caused by the rapid growth in the total volume of data, the high number of end-user devices, and the growing energy demand of the digital infrastructures, digital technologies now emit 4% of GHG, just more than the civil aviation industry. This rapid increase is mainly due to the usage of online video consumption and it should not decline in the coming years. A key question is how to reduce efficiently the ICT impact on our environment without requiring us to dramatically change our everyday digital practices.

There are already many initiatives in this direction, such as in video communication and particularly video conferencing. This new way of communication allows us to reduce greenhouse gas emissions, especially in the transport and aviation sectors. However, along with this kind of effort, new data-hungry technologies for the processing of visual data arise on the horizon. This encompasses immersive media technology as well as highly complex signal processing methods such as deep neural networks for image and video communication task. Moreover, new data types such as point clouds and immersive media are gaining more and more interest. To allow sustainable use of visual communications in the future, this special issue focuses on novel and effective methods to reduce the power and energy consumption of entire systems or parts of video and visual communication pipelines.

Topics of interest

For the scope of our special issue, we aim to solicit papers from the following five prioritized topics:

1. **Green circuits and systems in conventional video compression**
2. **Green circuits, algorithms, and systems for learning-based video coding techniques**
3. **Green circuits and systems for visual signal capturing, processing, and display**
4. **Holistic energy optimization of online video services**
5. **Energy efficiency of immersive media applications**

More detailed, the proposed topics can investigate the following subjects and beyond

- **Complexity reduction and energy efficiency improvement targeting sustainable video compression**
- **Green training and inference in learning-based video coding techniques**
- **Energy-efficient architectures for video delivery at scale**
- **Efficient storage, transmission, and display of video data**
- **Efficient production and processing of videos**
- **IoT-based low-power video capturing and processing**
- **Joint Quality-of-Experience (QoE) and power consumption optimization**
- **Sufficiency in video communications and quality of acceptance**
- **Energy efficiency of point cloud, 3D graphics, and immersive media applications**
- **Sustainable use of existing infrastructure and hardware for visual signal processing**

Submission procedure

Prospective authors are invited to submit their papers following the instructions provided on the IEEE JETCAS website: https://ieee-cas.org/publication/JETCAS/manuscript-submission-guide. The submitted manuscripts should not have been previously published, nor should they be currently under consideration for publication elsewhere.

The IEEE JETCAS submission site is https://ieee.atyponrex.com/journal/jetcas.

Important dates

- **Manuscript submissions due:** **August 31, 2024**
- **First round of reviews completed:** **October 14, 2024**
- **Revised manuscripts due:** **November 22, 2024**
- **Second round of reviews completed:** **December 20, 2024**
- **Final manuscripts due:** **January 15, 2025**

Request for information

Corresponding Guest Editor: Christian Herglotz (christian.herglotz@b-tu.de)