The Theme: The role of power electronics in electrical grids has been changing in the last decades, moving from load control (motor drives, ballast) to the improvement of load-grid interaction (lower THD and higher PF) and the integration of renewable energy sources like wind, photovoltaics and wave energy into the electrical grids (HVDC, microgrids). Advances in power devices, control circuits and strategies, communication and management systems and the application requirements have driven these changes but further steps must be carried out in these fields to replace high-efficiency and reliable transformers with Smart (Solid State) Transformers in order to reduce the overall weight and volume and provide real-time power management capabilities, thereby making the electrical grid more reliable by improving the power flow in local networks with an increased integration of renewable energy.

This Special Section on “Smart Transformer: Control, Communications and Applications” is focused on control and communication issues related to the application of Smart Transformers in distribution electrical grids, traction systems and more specific applications such as data centers or marine environments. Topics include, but are not limited to the following research topics and technologies:

- Topology/Architecture related issues in Smart Transformers (different topologies, modular design)
- Management and protection capabilities in Smart Grids (routing of energy, thermal control)
- Grid support/management/services (unbalanced power flow, current congestion, voltage fluctuation, overloading, harmonics)
- Grid integration of renewable energy sources (wind, PV, wave) and electrical vehicles with Smart Transformer technologies
- Flexible power management and power flow
- Power quality improvement (disturbance, fault, harmonics, transients)
- Real-time communication in the Smart Transformer and in the application
- Reliability, condition monitoring, lifetime estimation and its improvement by means of control and communication
- Application related issues: traction, data centers, harbors, offshore systems.

All contributions must focus on control and communication issues related to the application of Smart Transformer. Results obtained by simulations must be validated in bounds by experiments or analytical results.

Manuscript Preparation and Submission

Follow the guidelines in “Information for Authors” in the IEEE Transaction on Industrial Informatics [http://tii.ieee-ies.org/](http://tii.ieee-ies.org/)
Please submit your manuscript in electronic form through Manuscript Central web site: [http://mc.manuscriptcentral.com/tii](http://mc.manuscriptcentral.com/tii). On the submitting page #1 in popup menu of manuscript type, select: SS on Smart Transformer: Control, Communication and Applications.

Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Before submitting manuscript check the review criteria ([http://tii.ieee-ies.org/o/RC.pdf](http://tii.ieee-ies.org/o/RC.pdf)) and other information ([http://tii.ieee-ies.org/o/DI.pdf](http://tii.ieee-ies.org/o/DI.pdf)).

**Note:** The recommended papers for the section are subject to final approval by the Editor-in-Chief. Some papers may be published outside the special section, at the EIC discretion.

**Timetable:**

| Deadline for manuscript submissions | April 30, 2015 |
| Expected publication date (tentative) | April 2016 |

**Guest Editors:**

Tamás Kerekes, Dept. of Energy Technology, Aalborg University, Denmark, tel: +45-9940-3308, tak@et.aau.dk

Alberto Pigazo, Dept. of Computer Science and Electronics, University of Cantabria, Spain, tel: +34-942-201576, alberto.pigazo@unican.es

Marco Liserre, Chair of Power Electronics, Christian-Albrechts-Universität zu Kiel, Germany, tel: +49 431 8806100, ml@tf.uni-kiel.de

**Editor-in-Chief:** Kim-Fung Man, [http://tii.ieee-ies.org/eic.tii@ee.cityu.edu.hk](http://tii.ieee-ies.org/eic.tii@ee.cityu.edu.hk) tel: +852-3442-7754 fax: +852-3442-0607

Head of Electronic Engineering Department, City University of Hong Kong, Tat Chee Ave., Kowloon, HK