Industrial Internet of Things (IIoT): Where we are and What’s next?

Theme: When IoT meets Industry 4.0, we talk about Industrial Internet of Things (IIoT) or the use of typical Internet of Things (IoT) solutions in the industrial sector, integrating different technologies such as machine learning, big data and analytics, sensor data, Machine to Machine communication (M2M) and automation. Its application within the fourth industrial revolution has initiated a profound change within companies making them increasingly connected and allowing them to exploit data to optimize their production processes. IIoT is revolutionizing sectors such as manufacturing, automotive and healthcare.

Collecting and analyzing all the data coming from the production sensors and drawing the information for your business through business analytics tools is the new key to competitiveness. Nowadays, IIoT is able to connect each process line, each production phase, each single machine thanks to different types of sensors (RFID, accelerometers, thermometers) positioned in critical points. Thanks to the data generated by the objects and transmitted to the system, it is possible to obtain accurate monitoring of the system, of the system quality, of the energy efficiency and of timely signalling of the set criticalities (vibrations, wear, temperature or system pressure level).

There are some very concrete and immediate benefits that IIoT brings to all types of companies. The first is predictive maintenance; that is, the possibility of having assets that have a state of health always monitored, to anticipate and prevent possible failures. The second tangible advantage, both for end-users and for OEMs, is the remote monitoring of assets, which allows knowing if production is in line with expectations or if the asset is underutilized and therefore has more excellent inherent capabilities. The third benefit is offered by the Digital Twin, the digital representation of an object, its behaviour and integration into the operating environment. The "digital twin" allows you to check whether the real functioning of the assets is in line with expectations or to identify the causes of any anomalies by comparing the real asset with its digital image. Those who must build a system, thanks to the Digital Twin, can foresee its operation before producing it, avoiding running into unexpected behaviour only after having installed it.

A fundamental point is the collection of plant data and their subsequent classification according to the key indicators for the business (or KPI) to get to the interactive display accessible from any device. In essence, we enter the world of IIoT. Industrial Internet of Things, the all the technologies that network (making analyzable) what machines, presses, ovens and components communicate through the application of specific sensors.

We are still at the beginning of the development of the Industrial IoT, which has enormous potential that companies have yet to realize by defining each their path towards the possible new future. The implementation of the IIoT is bringing a real revolution within the industries. It offers, and does more effectively, process productivity, quality control and sustainability.

Topics include, but are not limited to, the following research topics and technologies:

- Fundamental theory and modeling techniques for IIoT
- Networking and Computing Architecture in IIoT
- Artificial Intelligence in IIoT
- IIoT applications in Smart Factory
- Security, Privacy and trust methodologies in IIoT
- Predictive Analysis in IIoT
- Industrial robotics and autonomous systems through IIoT
- Digital Twin in IIoT
- Cyber-physical approach for IIoT systems

Manuscript Preparation and Submission

Follow the guidelines in “Information for Authors” in the IEEE-IES website: http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics. Please submit your manuscript in electronic form through Manuscript Central website: https://mc.manuscriptcentral.com/tii. On the submitting page #1 in popup menu of manuscript type, select: SS on Industrial Internet of Things (IIoT): Where we are and What’s next?

Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Regular manuscript length is 8 pages.

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:**

<table>
<thead>
<tr>
<th>Deadline for manuscript submissions</th>
<th>September 30, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected publication date (tentative)</td>
<td>March 2021</td>
</tr>
</tbody>
</table>

Guest Editors:

- **Dr. Francesco Piccialli**, University of Naples FEDERICO II, Italy Francesco.piccialli@unina.it
- **Prof. Nik Bessis**, Edge Hill University, United Kingdom nik.bessis@edgehill.ac.uk
- **Prof. Erik Cambria**, Nanyang Technological University, Singapore, cambria@ntu.edu.sg

**Editor-in-Chief:** Prof. Dr.-Ing; Ren C. Luo

http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics

---

Submissions to this Special Section must represent original material that has been neither submitted to, nor published in, any other journal. Regular manuscript length is 8 pages.

**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:**

<table>
<thead>
<tr>
<th>Deadline for manuscript submissions</th>
<th>September 30, 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected publication date (tentative)</td>
<td>March 2021</td>
</tr>
</tbody>
</table>

**Guest Editors:**

- **Dr. Francesco Piccialli**, University of Naples FEDERICO II, Italy Francesco.piccialli@unina.it
- **Prof. Nik Bessis**, Edge Hill University, United Kingdom Nik.Bessis@edgehill.ac.uk
- **Prof. Erik Cambria**, Nanyang Technological University, Singapore, cambria@ntu.edu.sg

**Editor-in-Chief:** Prof. Dr.-Ing; Ren C. Luo

http://www.ieee-ies.org/pubs/transactions-on-industrial-informatics