

IEEE an Open Platform for Smart Cities

Dr. Hermann Brand, European Standards Affairs Director, IEEE European Office

ITU Workshop, Brussels, Belgium, 19 February 2018



Agenda

- ▶ Some IEEE Initiatives
 - Smart Cities,
 - Big Data,
 - Ethical Consideration on Autonomous Systems
- ▶ Evolving IEEE legacy standards and new work for Smart Cities
- ▶ Associated cross-sector standardization



IEEE: World's Largest *Professional Society of Engineers* Advancing Technology for Humanity

GLOBAL REACH



420,000⁺
WORLDWIDE MEMBERS

46

TECHNICAL SOCIETIES &
COUNCILS



160⁺ COUNTRIES
INVOLVED

TECHNICAL BREADTH

1,800⁺ ANNUAL
CONFERENCES



4⁺ MILLION
TECHNICAL DOCUMENTS

180⁺
TOP-CITED
PERIODICALS

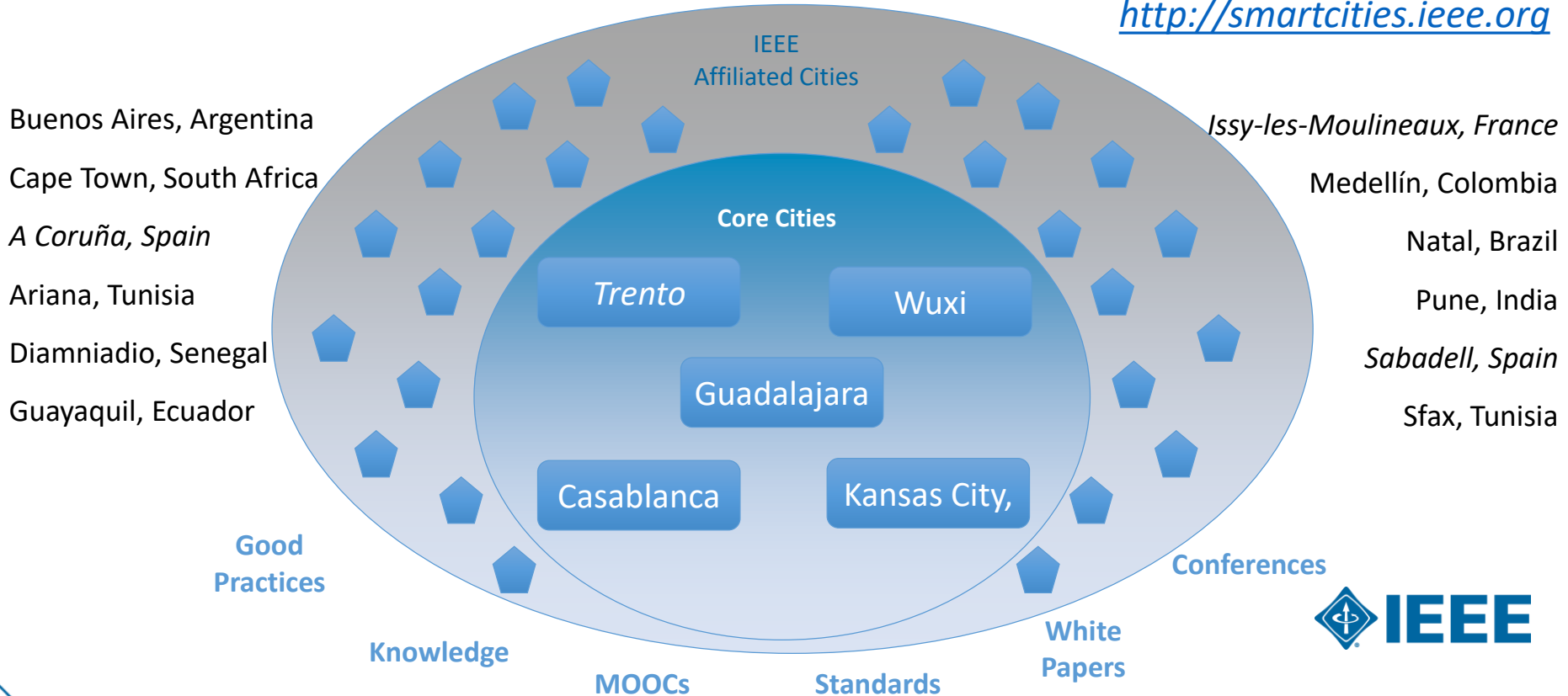


Collaboration is our *Foundation*

The IEEE Smart Cities Initiative Ecosystem

The Smart Cities Initiative Network & Forum

<http://smartcities.ieee.org>



Eligibility of IEEE Smart Cities

- ▶ The city has a Smart City Plan
 - Themes of interest are defined
 - The plan is under way, or can be under project
 - Resources are available or planned
 - The city is willing to share experience
- ▶ The local IEEE Section or Chapter is willing to lead
- ▶ Local universities have programs on Smart City, or may want to develop some
- ▶ A local industry support is highly appreciated



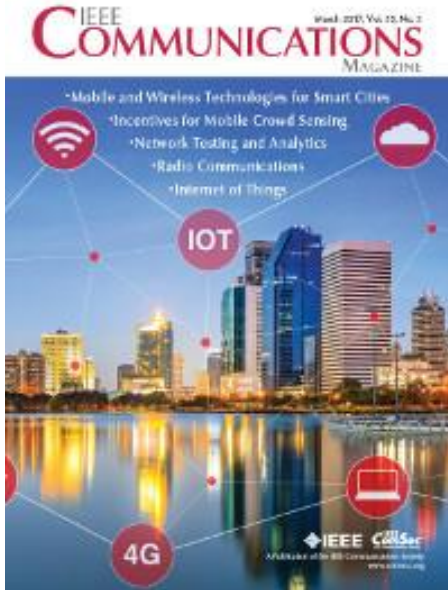
Conferences, for example



The IEEE International Smart Cities Conference (**ISC**) is the **flagship event of the IEEE Smart Cities Initiative**. The Theme for ICS 2018 in Kansas City is: 'A Systems Approach for Smarter Communities'. To learn more, visit <http://sites.ieee.org/isc2-2018/>



Publications, for example



March 2017

Explore **IEEE Xplore**[®]
DIGITAL LIBRARY



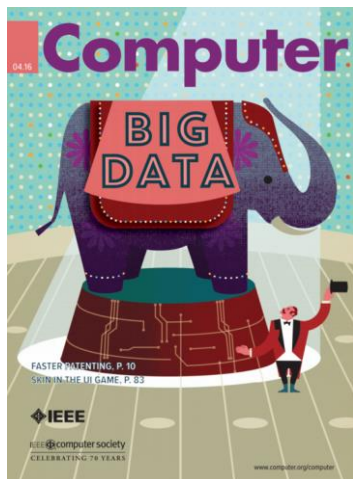
June 2014

- IEEE Smart City **Whitepapers**
- IEEE International Smart Cities **Conference (ISC) Proceedings**
- **News Articles**

<https://smartcities.ieee.org/articles-publications.html>

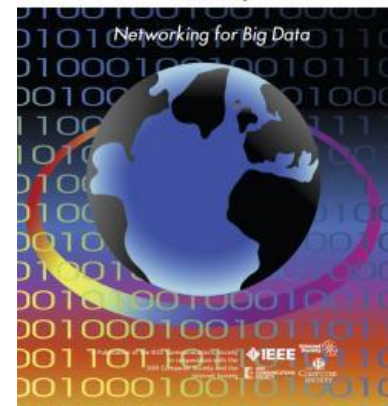


IEEE Big Data Initiative



The IEEE Big Data Initiative serves as **collaboration platform** for a global community of professionals in industry, academia, and government to work together to solve the challenges associated with Big Data, in particular by developing an **interoperable data infrastructure through extensible governance and metadata lifecycle framework.**

<https://bigdata.ieee.org/>



IEEE Workshop on Big Data Governance and Metadata and Management (BDGMM 2018), March 19-20 2018, Berlin



IEEE Ethics Initiative



The goal is to identify and find **broad consensus** on pressing **ethical and social issues** and **candidate recommendations** regarding development and implementations of **Artificial Intelligence and Autonomous Systems**.

<https://ethicsinaction.ieee.org/>



IEEE
Society on
Social
Implications
of Technology



From initiatives to standards setting

Initiatives

Pre-Standardization

Standards Setting



Future Directions



e.g. IC17-006-01

Industry Connections



Standardization Projects

e.g. P2784, P3333.2.x series, P7000 series

Publications, videos, interviews, webinars, articles, whitepapers, position statements, reports, recommendations, guides, etc.

Mission, constitution, business model, governance, membership, process, technical competence, etc.

Maturity level of results

Boundary of an SDO

IC17-006-01: Big Data Governance and Metadata Management
 P2784: Smart City Planning Guide
 P3333.2.x: Standards for 3D Medical Data Management and Visualization
 P700x series: Standards for Data Governance (and more)



IEEE standardized solution elements – a toolbox

IEEE
802™

- ▶ IEEE Standards for a broad range of technical domains,
 - ▶ from information and communication technologies (LAN/MAN) to power and energy,
 - ▶ from radiation to nuclear,
 - ▶ from aerospace to broadcast,
 - ▶ from medical devices to nanotechnologies, etc.
- ▶ Base standards e.g. Time Sensitive Local/Metropolitan Area Networking (TSN) for many verticals (manufacturing, smart cities, ...)
- ▶ Specific standards for vertical industries
- ▶ Both Technical AND Ethical Standards



EMC
SOCIETY®

IEEE
Nanotechnology
Council

IEEE
Computational
Intelligence
Society

IEEE
Robotics &
Automation
Society

IAS
IEEE INDUSTRY
APPLICATIONS
SOCIETY

IEEE
&M
instrumentation
& measurement
society

EMB

IEEE
PES
Power & Energy Society™

IEEE
ComSoc™
IEEE Communications Society

IEEE
computer
society

IEEE

IEEE Standards Help Enable Smart City Technologies for Humanity



New Project – Smart City Planning Guide (P2784)

- ▶ This guide will **provide a framework that outlines technologies and the processes for planning the evolution of a smart city.**
- ▶ This guide provides planning steps that
 - allow for **deployments to be reflective of the needs of constituents** in a given area and
 - enable data to **drive best practices decisions** that use technology as a tool to improve outcomes for people.
- ▶ This framework provides a **methodology for municipalities and technology integrators** to be used as a tool to plan for interoperable, agile, and scalable solutions that are able to be implemented and maintained in a sustainable manner and seamlessly connect from city to city, state to state, and region to region.



Ethics related standardization projects in support of AI/ASs

- P7000 - Model Process for Addressing Ethical Concerns During System Design
- P7001 - Transparency of Autonomous Systems
- **P7002 - Data Privacy Process**
- P7003 - Algorithmic Bias Considerations
- **P7004 - Child and Student Data Governance**
- **P7005 - Transparent Employer Data Governance**
- P7006 - **Personal Data AI Agent**
- P7007 - Ontological Ethically Driven Robotics and Automation Systems
- P7008 - Ethically Driven Nudging for Robotic, Intelligent and Autonomous Systems
- P7009 - Fail-Safe Design of Autonomous and Semi-Autonomous Systems
- P7010 - Wellbeing Metrics Standard for Ethical AI and AS

We partner with a number of players in the field of emerging technologies, where we may bring collective value ...



A word cloud illustrating the phrase "thank you" in various languages and scripts. The central and largest word is "thank you" in red. Other prominent words include "danke" (blue), "teşekkür ederim" (pink), "gracias" (green), "obrigado" (green), "merci" (orange), "sukriya" (purple), "dziękuje" (purple), "bedankt" (yellow), and "dank je" (green). The cloud also features many smaller words in various languages including Japanese (謝謝), Chinese (感谢), Russian (спасибо), Hindi (धन्यवाद), and others. The words are arranged in a circular pattern with varying font sizes and colors.



Thank You So Much



*Advancing Technology
for Humanity*





IEEE

*Advancing Technology
for Humanity*



Medical 3D Data Standards

- ▶ P3333.2.2 - Standard for Three-Dimensional (3D) Medical Visualization
- ▶ P3333.2.3 - Standard for Three-Dimensional (3D) Medical Data Management
- ▶ P3333.2.4 - Standard for Three-Dimensional (3D) Medical Simulation
- ▶ P3333.2.5 - Standard for Bio-CAD File Format for Medical Three-Dimensional (3D) Printing

Dr. Hermann Brand
European Standards Affairs Director
IEEE Technology Centre GmbH
Heinestrasse 38, 1020 Vienna
Austria
+43 1 213004 331
h.brand@ieee.org

