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Stepan Petrus, EBSCO Information Services  
May 7, 2019

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 **IEEE**  
Advancing Technology  
for Humanity

# Thank you for being here today!

## Our agenda

- What's New @ IEEE:
  - IEEE and the 4th Industrial Revolution
  - New content and publications
  - New initiatives in Open Access
- IEEE *Xplore*: Recent Enhancements and Sneak preview into future plans
- Drawing and close



# About the IEEE

- World's largest technical membership association with more than 420,000 members in over 160 countries
- Not for profit organization “Advancing Technology For Humanity”
- Core areas of activity
  - Membership organization
  - Conferences organizer
  - Standards developer
  - Publisher of journals, conferences, standards, eBooks, and eLearning
- IEEE *Xplore* by the numbers:
  - Nearly 5 million total documents
  - More than 12 million downloads per month
  - Over 5 million unique users



IEEE PES Scholar Razan Ghabin, an undergrad at Texas A&M, working on a water purification project in EL Salvador

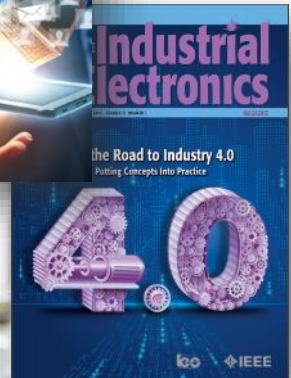


IEEE Smart Village project empowering villages in sub-saharan Africa

# What's New with IEEE Publishing

# IEEE Quality Makes an Impact

- Latest studies reinforce that the top cited publications in the world are from IEEE:
  - **23 of the top 25 journals in EE\***
  - **19 of the top 20 journals in Telecommunications**
  - **4 of the top 5 journals in Artificial Intelligence**
- **Cited in patents 3x more than any other publisher\*\***
- Recent user studies demonstrate that users rely on IEEE Xplore to:
  - Increase productivity
  - Save time by not reinventing the wheel
  - Keep up-to-date on emerging technologies



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\* Based on the Clarivate Analytics Journal Citation Report study released June 2018

\*\* Source: 1790 Analytics

More info: [www.ieee.org/citations](http://www.ieee.org/citations) and [www.ieee.org/patentcitations](http://www.ieee.org/patentcitations)



# Stay current with IEEE

The technology landscape is constantly evolving and so are IEEE publications.

IEEE introduces new publications to address growing areas of research that transform lives such as IoT, Blockchain, Big Data, Machine Learning, Renewable Energy, 5G, Autonomous Vehicles, Secure Computing, Robotics and more.

- New journal and magazine titles
- New conferences titles
- New and revised standards
- New eBooks and eLearning titles
- New tools to discover them all

Many of these technologies form the foundation of the 4th Industrial Revolution...





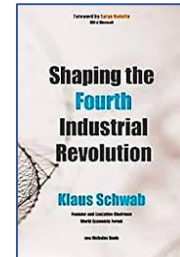
# Shaping The 4th Industrial Revolution (4IR)

- Coined by Professor Klaus Schwab, a German engineer and economist, best known as the founder and executive chairman of the WEF.
- In his book, *The Fourth Industrial Revolution*, he describes it as a range of new technologies that are fusing the physical, digital and biological worlds, and impacting all disciplines, economies, and industries
- Marked by emerging technology breakthroughs in a number of fields, including robotics, artificial intelligence, nanotechnology, quantum computing, biotechnology, the Internet of Things, 3D printing and autonomous vehicles.



"Shaping the Fourth Industrial Revolution"

World Economic Forum ✓  
Published on Sep 24, 2018



# Technologies Fueling the 4IR

Industry 4.0 refers to the convergence and application of 9 digital industrial technologies

1 

## Advanced Robotics

- ▶ Autonomous, cooperating industrial robots
- ▶ Numerous integrated sensors and standardized interfaces

2 

## 3D Printing

- ▶ 3D printing, particularly for spare parts and prototypes
- ▶ Decentralized 3D facilities to reduce transport distances and inventory

3 

## Augmented Reality

- ▶ Augmented reality for maintenance, logistics, etc.
- ▶ Display of supporting information, e.g. through glasses

4 

## Simulation

- ▶ Simulation of value networks
- ▶ Optimization based on real-time data from intelligent systems

5 

## Data Integration

- ▶ Cross-company data integration based on data transfer standards
- ▶ Pre-condition for a fully automated value chain (from supplier to customer and from management to shop floor)

6 

## Industrial Internet

- ▶ Network of machines and products
- ▶ Multidirectional communication between networked objects

7 

## Cloud

- ▶ Management of huge data volumes in open systems
- ▶ Real-time communication for production systems

8 

## Cyber Security

- ▶ Operation in network and open systems
- ▶ High level of networking between intelligent machines, products and systems

9 

## Big Data

- ▶ Full evaluation of available data
- ▶ Real time decision-making support and optimization

Source: The Boston Consulting Group, Inc., 2017



# The Impact of The Fourth Industrial Revolution (4IR)

- ▶ By 2025, it is estimated that 26-30 billion devices in the home and workplace will be equipped with sensors, processors and embedded software, and connected to the Internet of Things (IoT).
- ▶ Over 7 million jobs are at risk in some of the world's largest economies in the next five years, due to rapid technological advances in fields such as robotics and 3D printing.
- ▶ 65% of children starting primary school will eventually work in jobs that don't even exist yet.



© World Economic Forum

## Preparing for 4IR

- ▶ **Preparing for what the 4IR will bring tomorrow must begin with education today**, and leaders from business, government, civil society and the **education sector** will all need to take an active role and understand the implications.
- ▶ **Education will become even more important** as these revolutionary changes will require new skills and a thorough understanding of new technologies/systems.
- ▶ As the employment landscape is set to rapidly evolve, the idea of **future-proofing** and focusing more **heavily on advanced skills** will be increasingly necessary.
- ▶ **Universities are critical** for educating tomorrow's leaders in large part for their **continuing role in shaping future technology** by being the testbeds for innovation.



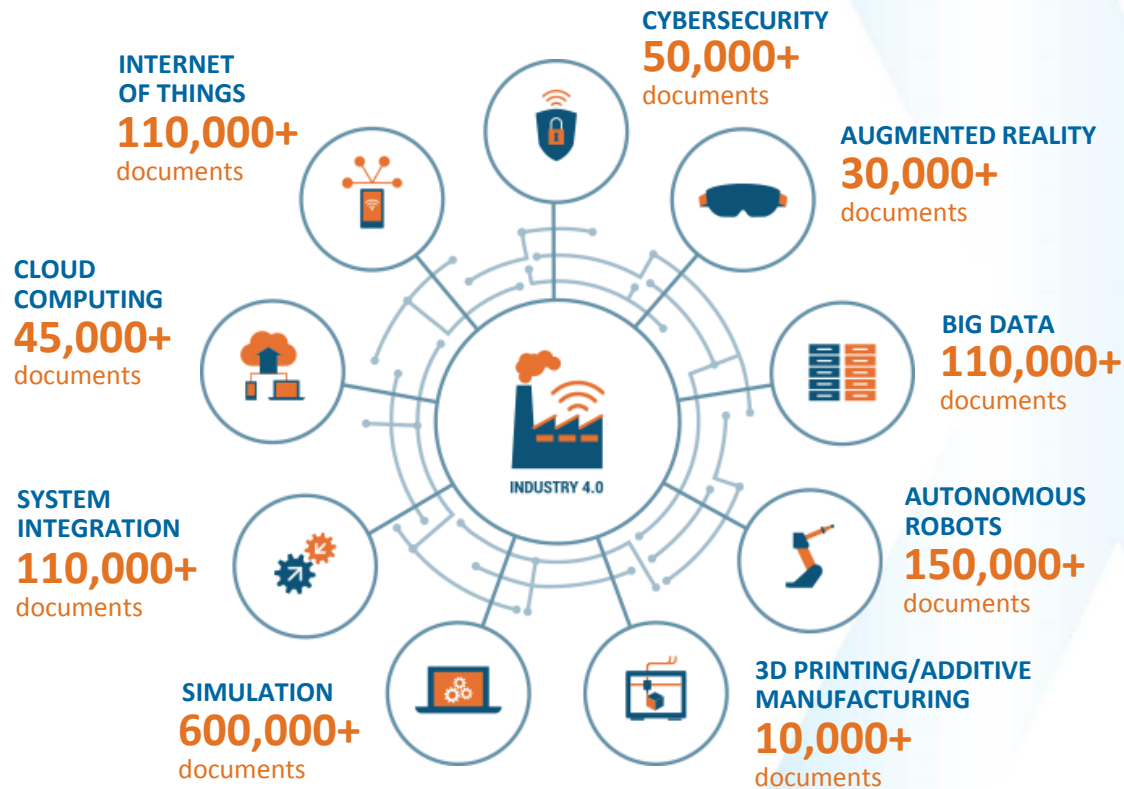
# IEEE: Your Source for Emerging Technologies Related to 4IR

Every year, IEEE introduces new journals, conferences and standards to address growing areas of research relevant to the Fourth Industrial Revolution such as **Cloud Computing, Internet of Things, Smart Grid, Autonomous Vehicles, Cyber Security** and other emerging fields.

- ▶ New journal and magazine titles
- ▶ New conferences titles
- ▶ New and revised standards
- ▶ Expanding library of eBooks and eLearning
- ▶ New, more powerful search tools to discover them all via IEEE *Xplore*



# Technologies Fueling the 4IR: Cutting-Edge Innovation Found in IEEE Xplore

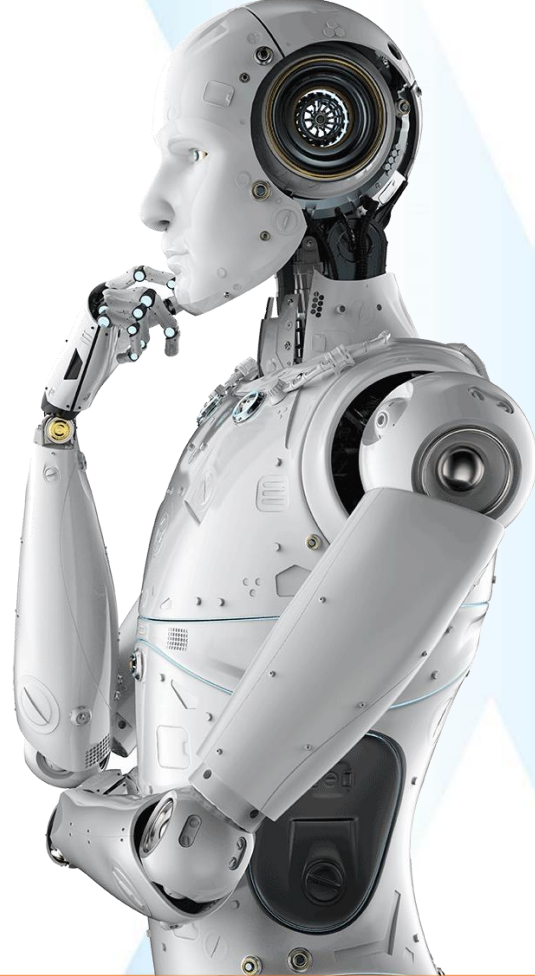




## In Conclusion

- ▶ 4IR will bring significant changes to the way we live, interact, and do business, and it is essential that leaders be prepared for these changes.
- ▶ The top innovating organizations in the world rely on IEEE information to keep up to date and help them innovate in 4IR and other emerging technologies.
- ▶ The importance of 4IR is growing worldwide and IEEE publications are constantly evolving with these technologies.
- ▶ **To see what the future of 4IR holds and stay up-to-date on these and other emerging technologies, look to IEEE *Xplore***

[www.ieee.org/ieeexplore](http://www.ieee.org/ieeexplore)



# New Content in IEEE *Xplore*



# New IEEE Journals in 2019

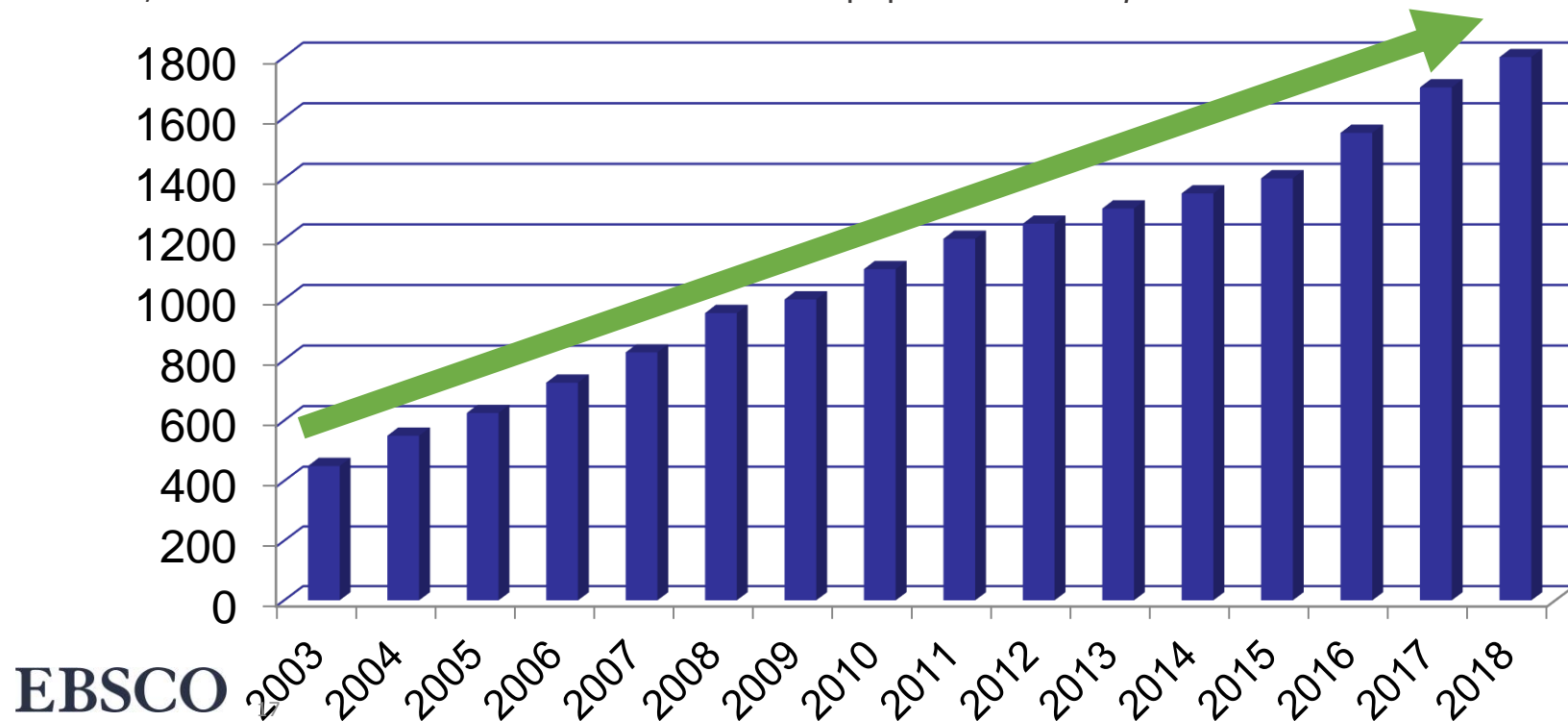
These new journal titles will soon be available and accessible via subscription:

- IEEE **Networking Letters**
- IEEE Journal on Miniaturization for **Air and Space Systems**
- IEEE Transactions on **Biometrics, Behavior and Identity Science**
- IEEE Journal on **Electromagnetic Compatibility** Practice and Applications



# The IEEE conference collection continues to grow

Over 1,800 annual conferences & 3 million total papers in IEEE *Xplore*



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# 6 Leading eBooks Collections in IEEE Xplore



The IEEE Xplore Digital Library offers instant online access to more than **3,600** high-quality, **technical eBook titles**:

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- **IEEE-Wiley Telecommunications eBooks Library**
- **MIT Press eBooks Library-Computing & Engineering**
- **Morgan & Claypool Synthesis eBooks Library**
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- **SAE eBooks Library NEW!**

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*These eBooks collections are available as an add-on to your existing IEEE Xplore subscription. Restrictions apply to certain collections, not available in all markets.*

# IEEE eLearning Library

## On-Demand Professional Development

- Online, self-paced courses designed to keep engineers and technical professionals up-to-date on core and emerging trends, leadership skills, and more.
- Courses on latest technologies, taught by the world's leading experts
- Peer reviewed by IEEE societies and experts from renowned universities and corporations worldwide
- Learners earn CEUs/PDHs upon successful completion to maintain professional licenses



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## Convenient Access Options

- IEEE *Xplore*
- Locally load SCORM files into your own LMS system
- **IEEE Learning Network**  
**Coming Soon!** New LMS specially optimized for online learning. Centralized portal with advanced LMS functionality such as tracking, managing and reporting on learner behavior



# InnovationQ Plus



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# IEEE's Expanding Open Access Program

# IEEE's Open Access Program

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- **Multidisciplinary Open Access Journal**
- **Fully Open Access Journals**—all designed to meet the varying needs of our authors throughout their careers.

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# IEEE's Open Access Programs for Institutions

For institutions, IEEE offers Open Access programs designed to make it **convenient for institutions to support and manage costs for their authors and simplify the publishing process** by paying for Article Processing Charges (APCs) in advance.

IEEE now also newly offers helpful new reporting tools such as CCC RightsLink Author (RLA) to make it easier for administrators to manage and track their accounts and APCs.

RightsLink® Author



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## Sampling of Institutional Partners



*More information on institutional options available now at [open.ieee.org](http://open.ieee.org)*



# IEEE's Open Access Program Evolves

IEEE's **publishing program continues to grow** and evolve for **both subscription journals and Open Access titles.**

IEEE continues to provide more options and choices to support the work and needs of all authors - those who prefer to publish in traditional subscription journals or those who prefer or are required to publish via OA.

To provide even more options for authors, IEEE societies are in the process of **developing 10 or more new 100% Gold OA journals** that will span a wide range of technologies including:

- Telecommunications
- Biomedical engineering
- Power and energy
- Automotive technology
- Signal processing
- Industrial applications and more!



# The IEEE Publishing Program Continues to Grow

IEEE subscription based content and usage continues to grow as well.

- IEEE plans to introduce at least **10 new subscription journals over 2 years** in cutting-edge technologies such as Medical Robotics, Internet of Things and Biometrics.
- IEEE publishes over **200,000 new articles every year** for subscribers
- Added over **47,000 new subscription journal articles in 2018** - an **increase of 4.6%** over the prior year.
- IEEE subscriptions also continue to **deliver the top cited journals in many fields** according to the most recent JCR reports.
- IEEE continues to sponsor more new conference titles, develop critical new standards and grow the collection of eBooks and eLearning courses each year.



# Stay informed on IEEE Xplore

- **Read the IEEE Xplore newsletter!**

Platform updates such as search engine upgrade  
New tools such as IEEE Xplore App  
New titles for 2019  
Technology news you can share  
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The screenshot displays the IEEE Xplore Digital Library homepage. At the top, navigation links include 'What's New', 'Just Published', 'Most Popular', 'Training Webinars', and 'Sign Up for Alerts'. A prominent banner for the 'November 2017 Newsletter' features a 'NEW! Now Available on iPhone and Android' announcement for the 'IEEE Xplore App'. The app is described as a tool to save time and stay current on the latest research, with a 'Learn More' button. Below this, the 'Innovation Spotlight' section highlights a new VR game titled 'Do VR Games Wear You Out? New Plug-In Helps Developers Personalize Exercise Intensity'. To the left, a book cover for 'Towards 5G: Applications, Requirements & Candidate Technologies' is visible. The bottom of the page shows a sidebar with 'Filter by Featured Category' and 'Most Popular Spotlight Posts'.





# The top-cited publications in the field are in IEEE Xplore

Journal Citation Reports® by Impact Factor

Each year, the Journal Citation Reports® (JCR) from Clarivate Analytics examines the impact of scholarly journals by determining how often a journal's articles are cited by later research. are:

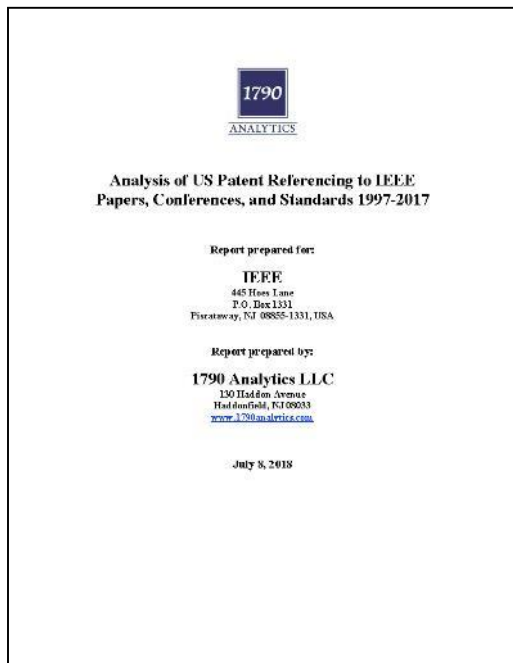
- 23 of the top 25 journals in Electrical and Electronic Engineering
- 19 of the top 20 journals in Telecommunications
- All of the top 5 journals in Computer Science, Information Systems
- 4 of the top 5 journals in Computer Science, Artificial Intelligence
- 4 of the top 5 journals in Automation & Control Systems
- 4 of the top 5 journals in Computer Science, Hardware & Architecture
- 3 of the top 5 journals in Transportation Science & Technology



Source: 2018 Journal Citation Reports (Clarivate Analytics, 2018) Based on the 2017 study, released June 2018

Journal Citation Reports present quantifiable statistical data that provide a systematic, objective way to evaluate the world's leading journals.

# IEEE research powers new patents



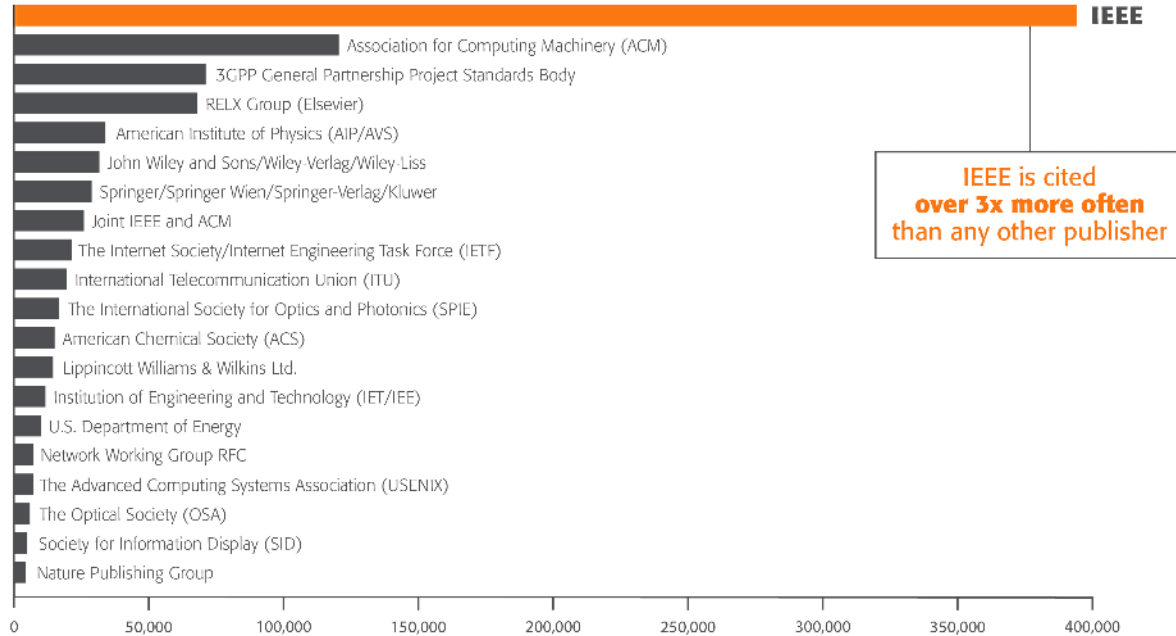
## A study of the top 30 patenting organizations ranks IEEE #1 again

- Over three times more citations than any other publisher
- Patent referencing to IEEE increased 879% since 1997
- The importance of sci-tech literature in patents is rising
- IEEE research is increasingly valuable to innovators

1790 Analytics LLC performed an in-depth analysis of the science references from top patenting firms.

# IEEE Leads US Patent Citations

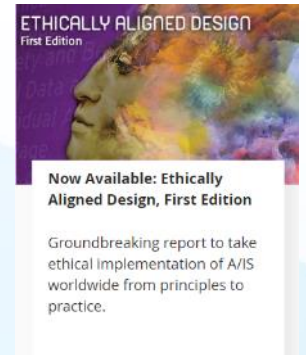
## Top 20 Publishers Referenced Most Frequently by Top 30 Patenting Organizations



# IEEE Standards

IEEE releases new versions of existing standards throughout the year and introduces many new standards. The following are a few of the standards recently added to the collection

- **IEEE 1547-2018**—IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
- **IEEE/ISO 11073-10427-2018**—ISO/IEEE International Standard—Health Informatics—Personal Health Device Communication—Part 10427: Device Specialization—Power Status Monitor of Personal Health Devices
- **IEEE 802.1Q-2018**—IEEE Standard for Local and Metropolitan Area Networks—Bridges and Bridged Networks
- **IEEE 1901.1-2018**—IEEE Standard for Medium Frequency (Less Than 12 MHz) Power Line Communications for Smart Grid Applications
- **IEEE C37.100.2-2018**—IEEE Standard for Common Requirements for Testing of AC Capacitive Current Switching Devices over 1000 V
- **IEEE 2030.7-2017**—IEEE Standard for the Specification of Micro grid Controllers
- **IEEE 802.16-2017**—IEEE Standard for Air Interface for Broadband Wireless Access Systems
- **IEEE 3006.3-2017**—IEEE Recommended Practice for Determining the Impact of Preventative Maintenance on the Reliability of Industrial and Commercial Power Systems



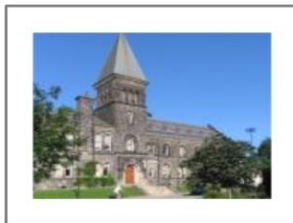
# The world's most successful technology leaders & organizations rely on IEEE information



## Technology Companies

- All of the top 20 Semiconductor companies
- All of the top 7 Communications Equipment companies
- All top 10 Aerospace companies
- 8 of the top 10 Computer Hardware companies
- 9 of the top 10 Auto & Truck Manufacturers
- 3 of the top 5 Telecommunications companies

(Forbes Global 2000 Rankings, 2018)



## Universities

- All of the top 100 engineering graduate schools in the US
- All of the top 100 Engineering and Technology Universities Worldwide

*(US News and World Report, Top Engineering Graduate Schools of 2019, ranked in 2018)*

*(Times Higher Education, Subject Ranking 2017–18: Engineering & Technology)*

\* As of August 2018

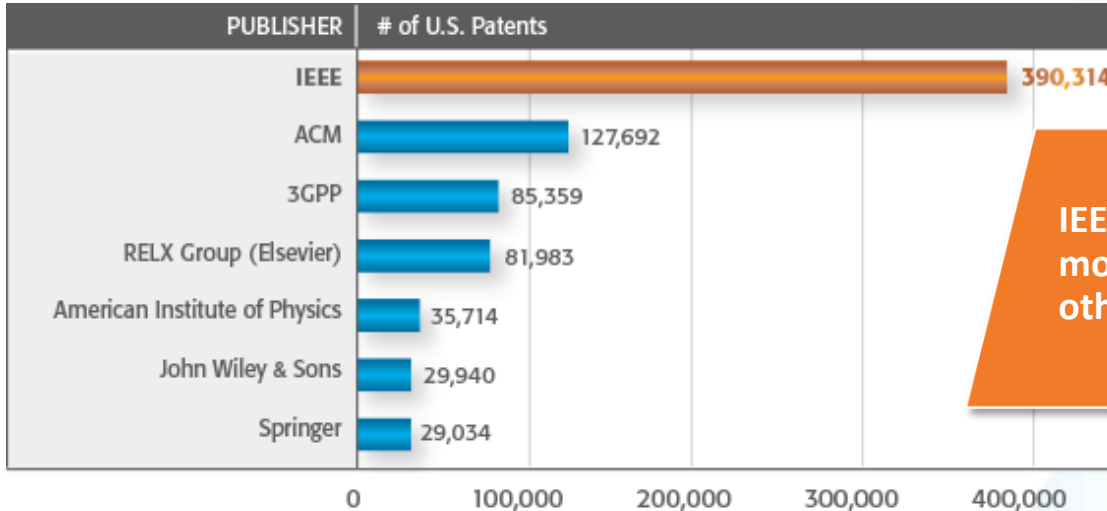


## Government

- Defense research and aerospace agencies
- Communications and energy labs
- Patent offices and scientific councils
- Government R&D centers in North America, Europe, Asia and the Middle East

# IEEE Research Powers New Patents

Number of U.S. Patent References from Top 30 Companies to Top 20 Publishers



IEEE is cited 3X  
more than any  
other publisher!

# of References to Papers/Standards/Conferences from 1997-2017 Patents  
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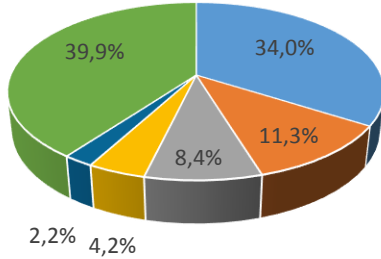
[www.ieee.org/patentcitations](http://www.ieee.org/patentcitations)



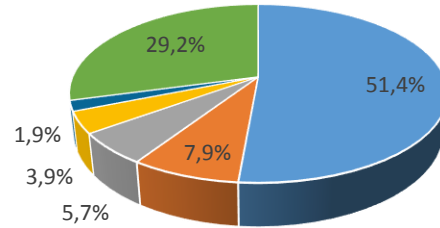
# 4IR Patents - IEEE Leads the Way

Science References to Top 4IR Technologies 1997-2017

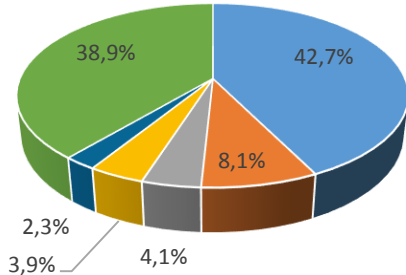
## Artificial Intelligence (AI)



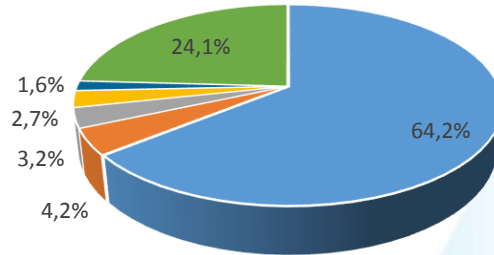
## Internet of Things (IoT)



## Robotics



## Smart Grid



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