

# Standards Development in IEEE

NIH Workshop on Standards and Modularity of Brain-  
Computer Interfaces and Neuroprostheses

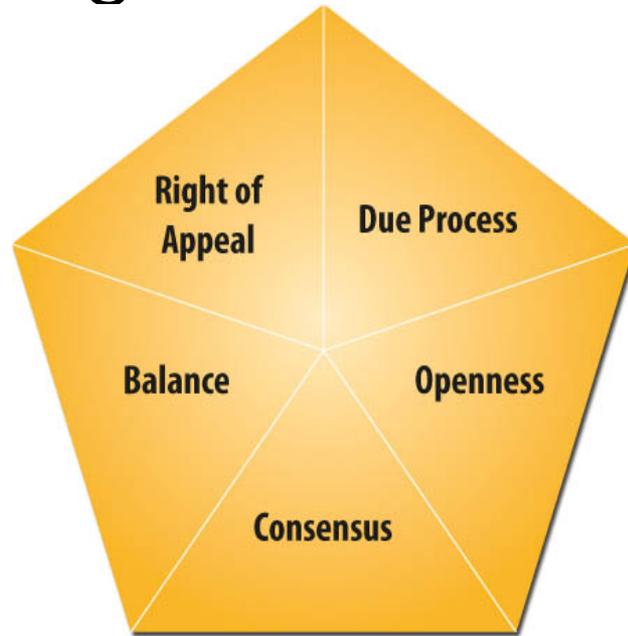
30 June, 2016

Rockville, MD

Cherry Tom,  
Emerging Technologies Intelligence Manager  
[c.tom@ieee.org](mailto:c.tom@ieee.org)

# IEEE Standards Development

Five principles guide standards development



Ensuring integrity and wide acceptance for IEEE standards

IEEE standards reflect the standardization principles as

stated by the WTO

# Guided By Five Basic Principles

Standards development follow a well-defined path from concept to completion, guided by a set of five basic principles:

1. **Due process** - Having highly visible procedures for standards creation and following them.
2. **Openness** - All interested parties can participate in the IEEE standards development process
3. **Consensus** - A clearly defined percentage of those in a balloting group vote to approve a draft of the standard
4. **Balance** - Balloting groups include all interested parties. No one party has an overwhelming influence in the balloting group.
5. **Right of appeal** - Anyone may appeal a standards development decision at any point, before or after a standard has been approved.

## IEEE-SASB Bylaws:

<http://standards.ieee.org/develop/policies/bylaws/index.html>

## IEEE-SASB Operations Manual:

<http://standards.ieee.org/develop/policies/opman/>

# Types of IEEE Standards Projects

## IEEE standards are classified as:

- **Standards:** documents with mandatory requirements.
- **Recommended practices:** documents in which procedures and positions preferred by the IEEE are presented.
- **Guides:** documents in which alternative approaches to good practice are suggested but no clear-cut recommendations are made
- **Trial-Use documents:** publications in effect for not more than two years. They can be any of the categories of standards publications listed above. A draft is usually considered for trial-use status when:
  - the WG feels the draft needs input from a broader constituency;
  - the Sponsor is unable to resolve negative ballots to a satisfactory level, or
  - when the SASB cannot attain a suitable level of approval for a draft submitted for adoption as an IEEE Standard.

## IEEE standards projects are classified as:

- **New:** A document that does not replace or modify another standard.
- **Revision:** A document that updates and replaces an existing IEEE standard.
- **Amendment:** A document that adds to, removes from, or alters material in a portion of an existing IEEE standard and may make editorial or technical corrections to that standard.
- **Corrigendum:** A document that only corrects editorial errors, technical errors, or ambiguities in an existing IEEE standard. A corrigendum does not introduce new material.
- **Erratum:** A document that contains only grammatical corrections to, or corrections of errors introduced during the publishing process of, an existing IEEE standard.

IEEE Standards Store: <http://www.techstreet.com/ieee>

# Content of Standards

IEEE standards **include but are not limited to:**

- Lists of terms, definitions, or symbols, applicable to any field of science or technology within the scope\* of IEEE;
- Expositions of scientific methods of measurement or tests of the parameters or performance of any device, apparatus, system, or phenomenon associated with the art, science, or technology of any field within the scope\* of IEEE;
- Characteristics, performance, and safety requirements associated with devices, equipment, and systems with engineering installations; and/or
- Recommendations reflecting current state-of-the-art in the application of engineering principles to any field of technology within the scope\* of IEEE

\*There is no IEEE "scope" listed on website but mission is "IEEE's core purpose is to foster technological innovation and excellence for the benefit of humanity". Individual societies and councils have scopes. Note IEEE membership qualification for IEEE designated field. The designated fields are: Engineering, Computer Sciences and Information Technology, Physical Sciences, Biological and Medical Sciences, Mathematics, Technical Communications, Education, Management, and Law and Policy.

# 5 criteria for consideration

Market potential

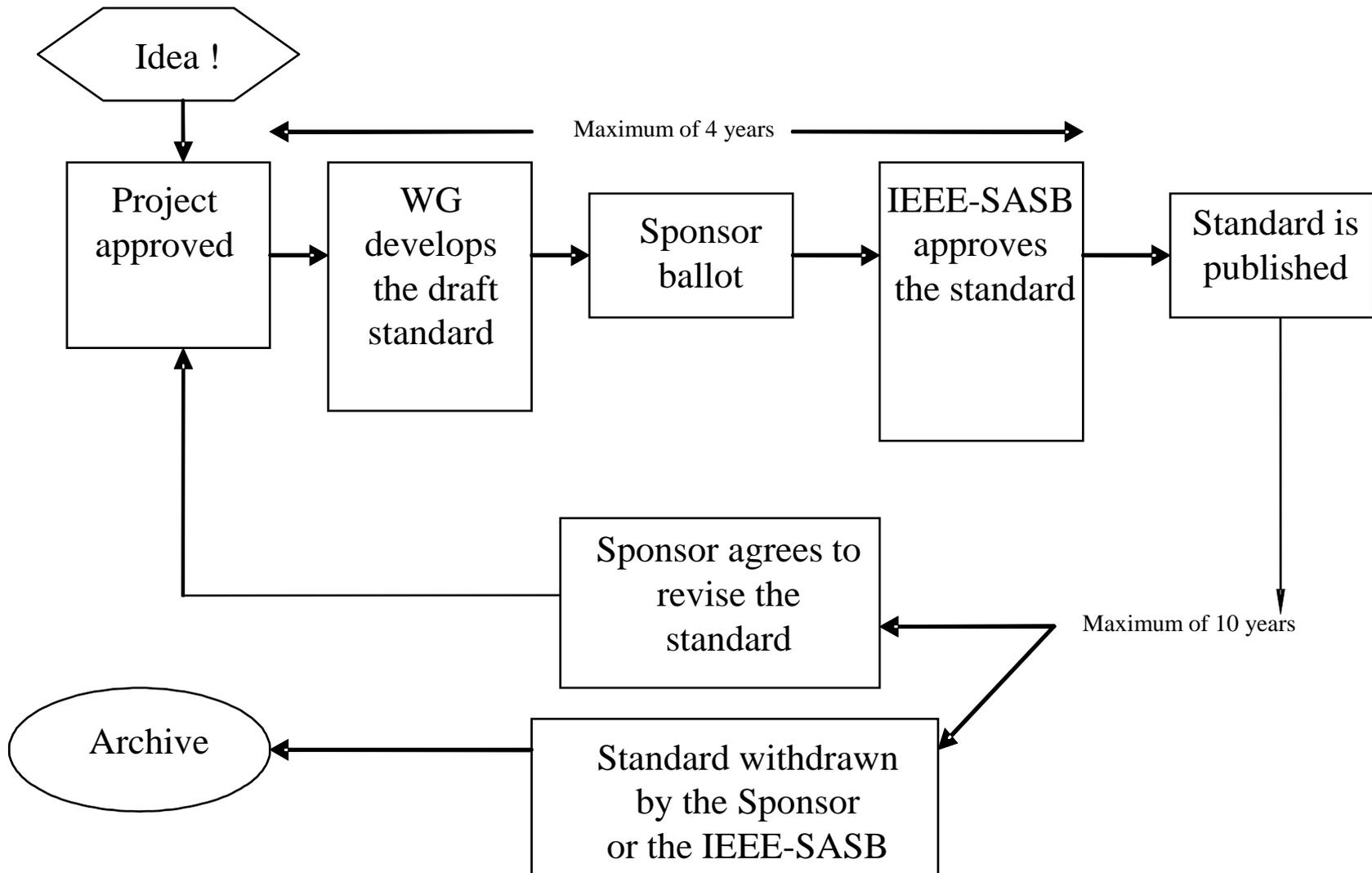
Technical feasibility

Readiness for standardization

Distinct identity (substantial technical merit when compared to other standards)

Adequate participation

# Standards Development Lifecycle



Standards Process Overview: <http://standards.ieee.org/develop/overview.html>

# Key considerations for a PAR

- Type of Document: Standard, Recommended Practice, or Guide
- Sponsoring Society and Committee (co-sponsors?)
- Sponsor Balloting Information: Individual or Entity
- Working Group
- Expected number of participants
- Scope
- Purpose
- Stakeholders
- Similar projects elsewhere?

# IEEE Sponsors – Role of the Sponsor

Organization within IEEE that assumes responsibility for a particular standards idea

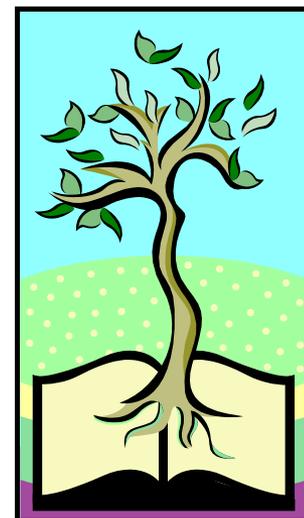
Takes responsibility for the technical content of the document and provides oversight

Responsible for determining the scope and nature of the technical content

Not a financial sponsorship

IEEE already has a large number of Sponsors

- There are the various societies within the IEEE
- Within those societies, there are often many committees that are active in standards development



# Sponsoring societies, councils, committees

AES Aerospace and Electronic Systems Society

APS Antennas and Propagation Society

BOG/CAG Corporate Advisory Group

BTS Broadcast Technology Society

CES Consumer Electronics Society

CIS Computational Intelligence Society

CS Computer Society

ComSoc Communications Society

DEI Dielectrics and Electrical Insulation Society

EDS Electron Devices Society

EDU Education Society

**EMBS Engineering in Medicine and Biology Society**

EMC Electromagnetic Compatibility Society

IAS Industry Applications Society

IES Industrial Electronics Society

IM Instrumentation and Measurement Society

MTT Microwave Theory and Techniques Society

NPS Nuclear and Plasma Sciences Society

NTC Nanotechnology Council

PE Power & Energy Society

PEL Power Electronics Society

RAS Robotics and Automation Society

RS Reliability Society

SCC4 Electrical Insulation

SCC14 Quantities, Units and Letter Symbols

SCC18 NFPA Standards

SCC20 Test and Diagnosis for Electronic Systems

SCC21 Fuel Cells, Photovoltaics, Dispersed  
Generation, and Energy Storage

SCC22 Power Quality

SCC31 Automatic Meter Reading and Energy  
Management

SCC39 International Committee on Electromagnetic  
Safety

SCC42 Transportation

Sensors Council

SMC Systems, Man, and Cybernetics Society

CRFID committee on RFID

UFFC Ultrasonics, Ferroelectrics, and Frequency  
Control Society

VT Vehicular Technology Society

# Working Groups

1. Working Groups (WG) write standards.
2. A WG can officially begin to develop a standard when the PAR is approved by the SASB.
3. The SASB can issue a call for participation to get more participants for the WG.
4. **Individual-based WGs** (one individual-one vote) are open to everyone.
  - a. Participants do not have to be IEEE, IEEE-SA, or IEEE Society members.
  - b. WG Chair and Vice-Chair shall be members of IEEE-SA and either IEEE members of any grade or IEEE Society Affiliates.
  - c. Other WG officers should be members of IEEE and IEEE-SA
5. **Entity-based WGs** (one entity-one vote) are open to IEEE-SA Corporate Members only.
  - a. All WG officers shall be representatives of IEEE-SA Advanced Corporate Members.
  - b. Only IEEE-SA Advanced Corporate Members may contribute and vote in Entity WGs. Other IEEE-SA Corporate Members may observe Entity WGs.
6. WGs operate in accordance with a written set of policies and procedures that has been approved by the Sponsor.
  - a. Baseline WG operating procedures are available at:  
<http://standards.ieee.org/about/sasb/audcom/bops.html>
  - b. AudCom will occasionally review WG P&Ps

**IEEE-SA Membership:** <http://standards.ieee.org/membership/index.html>

**IEEE Membership:** [http://www.ieee.org/membership\\_services/membership/join/index.html](http://www.ieee.org/membership_services/membership/join/index.html)

# Pre-standardization

- Within IEEE
  - **SA Industry Connections**
  - IEEE Sponsor e.g. Society, Council, CAG
    - Technical committee, research group, other groups
    - Study Group
  - Other IEEE groups e.g. subgroups under FDC initiatives
- Affiliated with IEEE
  - IEEE-ISTO (IEEE Industry Standards and Technology Organization)
- Outside of IEEE
  - Alliances, trade organizations,....
  - Government agencies
  - Companies
  - Individuals

# Industry Connections (IC) Program

- ❑ **A neutral & economical environment for building consensus**
  - Supports incubation of new technologies, standards and related services
  - Help individuals or entities solve shared problems and produce shared results
  - Minimal effort, time and expense to begin collaborative work
  - Respected, neutral, third-party home for activities and results
  - Flexible options for evolution, transition and conclusion of activities
  
- ❑ **Not just for “Industry”. Two types of IC activities:**
  - Individual-based: Activity members are individuals with any affiliation. Voting (if needed) is one vote per individual.
  - Entity-based: Activity members are entities. Voting (if needed) is one vote per entity.
    - Entities are corporations, government agencies, academic institutions, trade associations, NGOs, etc.
  
- ❑ **Complements IEEE-SA “formal” standards activities**

# Possible Outputs of IC Activities

- Proposals for standards
- White papers
- Peer-reviewed guides and position papers
- Workshops and other events
- Databases and registration services
- Software, tools and web services
- Other jointly developed results

# Brain.ieee.org

IEEE.org | IEEE Xplore Digital Library | IEEE Standards | IEEE Spectrum | More Sites



Search

Join the IEEE Brain Community

[Home](#) [News](#) [Upcoming Events](#) [Featured Articles & Videos](#) [About IEEE Brain](#)



## Featured Video

How are Words Organized in the Brain? Nature Video.  
Watch the video below, then [Learn More at the Gallant Lab at UC Berkeley](#)



## News

**Featured:** Tentative Schedule for SMC2016 BMI Workshop: 10/8-9 Brain Hackathon, 10/9 Standards Meeting, BMI Tutorials, and Open Reception, 10/11 Brain Initiative Meeting

TBME: BRAIN Special Issue

First IEEE Brain Initiative Meeting Held at Columbia University in December 2015

## Upcoming Events

NIH Workshop on Standards and Modularity of Brain-Computer Interfaces and Neuroprostheses, 30 June, Rockville, MD

EMBC16 BRAIN Plenary Symposium, 17 August, Orlando, FL

Early discounted registration ends 9th July for SMC2016 BMI Workshop, 9-12 October, Budapest, Hungary

IEEE Brain Initiative to give Best Paper Award at and Student Travel Grants to SMC2016 BMI Workshop

# IEEE Brain Initiative – SA focus area

Promote the commercialization and standardization of neurotechnology

## SA active in topics related to IEEE Brain Initiative objective

### Examples of related SA standards and projects

- IEEE 2010-2012 IEEE Recommended Practice for Neurofeedback Systems
- IEEE 11073 health informatics - standard series for medical device communications
- IEEE 3333.1.1-2015 IEEE Standard for Quality of Experience (QoE) and Visual-Comfort Assessments of Three-Dimensional (3D) Contents Based on Psychophysical Studies
- IEEE P3333.1.2 Standard for the Perceptual Quality Assessment of Three Dimensional (3D) Contents based on Physiological Mechanisms
- IEEE P1589 Standard for an Augmented Reality Learning Experience Model
- IEEE P1918.1 Tactile Internet: Application Scenarios, Definitions and Terminology, Architecture, Functions, and Technical Assumptions

Other related examples include standards and projects in robotics, sensors, IoT and new prestandards activities for Big Data

Prestandardization in Industry Connections activities for Smart Glasses Roadmap, 3D Body Processing, The Global Initiative for Ethical Considerations in the Design of Autonomous Systems

**Example future topics: interoperability, performance, definitions, privacy**

**Example future application areas: assistive devices, education, entertainment**

# Questions?

Cherry Tom  
Emerging Technologies Intelligence Manager  
IEEE Standards Association  
[c.tom@ieee.org](mailto:c.tom@ieee.org)  
+1.732.465.5848 Office

**Visit the IEEE-SA web site:**  
<http://standards.ieee.org>

# Back up slides

# Study Groups

1. Officially, a standards project does not exist until a PAR is approved.
2. Members of a potential WG may meet to work on a PAR and to gain the support of their potential Sponsor. This type of gathering, known as a Study Group (SG), can exist for up to six months before a PAR needs to be submitted.
3. The purpose of the SG is to determine whether sufficient interest and resources exist to develop an IEEE draft standard, and if so, to develop a draft PAR for the proposed project.
4. Guidelines for how Study Groups should conduct business are available at <http://standards.ieee.org/develop/corpchan/studygrp.pdf>
5. Key guidelines for Study Groups:
  - a. SG is formed as a subgroup of the Sponsor
  - b. Sponsor appoints the SG Chair
  - c. SG Chair appoints a Secretary
  - d. Sponsor defines tasks for the SG with specific output(s) and the time frame for accomplishing the tasks.
  - e. SGs should follow the NesCom Conventions when preparing the PAR: <http://standards.ieee.org/about/sasb/nescom/conv.html>
  - f. SGs must follow the IEEE-SA antitrust policies: <http://standards.ieee.org/develop/policies/antitrust.pdf>
  - g. Individual SGs should have at least 5 members. (One vote per individual)
  - h. Entity SGs should have at least 3 entities participating. (One vote per entity)