

IEEE P4001 Hyperspectral Standards Working Group

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GRSG
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The Need for Hyperspectral Imaging Standards

- No existing external standards
- Fragmentation of specification reporting
- Non-comparable measurement techniques
- Lack of uniformity in RFI, RFP and Contracting requirements/responses
- New platforms and sensor designs
- Increasing range of applications

Technical Focus of the P4001 Effort

- Providing basic tools, test recommendations and procedures for absolute characterization of HSI instruments to ensure proper performance and consistent reporting
- Passive, reflective domain: Visible, NIR and SWIR Sensors (350-2500nm)
- Platform agnostic: Airborne, Handheld and/or Benchtop
- Address Pushbroom, Whiskbroom, Snapshot, and Tunable designs
- Establish a Foundation for future efforts to other spectral regions and instrument architectures.

Hyperspectral Imaging Standards

- P4001 standards will include:
 - Characterization methodologies
 - Nomenclature and terminology refinement
 - Instrument performance metrics
 - Reporting structure with distinctions between required, recommended, and optional
- P4001 standards will not include:
 - Application specific performances
 - Post image correction and radiometric calibration processes
 - For example: Atmospheric compensation
 - Benchmarking



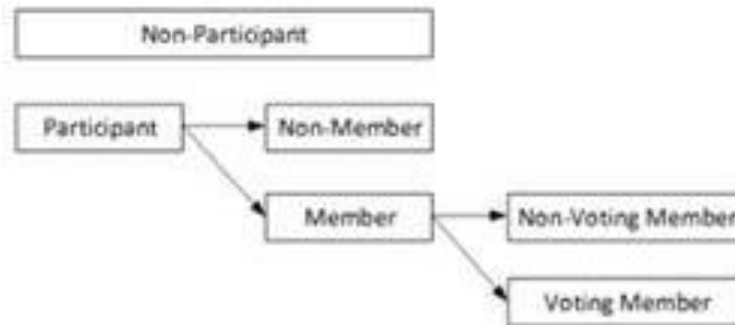
- **Officers:**
 - Chair - Chris Durell, Labsphere (USA)
 - Co-Chair - Dr. David Allen, NIST (USA)
 - Secretary - Dr. John Gilchrist, Camlin Group (UK)
 - Webmaster - Alex Fong, Hinalea Imaging (USA)
 - IEEE/GRSS Chair - Dr. Siri Jodha Khalsa (USA/Czech)
- 50+ Voting Members , >200 Participants from 15+ countries
- ~4-6 week mix of virtual online meetings and conference sessions including:
 - IGARSS (Valencia, Spain)- July 24, 2018
 - Photonics West (San Francisco, US)- February, 2019
 - SPIE Defense & Commercial Sensing (Baltimore, US)- April, 2019
 - IGARSS (Yokohama, Japan) - July 2019

- Terminology – WG-T1
 - Chair: Oliver Weatherbee, SpecTIR (USA)
- Characterization – WG-C1
 - Chair: Andreas Baumgartner, DLR (Germany) – lead on stray light
 - Vice Chair: Torbjorn Skauli, FFI (Norway) – lead on physical, environmental, temporal, and interface characterization
 - Vice Chair: Kwok Wong, Headwall (USA) – lead on radiometric performance
 - Vice Chair: Andrei Fridman, NEO (Norway) – lead on spectral and geometric performance
- Data Structures – WG-D1
 - Chair: Naresh K. Mallenahalli, NRSC/ISRO (India)

Support of other standards groups is welcome

- EMVA-1288 processes and tests are being used as reference material to the new P4001 efforts.
- TC211 for ISO has also lent their support to the P4001 group on data structures and standards
 - Joint development would require submitting a proposal for approval by Members
 - WG could also develop and publish as IEEE standard and then take to ISO for rebranding as a derived work, possibly with modifications.
 - May require cooperative agreement between IEEE-SA and ISO/TC211
- DIN Standards organization (Germany) – cooperative participation

GRSS & IEEE P4001 Participation



Levels of Participation:

- **Observer (Participant):**
 - May attend meetings but shall not participate in discussions and/or voting.
- **Non-Voting Member:**
 - An non-member can become a non-voting member by attending one meeting and requesting membership from the Chair.
- **Voting Member (Granted to all those in attendance of an inaugural meeting of a working group):**
 - A non-voting member can become a voting member by attending 2 consecutive meetings and requesting voting membership from the Chair.
 - Status is maintained by missing no more than one consecutive meeting. If voting membership is lost it can be regained again but attending two consecutive meetings.

P4001 Chair: Chris Durell (cdurell@labsphere.com)

Thank You

