



AESS VISION
2020

Technical Operations – SMART Objectives Review
Action Items, Motion for a New Panel, & Appendix
George Schmidt

Separate accompanying documents include a proposal for a new AES panel and the C.V. of its Chair.

April 26-27, 2019

Boston, MA, USA

Technical Operations 3-Year Goals

1. Identify topics and potential leaders for new areas within our fields-of-interest where technical activities should be pursued
2. Review all technical panels for relevance, activity and leadership. Seek revitalization of those technical panels that may be dormant or lagging, and drop those whose relevance or currency has expired. Seek to expand the portfolios of each panel, as well as, its membership.
3. Implement guidance in the form of best panel practices from initial proposal of the panel through on-going operations and recognize outstanding technical panels achieving their goals
4. In collaboration with Conferences, identify and recruit AESS members from technical panels and elsewhere to participate in organizing AESS conferences
5. In collaboration with Education, promote interaction between technical panels and local AESS chapters by increasing the number of DLs on panels.
6. In collaboration with Publications, have each panel produce an annual technical contribution to Systems, and contribute to the QEB.

2019 Technical Operations Objective

- S** – Review of all Panels for activity, communication, adherence to new Panel Policies, Procedures and Best Practices
- M** – Jan: Provide new Policies, Procedures and Best Practices to Panels
 May: Review actions relative to Panel Chair “To Do List”
 June: Provide feedback to Panel Chairs. Select Best Panel
- A** – Assigned to: Schmidt, Braasch, and Griffiths
- R** – Relevant to which goal(s)? #2, #3, #6
- T** – Time period for performance: Feb – June 2019

Policies, Procedures, and Best Practices IEEE AESS PANELS 2019

**Prepared by the Technical Operations
Committee**

Contents:

- 1. Applying for Panel Approval**
- 2. Forming an Approved Panel**
- 3. "Best" Panel Operating Procedures**

2019 Technical Operations Objective

S – Reorganize the Avionics Systems Panel (ASP)

M- January- Complete solicitation of new members

February- Election of Chair and Vice Chair. Kickoff “meeting” prior to ICNS

April- Work with new chair in organizing the new ASP according to new Panel, Policies, and Best Practices.

A – Assigned to: Schmidt

R – Relevant to which goal(s) and how? 2,5

T – Time period for performance: Jan-Oct 2019

Introduction

■ The Avionics Systems Panel (ASP) leadership was elected in February, 2019:

- Chair: Alope Roy
- Vice Chair: Roberto Sabatini
- Initial members of the Panel: George Andrew, Erik Blasch, David Brown, Christopher Camargo, Giancarmine Fasano, Omar Garciacrespillo; Kathleen Kramer, Irfan Majid

■ PURPOSE:

- To promote and support collaborative research initiatives in the domain of Avionics;
- To promote and support high-quality IEEE publications in the domain of Avionics;
- To promote and support educational activities in the domain of Avionics;
- To sustain and oversee the programs of the IEEE/AIAA Digital Avionics Systems Conference (DASC), the Integrated Communications Navigation and Surveillance Conference (ICNS); and create new conferences or partnerships;
- To establish a liaison and joint work program with the Cyber Security Panel;
- To establish a liaison and joint work program with the Unmanned Air Vehicle (UAV) Panel;
- To manage the nomination and selection of candidates for IEEE Awards in the domain of Avionics;
- To encourage the submission of nominations for IEEE Fellows and Senior Members in the domain of Avionics;
- To recommend and support new IEEE Standards or revisions of existing IEEE standards pertaining to the domain of Avionics;

2019 Technical Operations Objective

- S** – Determine if a Fusion Panel is necessary and supportable with enough members to provide a portfolio of activities
- M** – By April BoG Mtg: determine if there is supportable interest
By Sept 1: Follow new Policy & Procedures in presenting a proposal to VP Tech Ops for approval and BoG vote in Oct
By Nov 1: Get Panel organized and moving
- A** – Assigned to: Lead S. Coraluppi
- R** – Relevant to which goal(s)? #1, #3
- T** – Time period for performance: From Feb-Dec 2019

2019 Technical Operations Objective

S – Use the GAP analysis relative to DLs and Panels and work with Education to include Panel recommendations for DLs and for DLs to become members of Panels

M – At the end of the year, compare the number and distribution of DLs with technical interests associated with each Panel or on each Panel. (+2 new DLs from Panels 1/19:UAV and NSP)

A – Assigned to: Schmidt

R – Relevant to which goal(s) and how? #4

T – Time period for performance: 2019

2019 Technical Operations Objective

- S** – Have Panels produce an annual article for Systems and improve inputs to QEB
- M** – All Panels contributing to both. (100% for recent QEB)
- A** – Assigned to: Schmidt and Panel Chairs
- R** – Relevant to which goal(s)? #6
- T** – Time period for performance: Ongoing. Panel Chair selection of Systems authors June 1.

Panel Volunteers for 2018 Systems Articles

Assigned AESS Panel	Authors
Cyber Security	Kathleen Kramer and Erik Blasch (Special Issue Organizers)- In Process
Navigation Systems	Zak Kassas (submitted)
Radar Systems	Willie Nel (submitted)
Space Systems	Cosimo Stallo (no submission yet)
UAV/UAS	Kai Lothan John and Sabrina John (no submission yet)

4/27/2020

2019 Technical Operations Objective

S – Determine topics and potential leaders for Future Directions

M – By April BoG Mtg: PPT Status Presentation
For Oct BoG Mtg: PPT Summary on “The Way Forward”

A – Assigned to: Lead M. Ruggieri, Entire Committee

R – Relevant to which goal(s)? #1

T – Time period for performance: Feb 2019- Dec 2019

2019 Tech Ops Committee: Organization, Activities & Future Directions

Marina Ruggieri, *Chair*
Tech Ops Future Directions Committee

Report Submitted to:
George Schmidt, VP- Technical Operations

April 22, 2019

Tech Ops Committee – Composition

- **Composition:** Michael Braasch
Michael Cardinale
Stefano Coraluppi
Mark Davis
Yonina Eldar
Hugh Griffiths
Marina Ruggieri (Chair)
George Schmidt (VP, TechOps)

Tech Ops Committee – Organization & Activities

▣ Assignment to Panels:

NSP - *Michael Braasch*

UAV - *Mark Davis*

RSP - *Hugh Griffiths*

CyberSec – *Kathleen Kramer*

SSP* - *Marina Ruggieri*

ASP* - *George Schmidt***

* **shut-down & re-start** **no assignment for GAP and ACGSP (George takes care of)

Tech Ops Committee – Organization & Activities

- **Search sub-committee on “new topics”:**

Michael Cardinale

Stefano Coraluppi

Yonina Eldar

Hugh Griffiths

(with Marina’s and George’s support)

Future Directions

Inputs from Tech Ops Committee members, Panels



- **Thinking about a new Conference (NSP)**
- **Thinking about a new Conference under a multi-panel cooperation (ASP)**
- **New topics with a multi-panel cooperation (UAV)**
- **Maintaining current organization and activities (GAP)**
- **Increasing high quality papers both for TAES and SYSTEMS (NSP)**
- **Planning joint activities/joint sessions at AESS conferences (ACGSP)**
- **Interaction in the panel with Conferences, educational aspects/DLs, special issues (CyberSec)**
- **Space Systems matter reorganized into 2 new panels (SSP)**

Future Directions – more details



ACGSP

Five subcommittees: Aeronautical and Surface Vehicles; Missiles and Space Vehicles; Avionics and Systems integration; Dynamics, Computation, and Analysis Flight, Propulsion; Autonomous Control Systems

Tentative AESS Briefing at their Fall Meeting (Briefings not papers. No marketing types)

ASP

Great start for the panel with outstanding founding members.

Unique near-term opportunity exists to liaison and work jointly with Cyber Security and UAV Panels for a new IEEE conference. Potential for Radar Systems, Navigation, and Space Systems to also participate

Future Directions – more details



GAP

Composed of industry, government laboratories, educational institutions, and professional society members

Panel is well-staffed with international experts capable of revising or originating standards as new instruments/concepts are developed

NSP

Discussing launching the 'IEEE Navigation Conference'

Discussing the negative impact that IEEE's policy against double-publishing is having on PLANS [potential solution: Robotics and Automation – Letters and Conference Presentations]

Future Directions – more details



RSP

Provided RSP operational improvements

Provided a vision of technology improvements and future radar directions (see Appendix)

Mark Davis provided a vision for UAV radar applications for UAV systems

Future Directions – more details



UAV

Radar Applications for UAV Systems

Unmanned Air Vehicles or Drones have made significant contributions for commercial and private surveillance:

- **Monitoring electrical towers, cables and power generation**
- **Characterizing wide areas of Forests and Crops for carbon changes in the environment**
- **Civilian monitoring of farm lands and animal herds**

Each of the applications can use all weather, day night operations of Radar.

Future Directions – more details



UAV

Technologies For UAV Radars

Small, light weight radar front ends:

- Single chip radars and direct digitalization of waveforms
- Very low power signal processing for long operation
- Waveform and polarization capabilities for fine resolution and characterization of crops, forests, remote structures
- Alternative wavelengths for wideband operation



This prompts the cooperation of the Radar Systems and UAV Panels for future Conferences

Future Directions – more details



CyberSec (1/3)

Cyber Security Engineering – which panel chair helped draft approved accreditation criteria for was the theme of April 11-12 ABET Symposium (sold out). Cyber criteria approved for 1st reading July 2018 and expected to be approved July 2019.

ICCST is a “security” conference – so it’s very strong on “security” not necessarily cyber or related to AESS interests, and has few AESS involved, but does certainly include such and has tracks that are in interests of panel.

DASC is an Avionics and Air Traffic Management conference – covering both air and space, so there is a Cyber track and a Cyber tutorial, but it does not constitute the majority of the conference.

Success with special issue, but need for tutorial both in resource center and in magazine. Multiple efforts by several panelists to get these have not panned out.

Future Directions – more details



CyberSec (2/3)

Membership is “open” – this allows interested members, particularly conference track and tutorial leaders in niche to be involved but also brings “volunteers” whose interest is self- and center- promotion and provides little organizing support (currently 17 members - new member: Joe Dauncey - Chief Information Security Officer for the UK National Air Traffic Services)

Chairs of both DASC and ICCST are involved in the panel

Two of the members are DLs and third is chair of Avionics panel. They’re the 3 most involved with the Cyber panel. This is both a blessing and a curse as the Avionics panel is rebooted, given the pulls on all involved.

Future Directions – more details



CyberSec (3/3)

Both involved conferences are late in the year. This leads to overweighting of effort in September and October and little communication and opportunity for activities in first half of year.

Successful in having panel meetings at both conferences (objective: two panel meetings per year incorporated into program of DASC and ICCST)

Distribution over two conferences and lack of commitment from individuals to both the panel and the conferences means *members are not necessarily at either conference* and little/no overlap in meeting attendance.

Special Issue

Add to Resource Center and DLs

Future Directions – more details



■ **Space Systems matter fully reorganized in two Panels:**

Glue Technologies for Space Systems* – chair: *Claudio Sacchi* [examples of areas: Space-SDN/NFV; EHF connectivity]

**this NEW panel would become the main AESS panel on Space Systems, replacing SSP which will be either shut-down or put in stand-by mode to be transformed later in a second panel on space matters*

Vertical Applications of Space Systems – chair: *tbd*

**this panel could be either the result of the current SSP transformation or a new panel that could be launched ONLY AFTER the current SSP shut-down and a suitable adjustment timeframe for the Glue Technologies panel*

SS-GLUE TECH Panel

- **Proposal for a new IEEE AES panel (see separate Word document)**
-
- **GLUE TECHNOLOGIES FOR SPACE SYSTEMS**
- **(SS-GlueTech Panel)**
- **Proposers:**
- **Claudio Sacchi**
-
- *University of Trento, Dept. of Information Engineering and Computer Science (DISI)*
- *Trento, Italy, e-mail: claudio.sacchi@unitn.it*
-
- **Marina Ruggieri**
-
- *University of Rome "Tor Vergata", Department of Electronic Engineering/CTIF*
- *Roma, Italy, e-mail: ruggieri@uniroma2.it*

Future Directions – more details

Glue Technologies for Space Systems (SS_GlueTech)

chair: **Claudio Sacchi** (*a detailed proposal is available*)

❑ **11 Founding Members**

❑ **Example of thematic areas:**

- Broadband transmissions, including mm-wave radio frequency (Q/V, W-band and beyond) and free-space optical links
- Softwarization of space networking (Software Defined Radio, Software Defined Networking, Cloud RAN in the Space, resource virtualization)
- Internet of Remote Things (IoRT) and Internet of Space Things (IoST)
- Augmented 3D reality for manned exploration missions (e.g. on Mars)



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SS-GLUE TECH Panel

Panel founder members

- Kar-Ming Cheung (Jet Propulsion Lab, Pasadena, CA);
- Nicola Conci (University of Trento, Italy), IEEE member, SPS;
- Fabrizio Granelli (University of Trento, Italy), IEEE Senior member, ComSoc;
- Mario Marchese (University of Genoa, Italy), IEEE Senior member, ComSoc;
- Maurizio Murrioni (University of Cagliari, Italy), IEEE Senior member, BTS;
- Vlad Popescu (University of Transilvania, Brasov, Romania), IEEE member, BTS;
- Michael Rice (Brigham Young University, Provo, UT), IEEE Fellow, AESS;
- Tommaso Rossi (University of Rome "Tor Vergata", Italy), Space Systems Associate Editor, TAES
- Christian Schlegel (Dalhousie University of Halifax, NS, Canada) , IEEE Fellow;

■

Invited members (pending reply)

- Stefano Coraluppi (Systems and Technology Research, Woburn, MA), IEEE Senior member, AESS;
- Alessandra Babuscia (Jet Propulsion Lab, Pasadena, CA);
- Michael Devetsikiotis (University of New Mexico, Albuquerque, NM);
- Eugene Grayver (Aerospace Corporation, El Segundo, CA);
- David A. Taggart (Aerospace Corporation, El Segundo, CA).

28 ■ It may change!

SS-GLUE TECH Panel

Major activities of the panel

- Organization of special sessions and/or workshops in IEEE AESS conferences and workshops;
- Organization of new conferences and events;
- Organization of special issues in IEEE journals concerning the topics listed in the technical areas;
- Coordination with the activities of international standardization bodies and funding agencies working in the field of satellite communications and networking;
- Operative liaisons with other IEEE satellite panels and committees (e.g. Satellite and Space Communications (SSC) technical committee of ComSoc) and with other scientific and technical associations (AIAA, ACM, etc.);
- Support to AESS-related awarding activities;
- Support to student grants, Master and PhD thesis award, stimulating the participation of the students to the AESS activities and to the panel activities;
- Support to international doctoral summer schools.

SS-GLUE TECH Panel

Objectives

- Establish an enduring relationship with the IEEE Aerospace Conference, as main AESS event of Space Science and Technology. Organization of one or two special sessions during the IEEE Aerospace Conference, since the first edition of the conference after the panel approval and, in two years, organization of a track in the aforesaid conference;
- Organization of a conference in Europe, sponsored by IEEE AESS, and focused on the panel topics at most 2 years after the panel approval;
- Journal special issue proposals: at least one every two years;
- Support and organization of a yearly or bi-annual international doctoral Summer school with the AESS panel label;
- Setting up a panel web site and publication of periodical newsletters. Publication of a yearly panel activity report, approved during the September meeting.

SS-GLUE TECH Panel

Motion:

That based on the recommendation of the Vice President, Technical Operations the Board of Governors establish a Glue Technologies for Space Systems Panel effective April 26, 2019.

TECH OPS COMMITTEE

Thank you for your attention!

Tech Ops Standard Panel Reports-- Appendix

Aerospace Control and Guidance

Avionics Systems

Cyber Security

Gyro & Accelerometer

Navigation Systems

Radar Systems

Space Systems

UAV

2019 Technical Operations

Aerospace Control & Guidance Systems

Marge Draper-donley

AEROSPACE CONTROL and GUIDANCE

- Annual 1-day short course
- Competitive award lecture for young engineers
- Meeting locations to facilitate relevant tours when possible
- Continued dissemination of semi-annual meetings info within AESS/on-going Panel interaction

- Invited talks across gov't, industry, universities
- Recent aerospace activity on Panel Topics of interest

- Aircraft and surface vehicles
- Missiles and Space
- Avionics and Systems
- Dynamics and Analysis
- Flight, Propulsion, Autonomous Control

- 10/10-10/12/18 Savannah, GA
- 3/27-29/19 Santa Fe, NM

Initiatives Updates

- One day Short Course planned 3/26/19 prior to Mtg 123
 - Topic: Aircraft System Identification in the Frequency Domain
- Last Short Course April 10, 2018 Tucson, AZ
- Newest competitive lecture award nominations for 2019 (Dave Ward Memorial Award) expected to open late May/early June 2019 with selection in September in time for Fall ACGSC Meeting 124 in late Oct
 - We encourage mentors/advisors/supervisors to nominate an outstanding young professional (<35) engineer/scientist
 - Nomination process online (Expenses paid to attend Fall meeting and give lecture on topic)

Upcoming Meeting Plans

- Meeting123, Santa Fe, NM March 27-29, 2019
 - Will have 3 days of committee short and full briefings within the indicated panel topic areas
 - Will be preceded by short course on System Identification on March 26, taught by Dr. Gene Morelli, NASA Langley

2019 Technical Operations

Avionics Systems Panel

Aloke Roy

Introduction

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- To establish a liaison and joint work program with the Cyber Security Panel;
- To establish a liaison and joint work program with the Unmanned Air Vehicle (UAV) Panel;
- To manage the nomination and selection of candidates for IEEE Awards in the domain of Avionics;
- To encourage the submission of nominations for IEEE Fellows and Senior Members in the domain of Avionics;
- To recommend and support new IEEE Standards or revisions of existing IEEE standards pertaining to the domain of Avionics;

ASP Accomplishments in February

- ASP Kick-off teleconference held on February 28, 2019
- Finalized the Charter of the ASP and established 9 working committees under ASP:
 - Avionics Research and Innovation Committee: addressing key contemporary issues in avionics systems Research, Development, Test and Evaluation (RDT&E)
 - Avionics Conference Committee : responsible for supporting and selecting volunteers for the Digital Avionics Systems Conference (DASC), the Integrated Communications, Navigation and Surveillance Conference (ICNS) & creating new conferences or partnerships
 - Awards Committee: responsible for selecting nominations for the IEEE and AESS Awards in the domain of avionics, and conducting a selection based on ASP established procedures.
 - Standards Committee: responsible for coordination with IEEE Standards committees to identify needs for avionics standards; promotes new IEEE standards and/or revisions of existing standards that are related to avionics
 - Education Committee: responsible for advancing the education, publications, and IEEE member levels of students or new members of the Avionics community.
 - Journal Publications Liaison Committee: responsible for establishing and sustaining a joint work program with the avionics systems streams of the IEEE Transactions on Aerospace and Electronic Systems (TAES) & for the AESS Systems (SYS) Magazine and other journals
 - Nomination and Elections Committee: responsible for the process of nomination of Panel Chair and Vice-Chair, IEEE Senior Members and Fellows
 - Cyber Security Panel Liaison Committee: responsible for establishing a joint work program with the AESS Cyber Security Panel to address avionics systems cyber security needs
 - UAV Panel Liaison Committee: responsible for establishing a joint work program with the AESS UAV Panel to promote cross fertilization of technology research.

ASP Work Program for 2019

- Work with ICNS Executive Committee (IEC) to ensure successful ICNS Conference in April
- Recruit additional members from industry and academia to support the ASP committees and kick off respective activities
- Plan joint activities with AESS Cyber Panel and the UAV Panel – possibly to coincide with the Digital Avionics Systems Conference (DASC)
- Support and work with AIAA Digital Avionics Technical Committee (DATC) to ensure successful execution of DASC
- Plan Young Professional educational sessions and tutorials at DASC
- Develop IEEE/AESS awards for ASP administration
- Develop operating budget for ASP and coordinate with AESS Tech Ops and IEEE Financial Committees for approval
- Schedule monthly web conferences to manage and execute work programs of the underlying committees

Cyber Security Technical Panel Future Directions

Kathleen Kramer, Panel Chair

Report Submitted to:

George Schmidt, VP- Technical Operations

**Marina Ruggieri, Chair – Technical Operations Future
Directions**

September 2018

Cyber Security – Future Directions Opportunities and Issues

■ AESS Technical Interests and Cyber

- Goal: More coverage (DLs, articles, meetings, resource center) and to build more clarity of topics specific to AESS technical operations vs Cyber security as a general topic.
 - There is an overlap of 3 with the Avionics TechOps panel which helps support expertise and AESS fields of interest in cyber.
- [FD Opportunities and issues](#)
- Cyber Security Engineering – which panel chair helped draft approved accreditation criteria for was the theme of April 11-12 ABET Symposium (sold out). Significant interest and visibility. Cyber criteria approved for 1st reading July 2018 and expected to be approved July 2019.
- ICCST is a “security” conference – so it’s very strong on “security” not necessarily cyber or related to AESS interests, and has few AESS involved, but does certainly include such and has tracks that are in interests of panel.
- DASC is an Avionics and Air Traffic Management conference – covering both air and space, so there is a Cyber track and a Cyber tutorial, but it does not constitute the majority of the conference.
- Success with special issue, but need for tutorial both in resource center and in magazine. Multiple efforts by several panelists to get these have not panned out.

Cyber Security – Future Directions Opportunities and Issues

- Committee Membership (7+10)
- Goal: Stronger, more effective panel
 - FD opportunities and issues
 - Kramer (Chair) - 16 others, including these 6 (2 BoG, 2 DASC TPCs, 2 ICCST chairs) and submitters to special issue from conference.
 - New member: Joe Dauncey - Chief Information Security Officer for the UK National Air Traffic Services
 - Membership is “open” – this allows interested members, particularly conference track and tutorial leaders in niche to be involved but also brings “volunteers” whose interest is self- and center- promotion and provides little organizing support.
 - Chairs of both DASC and ICCST are involved in the panel
 - Two of the members are DLs and third is chair of Avionics panel. They’re the 3 most involved with the Cyber panel. This is both a blessing and a curse as the Avionics panel is rebooted, given the pulls on all involved.

Cyber Security – Future Directions

Opportunities and Issues

- Meetings:
- Goal: Better distributed meetings. Plan to add a web meeting in June 2019.
 - [FD Opportunities and issues](#)
 - Both involved conferences are late in the year. This leads to overweighting of effort in September and October and little communication and opportunity for activities in first half of year.
 - Successful in having panel meetings at both conferences
 - Distribution over two conferences and lack of commitment from individuals to both the panel and the conferences means **members are not necessarily at either conference** and little/no overlap in meeting attendance.

Cyber Security Report (Technical Operations Panel) – From Fall 2018

- **Significant Accomplishments**
- “Cyber Security Engineering” Criteria have been approved by the ABET Engineering Accreditation Commission with panel chair (Kramer) on subcommittee from IEEE to work with INCOSE and CSAB. (provided)
 - Special Issue on Cyber Security in Aerospace Systems for SYSTEMS Magazine
 - Being proposed and promoted with E. Blasch. G. Thomas invited.
 - 2-part Special Issue November 2017 and March 2017 was a major/first accomplishment of panel. Thanks for Greco, Walsh, Thienissen. Drew from DASC and ICCST.
- **Objectives**
 - Two panel meetings per year incorporated into program of DASC and ICCST
 - Special Issue
 - Add to Resource Center and DLs
- **Notes**
 - Unique application of knowledge and effort (cyber security of aerospace systems) of wide-interest topic for aspects specific to our fields of interest.
 - AIAA started “Protocol” newsletter nominally on this, but it has NO information specifically related to aerospace systems.

Gyro and Accelerometer Panel -- Randall Curey

Specification Format Guide and Test Procedure for Linear Single-Axis, Nongyroscopic Accelerometers.” It was published February 25, 2019. A total of 62 individuals attended 30 bimonthly meetings of the Gyro and Accelerometer Panel during preparation of this revised standard. IEEE Std 1293 provides a specification format guide and a compilation of recommended test procedures for a linear, single-axis, nongyroscopic accelerometer for use in inertial navigation, guidance, and leveling systems. Informative annexes are given on the various types of such accelerometers (force or pendulous torque rebalance with analog or digital output, vibrating beam, and micromechanical) and error effects, on filtering, noise, and transient analysis techniques, and on calibration and modeling techniques (multipoint tumble analysis, vibration and shock test analyses, and geophysical effects in inertial instrument testing).

Now that the revision of IEEE Std 1293 is complete, the GAP is focusing on completing the development of IEEE Std 1780 “Standard for the Specification of Inertial Measurement Units (IMU).” This standard will provide guidelines for the preparation of an inertial measurement unit (IMU) specification document. This standard will allow each user to select which specifications are relevant to their particular application. The standard will use terminology which is commonly used by the inertial navigation community. If you are interested in participating in the development of IEEE Std 1780 or in any of the GAP activities, contact the panel Chair.

2019 Technical Operations

Navigation Systems Panel

Michael Braasch

Navigation Systems Panel

- Summary of recent activities – March 2019
- The Navigation Systems Panel (NSP) met via telcon on January 8, 2019. One of the major discussion points was the choice of track topics for the 2020 Position, Location and Navigation Symposium (PLANS 2020). The panel also discussed potential plenary session topics. The panel continues to seek out navigation engineers who should be nominated for elevation to Senior Member. Issues related to publishing in both conferences and journals were also discussed. The panel's next meeting will be held in Spring.

Navigation Systems Panel (NSP)

Current Status:

- AESS-organized track was held at PLANS 2018
- NSP member (Zak Kassas) is the Tech Chair for PLANS 2020
- Two members have been elevated to Senior Member
- Additional members outside of the U.S. have been recruited

Looking beyond PLANS:

- Discussing launching the 'IEEE Navigation Conference'
- Discussing the negative impact that IEEE's policy against double-publishing is having on PLANS [potential solution: Robotics and Automation – Letters and Conference Presentations]
- Seeking to be more active in recruiting high quality navigation papers both for TAES and SYSTEMS

Navigation Systems Panel (NSP)

Background:

- The Position, Location And Navigation Symposium (PLANS) was established in 1976 by the AESS BoG
- It became the premier IEEE positioning and navigation conference
- AESS support of PLANS waned in the late 1990s / early 2000s and by 2004 PLANS was on the verge of collapse
- The U.S. Institute of Navigation (ION) came to the rescue in 2006 and by 2016, AESS was only a technical co-sponsor
- With AESS' renewed/invigorated support of navigation, there is now a need for IEEE to reestablish a premier navigation conference

Navigation Systems Panel (NSP)

To better serve the worldwide IEEE navigation community:

- PLANS is biennial and always held in the US
- The NSP is discussing the launch of an 'off-year' navigation conference to be held exclusively outside the U.S.
 - “(the) **IEEE Navigation Conference**”
- Before finalizing this decision, need to engage with the existing IEEE-sponsored navigation-related conferences in Europe, Asia and Oceania
- The long-term goal is to make this the most prestigious navigation conference in the world

2019 Technical Operations

Radar Systems Panel

Shannon Blunt

Radar Systems Panel

The Radar Systems Panel is gearing up for the 2019 IEEE Radar Conference that will be held in Boston the week of April 22-26. As has become the norm for the flagship conference in the radar community, there will be an outstanding array of papers on cutting-edge research topics, running the gamut from novel radar components and architectures to new signal processing capabilities. With multiple tutorials available on both classical and emerging radar research areas, the conference is a great opportunity for those who are new to the field as well.

Future Directions

- Run the Student Paper Award at the Radar Conference as an RSP-level committee
 - The 2019 RadarConf in Boston will be the 1st time we employ the new process which involves empaneling judges at the RSP level instead of at the local organizer level. The purpose is to provide more consistency from year-to-year and greater transparency. This year will provide lessons learned to further improve the process.

- Establishing a “living” best practices for each RSP committee
 - Include why each best practice exists so that it can evolve with changing circumstances
 - First round is complete and we are now in the feedback stage (for this year)

- An ad hoc committee has been formed to perform due diligence investigation into the prospect of a new IEEE Transactions on Radar Technologies (exact title TBD)
 - Studying the pros/cons for both the radar community and the AES community as a whole, including the potential impact on Trans. AES
 - A proposal to the RSP is anticipated to be received by spring '19, for subsequent RSP discussion/vote before elevating to BoG level

Future Directions

- Establish stronger linkage between the Radar Conference series (and thus the RSP) and the AES journal(s) by making AES the go-to community for radar & spectrum sharing
 - One strategy is to establish a dedicated Transactions on Radar, to provide a natural path for expansion of Radar Conference papers (also facilitate continued growth of RadarConf)
 - Establish Spectrum Sharing (particularly if involving radar) as having its natural home in Trans. AES due to the inherent systems perspective and breadth over relevant technologies (radar, navigation, command/control comms, EW). A special section in T-AES will soon appear and in discussion with EiC to establish as a new topic area.

- Formalize the Radar Summer School that accompanies the Radar Conference
 - Having run successfully twice now (in '17 and '18) the summer school is being adopted as a permanent part of the Radar Conference and is organized by the RSP

Future Directions

- mm-wave / THz sensing and applications thereof
- expanding civil applications in automotive safety, wearables, and variety of autonomous vehicles
- software-defined radar capabilities
- Radar spectrum sharing (with 5G & beyond) and multi-function systems (RF convergence)
- continued expansion of waveform diversity capabilities and applications
- increasing decision autonomy in sensor systems (cognitive RF)
- quantum radar (though somewhat controversial)

Future Directions

- Electromagnetic spectrum maneuver
- integrated multi-modality systems (acoustics, optical, EO, IR, RF, etc.)
- Distributed/networked sensing
- “system-on-chip” radars
- Integration of passive and active sensing
- “extreme fidelity” systems (ultra-stable clocks, digitization at higher bandwidths, higher bit depths for dynamic range)
- Advances in metamaterials for dynamically reconfigurable operating modes

Space Systems Panel Topics

Cosimo Stallo

- Vision of the panel is to create a reference point for technical and scientific initiatives related to the space world. Panel members belong to (civil and military) institutions, industry and academia. The promotion and involvement of IEEE and AESS in space activities through the Panel is also aimed.
- In the frame of the Space Systems Panel, key topics related to space can be highlighted to the scientific and industrial community by the organization and development of the following:
 - Special Issues on Transactions and Journals
 - Conferences and Workshops
 - Editorial activities
 - Seminars, Courses
 - Books
 - Promotion and Standardization
 - Three Activities Areas:
 - Area 1 *Satellite Communications Systems*
 - Area 2 *Space Exploration and International Space Station*
 - Area 3 *Space-based Navigation Systems and Synthetic Aperture Radars*

Space Systems Panel

Near-Term Goals and Objectives

- Hold 2+ meetings/year
- Increase AESS reputation and visibility in space topics
- Relate to AESS Conferences, Meetings, Activities

AESS Activities

- Conferences – Aerospace Conference, MetroAerospace, with tracks related to panel are both fall.

Members

- Vice Chair Panel (Alfonso Farina (TBC))
- Others – high participation at Metro Aerospace Conference 2018

Journals and DLs:

Activities related to the role of Editor of Space Systems of the AES Transactions and for the Systems Magazine.
Foreseen 2 DLs in the space topics area.

Space Panel Report

- Activities related to the role of Editor of Space Systems of the AES Transactions and for the Systems Magazine.
- Organization of training and thesis activities of students at the University of Roma Tor Vergata in the field of space systems.
- Activities related to the co-chairing of Track 2 Space Missions, Systems and Architecture of the 2019 IEEE Aerospace Conference that will take place in Big Sky in March 2019.
- The 16th edition of the Master Course in “Advanced Satellite and Communications Systems” is in progress at the University of Rome Tor Vergata, while the 17th edition is in preparation.
- Activities related to projects, publications and teaching in the space system related topics.
- Development and publication of several papers about space systems in conference proceedings and journals.

2019 IEEE AESS UAS Tech Panel Plan

Vince Socci

Tech panel goals include:

- Hold student UAS workshop
- Remain active in UAS standards
- Publish UAS content within society publications
- Create short course relevant to UAS technology

UAS (cont'd)

- A recent UAS workshop was a flying success. It was held at Binghamton University on March 9, 2019. The workshop included 3 distinguished lectures on UAS technology, applications and policies. Attendees participated in UAS demos and hands-on flight activities. 120 people attended, including students, faculty., industry, government, and local community members.



