



# IEEE Aerospace Electronic Systems VP Technical Operations

*Michael Braasch*

*2022 AESS Spring Board of Governors Meeting*

*25-26 March 2022*

*New York, New York, USA*



- Michael Braasch
- Dale Blair
- Steve Butler
- Roberto Sabatini
- George Schmidt

▶ Technical Operations is responsible for oversight of the Technical Panels for the AESS Board of Governors.

- Currently we have six panels
  - Avionics Systems
  - Cyber Security
  - Glue Technologies for Space Systems
  - Gyro and Accelerometer (GAP)
  - Navigation Systems
  - Radar Systems

## ▶ Strengths

- Most of the panels are responsible for an important conference
- Most have contributed state-of-the-art articles to SYSTEMS
- Many articles submitted to TAES
- GAP has overseen the development and publication of more than a dozen standards

## ▶ Weaknesses

- Although all of the panels play a role, there is no panel specifically devoted to unmanned/autonomous systems

## ▶ Opportunities

- Supertopic: “Autonomy for Sustainability” Overseen by the Vision & Perspectives Committee (V&P) [POC from each panel]

## ▶ Threats

- Most of the people involved in the V&P Committee are extremely busy; difficult to get significant time to devote to the Supertopic

- ▶ **Supertopic: Autonomy for Sustainability**
  - The V&P committee met in mid-January and mid-February
  - Their immediate plan is to develop a detailed overview of the Supertopic and start drafting an article for SYSTEMS
  - I have asked them also to consider the following possibilities
    - Organizing special sessions at relevant conferences
    - Organizing regional workshops
    - Lectures/presentations at AESS chapter meetings

- ▶ Work with Conferences Committee
  - Coordinating special sessions, regional workshops
- ▶ Work with Industry Relations
  - Desirable to engage with relevant CTOs to ensure alignment with industry needs
- ▶ Other societies are working in the area of autonomy
  - ComSoc
  - Robotics and Automation Society
  - Vehicular Technology Society

- ▶ None
- ▶ V&P committee may need funds depending upon specific initiatives
- ▶ Regional workshops may need seed funds

# Reports from the Panels





# IEEE Aerospace Electronic Systems Avionics Systems Technical Operations Panel Report

*Roberto Sabatini*  
*Chair, Avionics Systems Panel*

*2022 AESS Spring Board of Governors Meeting*  
*25-26 March 2022*  
*New York, New York, USA*

# About the Avionics Systems Panel

The Avionics Systems Panel (ASP) is composed of IEEE Associate or higher level members who are representatives of industry, government laboratories, educational institutions and professional societies, and who are active in the domain of Avionics. Its main objectives are:

- Promote and support collaborative research initiatives in the domain of Avionics
- Develop and disseminate high-quality IEEE publications in the domain of Avionics
- Promote and support educational activities in the domain of Avionics
- Sustain and oversee the programs of the IEEE/AIAA Digital Avionics Systems Conference (DASC) and the Integrated CNS Conference; and contribute to other conferences and dissemination initiatives
- Manage the nomination and selection of candidates for IEEE Awards in the domain of Avionics
- Encourage submission of nominations for IEEE Fellows and Senior Members in the domain of Avionics
- Recommend and support new IEEE avionics standards or revisions of existing standards

- The ASP held monthly meetings (with participants from the US, EU, UK and Asia) addressing the following topics:
  - **Research and Innovation (R&I).** Participation to NASA UTM and AAM activities; connections/collaborations with NextGen in the US and SESAR in the EU; other national and international Avionics/ATM/UAS programs; Collaboration with JARUS, ICAO and IFATCA (UAS/UTM)
  - **Publications.** Editorial Committees and Reviewer contributions to the Transactions on Aerospace and Electronic Systems and AESS Systems Magazine; Special Issues on Avionics, UTM/UAM and Space Systems; joint journal publication initiatives (e.g., Avionics Systems for Trusted Autonomy, Multi-Domain Traffic Management, Avionics Education)
  - **Conferences.** IEEE/AIAA Digital Avionics Systems Conference (DASC); IEEE/AIAA Integrated Communications, Navigation and Surveillance Systems (ICNS) Conference; IEEE/AIAA/PHM Aerospace Conference; other conferences
  - **Education Activities.** AESS Distinguished Lecturers/VDL Program updates; Webinars, Tutorials and Short Course initiatives
  - **Avionics Standards.** UAS/autonomy, AI, V2X Communications, Cyber Security, etc.
  - **Joint Technical Panel activities.** Vision/Synergy and Cyber Security Panel Liaison

- The ASP is collaborating with ICAO, IFATCA, EASA, EUROCAE and SESAR initiatives to promote avionics research/innovation, education and the evolution of certification standards for UAS Traffic Management and Advanced Air Mobility
- ASP members contributed to weekly meetings of the JARUS (Joint Authorities for Rulemaking on Unmanned Systems) Working Group 7 – Automation Concept of Operations, with contributions focusing on:
  - Flight Rules for Autonomous Operations
  - ATM and UTM Automation
  - Infrastructure, Aerodromes and Ground Equipment
  - Considerations for Technology Maturity
  - Automation and Trusted Autonomy Use Cases
  - Multiple Simultaneous Operations

- The ASP expanded the international engagement with multiple professional/scientific bodies and institutions and delivered the following invited Seminars, Keynotes and Lectures:
  - “Automation in Multi-Domain Traffic Management.” Research Seminar delivered at the Joint Authorities for Rulemaking in Unmanned Systems (JARUS) Working Group 7 - Automation Concept of Operations. February 2022
  - “GNSS Performance Monitoring and Augmentation for Trusted Autonomous UAS Operations.” Keynote paper presented at the 2021 Annual Seminar of Spatial Geodesy Study Group (GEGE) & III INCT GNSS-NavAer Workshop (GNSS Technology in Support of Air Navigation). Sao Paulo (Brazil), December 2021
  - “Digital Transformation and Sustainability of the Air and Space Transport Sector.” Keynote paper presented at the 2021 International Symposium on Sustainable Aviation (ISSA 2021). Bangkok (Thailand), November 2021
  - “Trusted Autonomy in UAS Traffic Management.” Research Seminar delivered at the Joint Authorities for Rulemaking in Unmanned Systems (JARUS) Working Group 7 - Automation Concept of Operations. Nov 2021

- The Avionics Conference Committee actively supported the organization and management of the DASC, ICNS and Aerospace Conferences. ASP members assisted with local arrangements/planning, conference tutorials and session leadership roles
- DASC 2021 hosted a UAS students' competition organized by the ASP. Various Universities and STEM High Schools have participated
- The ASP developed and delivered a free-of-charge tutorial at DASC 2021, focusing on the following panel activities:
  - **Avionics Research and Innovation Perspectives**, portraying the ASP vision on avionics systems future evolutions, with an identification of key research challenges and industry-focused innovation opportunities
  - **Avionics Education Perspectives**, providing guidelines for university curricular updates both at an undergraduate and post-graduate level
- One of the candidatures submitted by the ASP was selected for the IEEE AESS Early Career Award, which was formally conferred at DASC 2021

- Leading two AESS “Systems” Special Issues, expected to be completed in 2022:
  - **UAS Traffic Management and Urban Air Mobility**, focusing on low-level ATM and U-Space
  - **Space Domain Systems**, focusing on Space Domain Awareness and Space Traffic Management
- Currently contributing to high-impact editorial initiatives, including: IEEE Press Series: **Progress in Aeronautics and Astronautics Systems**, Series Co-Editor Prof. Rob Sabatini
- Various ASP members served as Distinguished Lecturers (DL) and also contributed to the Virtual DL (VDL) Webinar Series. Since last meeting, the following VDL was delivered:
  - R. Sabatini, “**The Future of Air and Space Transport – Towards Multi-Domain Traffic Management.**”  
November 2021

Various additional DL/VDL and Tutorials are planned for 2022/23

- A new ASP tutorial is being prepared for DASC 2022, focusing on **AI/ML in Avionics Systems vis-a-vis Certification Requirements**



# IEEE Aerospace Electronic Systems Cyber Security Technical Operations Panel Report

*Kathleen Kramer  
Chair, Cyber TechOps Panel*

*2022 AESS Spring Board of Governors Meeting  
25-26 March 2022  
New York, New York, USA*



The AESS Cyber Security panel supports cyber security technical activities, including conference activities and events, publications, and educational activities that promote developments, awareness and understanding of cyber security applications and issues in complex systems for space, air, ocean, or ground environments, and particularly those that apply to aviation and aerospace. These technical areas include:

- Cyber security for aircraft and avionics
- Secure navigation and GPS threats
- Cyber security for aviation and other transportation systems
- Information security for complex systems
- Identification and modeling of cyber-related vulnerabilities

## Panel Meetings

- Establishing regular panel meetings, using Avionics Systems Panel's monthly timeslot, alternative months, beginning in April 2022

*Additional new activities: What can we do with the "new" Cyber Panel or the Carnahan Conference in terms of a "summer school" or a technical challenge for these critical AESS areas? [Laila, Mark]*

## Distinguished Lectures

## Conference Activities

- IEEE Education Week – Future Directions on LEO SatS (Security Issues)
- 2022 Digital Avionics Systems Conference (September 2022 - Portsmouth)
  - Track on Cyber Security and Systems (Kramer is chair of track)
  - Pre-Conference Tutorial offered by Avionics Systems Panel
  - This elaborates and enhances 2021 activities.
- 2022 IEEE International Carnahan Conference on Security Technology (September 2022 - Třebíč, Czech Republic)
  - Tech Ops Panel Meeting at conference
- *SSS – originally planned for 2020 fall - not sure current status*

- Panel meetings and tracks at DASC and Carnahan, including papers and tutorial with ASP.
- IEEE Future Directions LEO Satellite Systems Workshop (November 2021) - Low Earth Orbit (LEO) Satellites and Systems (LEO SatS) virtual workshop exploring opportunities of significant impact in this area. Panel presentation “Security Challenges for LEO Satellite Communications ” by K. one of four featured LEO topics re-recorded on IEEE.TV as part of compilation for IEEE Future Directions. Currently be promoted for Education Week (April 2022).
- Participated in the AESS virtual webinars with panel related topics, including two in the Fall 2021 series (“Feature Object Extraction – Fusing Evidence, Not Rolling the Die” by Kathleen Kramer, “The Future of Air and Space Transport – Towards Multi-Domain Traffic Management” by Roberto Sabatini).

- Panelist Joe Dauncey chaired the AESS Tech Ops VP Committee on Vision and Perspectives.
- 2021 Digital Avionics Systems Conference: Conference Tutorials
  - “Introduction to Aviation Cyber Security” by Krishna Sampigethaya
  - Autonomy and Security II - Machine Learning in Avionics” by Pavel Paces
  - And an effort led by the AESS Avionics systems panel, featuring speakers from the Cyber Security Panel, “AESS Avionics Systems Panel Research and Education Perspectives” by R. Sabatini, I. Majid, E. Blasch, G. Fasano, K. Kramer
- 2021 ICCST (Carnahan Conference) – October 2021 (Virtual)
  - Panel meeting held at each Carnahan, organized by panelists Gordon Thomas and William Claycomb
- 1st Workshop on Secure and Reliable Communication and Navigation in the Aerospace Domain (SRCNAS) – September 2021 (Virtual)
  - Panelist contributed to organization of this workshop within the 6th IEEE European Symposium on Security and Privacy  
<http://www.ieee-security.org/TC/EuroSP2021/>



# IEEE Aerospace Electronic Systems Gyro and Accelerometer Panel (GAP)

*Randall Curey*  
*Chair, GAP*

*2022 AESSE Spring Board of Governors Meeting*  
*25-26 March 2022*  
*New York, New York, USA*

- Promulgate the understanding of components and systems for detection or measurement of linear or angular motion
- Develop inertial standards with industry consensus
  - Specification format guides
  - Test procedures
  - Terminology
  - Recommended practices
- Provide periodic revision of the standards developed by the GAP
  - 14 published standards
  - One under development (with editor)

The panel established the following objectives at the meeting that was held on January 17/18, 2022:

- Get panel policies and procedures approved
- Get working group policies and procedures approved
- Work with editors to publish 1780 by March
- Re-ballot and work with editors to publish 1559 revision by end of year
- Complete draft of 1431 revision by the end of the year
- Create INS draft outline by end of the year

Where,

1780 is “Standard for Specifying Inertial Measurement Units (IMUs).” This is the standard that is in the process of being published.

1559 is “Standard for Inertial Systems Terminology.” One of the 14 standards the GAP maintains.

1431 is “Standard for Specifying and Testing Coriolis Vibratory Gyros.” One of the 14 standards the GAP maintains.

- The GAP held 2 meetings since November 2021

Dates	Location	Host	Attendance
Nov 15-16, 2021	Virtual	Webex	12
Jan 17-18, 2022	Virtual	Webex	16

- Future GAP meetings

Dates	Location	Host
March 7/8, 2022	Virtual	Webex
May 2/3, 2022	Virtual	Webex
July 11/12, 2022	Virtual	Webex



- Revision of 1431, “Standard for Specifying and Testing Coriolis Vibratory Gyros”
  - The GAP continues to revise this standard
- Revision of 1559, “Standard for Inertial Systems Terminology”
  - Resolved comments from first recirculation ballot
  - Second recirculation ballot is complete and comments have been received
  - Comments from second recirculation ballot will begin to be resolved at the March GAP meeting
- Publication of 1780, “Standard for Specifying Inertial Measurement Units (IMUs)”
  - Has been approved by Nescom
  - Has been sent to the editors
  - Awaiting first proof from editor
- INS draft outline
  - Brainstormed elements of an Inertial Navigation System (INS)
  - Started organizing these elements into an outline



# IEEE Aerospace Electronic Systems Glue Technologies for Space Systems (GlueTech)

*Claudio Sacchi  
Chair, GlueTech*

*2022 AESS Spring Board of Governors Meeting  
25-26 March 2022  
New York, New York, USA*

- Promote the coordination of the technical activities related to the technologies that constitute the necessary common platform for innovative Space Systems;
- Promote and support publications concerning the panel topics;
- Organize panels and special sessions in featured-topic conferences;
- Promote educational activities;
- Encourage the submission of nominations for IEEE Fellows and Senior Members in the fields of interest of the panel;
- Manage the nomination and selection of candidates for IEEE Awards in the fields of interest of the panel;
- Creation of communities and forums cooperating in the development of panel technical activities.

- Panel awarded by AESS as:

*2021 AESS Technical Panel of the Year*



- Some papers have been published with the acknowledgment to the GlueTech panel on IEEE international conferences, IEEE journals and other valued international journals in the period Oct. 2021/Mar. 2022. Here they comes the titles:
  - A. Guidotti, C. Sacchi and A. Vanelli-Coralli, "Feeder Link Precoding for Future Broadcasting Services: Architecture and Performance," in **IEEE Transactions on Aerospace and Electronic Systems**, doi: 10.1109/TAES.2022.3144243 (published in early view mode).
  - S. Bonafini, C. Sacchi, R. Bassoli, F. Granelli, K. Kondepu, F.H.P. Fitzek, "3D Cloud-RAN Functional Split to Provide 6G Connectivity on Mars", **IEEE Aerospace Conference 2022**, Big Sky (MT), 5-12 March 2022, pp. 1-12.
  - R. Puddu, V. Popescu, M. Murrone, "An Open-Source Simulator for Next Generation Satellite Broadband Traffic Management", **IEEE Aerospace Conference 2022**, Big Sky (MT), 5-12 March 2022, pp. 1-7.

- Two papers have been submitted during the period Sept 2021/March 2022:
  - S. Bonafini, C. Sacchi, R. Bassoli, F. Granelli, K. Kondepu, F.H.P. Fitzek, “An Analytical Study on Functional Split in Martian 3D Networks,” **IEEE Transactions on Aerospace and Electronic Systems**, submitted on Sept. 27, 2021, revised on Feb. 26, 2022, now under review.
  - S. Bonafini, C. Sacchi, R. Bassoli, F. Granelli, K. Kondepu, F.H.P. Fitzek, “End-to-End Performance Assessment of a 3D Network for 6G Connectivity on Mars Surface”, **Computer Networks**, submitted on March 17, 2022.
- A special section of **IEEE Transactions on Aerospace and Electronic Systems** has been organized about the panel topics. Title: *Information and Communication Technologies (ICT) for a New Space Vision* (organizers: C. Sacchi, F. Granelli, M. Marchese, K-M. Cheung, M. Noble).
- **16 papers have been submitted and reviewed.** The first review round has been concluded. The second review round has begun on early March 2022.

- The proposal for the edited book: **“A Roadmap to Future Space Connectivity”** has been submitted to Springer in December 2021 and accepted in January 2022.
- The Book editors are Claudio Sacchi (panel chair), Fabrizio Granelli (panel founder member), Riccardo Bassoli (panel secretary), Frank Fitzek, Marina Ruggieri (panel founder member).
- An email with detailed instructions for the submission of the contributions will be sent soon to the authors by the corresponding editor Riccardo Bassoli.
- **14 contributions** have been planned and listed in the proposal. Other (few) contributions might also be included on the way.

- **The Special Session 4.03 of IEEE Aerospace Conference 2022**, dealing with the «Glue Tech» topics received 4 paper submissions. Three of these papers have been orally presented at the conference, while one of these has been presented in EPH modality.
- A liaison with **IEEE MetroAeroSpace Workshop** has been established. Such a liaison has been concretized, for what concerns the 2022 edition, in the organization of a special session titled: «*Interplanetary Exploration: Mars and Moon*» (organizers: Claudio Sacchi and Cosimo Stallo). The workshop will be held in Pisa from June 27 to June 29, 2022.
- **The Spring panel meeting has been held on March 11, 2022**, during the IEEE Aerospace Conference, in the premises of Yellowstone Conference Center of Big Sky (MT). The meeting has been in presence, with remote Zoom connection for panel members not present in Big Sky.
- Next panel meeting will be held in **September 2022** (date, modality and location to be defined, hopefully in presence).



- **PhD Summer School 2022**

- During the last meeting on March 10, 2022, it has been decided by the panel members to launch, for the second consecutive year, the **Summer PhD School** dealing with the panel topics.
- The panel aims at achieving again the sponsorship of AESS and Italian Space Agency (ASI).
- A proposal completed with the School contents and location will be prepared soon. There has been an agreement to hold the school in presence, with Zoom or MS Teams connection available for those students that will prefer to attend the lectures in remote.
- The period chosen for the School is the week from 5 to 9 September.

- **Authors for the annual panel paper**

- We indicate as authors for the annual panel paper the panel founding members, i.e.:
  - Claudio Sacchi (University of Trento, Italy)
  - Marina Ruggieri (University of Rome «Tor Vergata», Italy)
  - Kar-Ming Cheung (Jet Propulsion Lab, Pasadena, CA);
  - Mario Marchese (University of Genoa, Italy), IEEE Senior member, ComSoc member;
  - Fabrizio Granelli (University of Trento, Italy), IEEE Senior member, ComSoc member;
  - Vlad Popescu (University of Transilvania, Brasov, Romania), IEEE member, BTS member;
  - Michael Rice (Brigham Young University, Provo, UT), Fellow IEEE, AESS member;
  - Maurizio Murrone (University of Cagliari, Italy), IEEE Senior member, BTS member;
  - Nicola Conci (University of Trento, Italy), IEEE member, SPS member;
  - Christian Schlegel (HCDC llc, Park City, UT, Acoubit Communications, Halifax, NS, Canada), IEEE Fellow;
  - Tommaso Rossi (University of Rome “Tor Vergata”, Italy);
  - Michael Noble (L3 Technologies, New York, NJ), IEEE AESS, GRSS, APS, and Photonics Society member.



# IEEE Aerospace Electronic Systems Radar Systems Panel (RSP)

*Nathan Goodman*  
*Chair, RSP*

*2022 AESSE Spring Board of Governors Meeting*  
*25-26 March 2022*  
*New York, New York, USA*

- Sustain and oversee the program of IEEE Radar Conference series
- Promote and support publications in the field of Radar
- Promote educational activities in the field of Radar
- Provide periodic revision of IEEE Standards pertaining to the domain of Radar
- Encourage the submission of nominations for IEEE Fellows and Senior Members in the field of Radar
- Manage the nomination and selection of candidates for IEEE Awards in the field of Radar

- 2022 IEEE Radar Conference Update

- March 21-25 in NYC
- Mixture of in-person traditional presentations with author-uploaded recordings
- Conference Catalysts supporting conference, yet hybrid format has required a lot of additional coordination from volunteer organizing committee – heavy commitment from organizing committee
- Covid-related restrictions have relaxed in NYC just in time for conference
- Hybrid and in-person registration fees are the same
  
- 71 Student Papers submitted to the student paper competition
- Room-night requirement renegotiated to 635 and met on last day the conference rate was available
- Strong showing from corporate financial supporters and exhibitors has been essential to conference financial viability
- Over 500 paid registrations and over 80 Radar Summer School Registrations

- Other Future Conferences
  - 2023 IEEE Radar Conference: May 1-5, 2022 in San Antonio
  - 2024 IEEE Radar Conference: TBD
    - We have a committee interested in organizing, but still collecting data and selecting a location
    - Have looked at several possibilities (Chicago, Denver, ...)
  - 2025 IEEE International Radar Conference: Atlanta, GA (rescheduled with hotel in agreement to hold 2021 IEEE Radar Conference as virtual)
- We have had challenges getting information from organizers for the 2021 CIE International Conference on Radar (China) and 2022 International Radar Conference (UK)
  - AESS is technical co-sponsor on these and we typically receive planning updates

- 2022 RSP-Administered Awards:
  - 2022 Warren D. White Award for Excellence in Radar Engineering
    - **Fulvio Gini**  
*“For contributions to Radar Signal Processing and Radar Clutter Modeling and Analysis”*
  - 2022 Fred Nathanson Memorial Radar Award
    - **Augusto Aubry**  
*“For outstanding contributions to the application of modern optimization theory to radar waveform design and adaptive signal processing”*
- 2022 IEEE-Administered (RSP-related):
  - 2022 IEEE Dennis Picard Medal for Radar Technologies and Applications
    - **Moeness Amin**  
*“For contributions to radar signal processing across a wide range of applications including through-the-wall imaging and health monitoring.”*

- Other Updates & Activities

- March 22, 2022: First in-person RSP meeting in ~3 years held at IEEE Radar Conference in NYC. Approx. 75% in-person attendance with other joining virtually
- New journal: Transactions on Radar Systems working its way through approval process
- But also working to grow radar-related submissions to T-AES...
- Continue to emphasize and broaden participation in civilian radar applications, for example:
  - Upcoming T-AES special sections on “Automotive Imaging and Super-Resolution Radar Systems” & “Deep Learning for Radar Applications”
  - Special session on Automotive Radar Systems at 2022 IEEE Radar Conference
- Good RSP representation on IEEE’s new Synthetic Aperture Standards Committee
- RSP Standards and Spectrum Innovation Committees working to include radar perspective into spectrum sharing updates to IEEE standards





# IEEE Aerospace Electronic Systems Navigation Systems Panel

*Michael Braasch*  
*Chair, NSP*

*2022 AESS Spring Board of Governors Meeting*  
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- Primary panel responsibility is support of the PLANS conference
- U.S. Institute of Navigation (financial sponsor of PLANS) moved the next offering from 2022 to 2023 due to issues related to the pandemic
- Proposal for a Special Section in TAES has been submitted and has gone through a couple of rounds of revisions so far
- NSP has organized a special session on navigation at this year's FUSION conference



# IEEE Aerospace Electronic Systems Ad Hoc Visions and Perspectives Committee

*Joe Dauncey  
Chair, V&P*

*2022 AESSE Spring Board of Governors Meeting  
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# Autonomy for Sustainability

IEEE AESS Supertopic Definition  
February 2022

# Development Activities

This deck can be provided to colleagues to spread the word

Options:

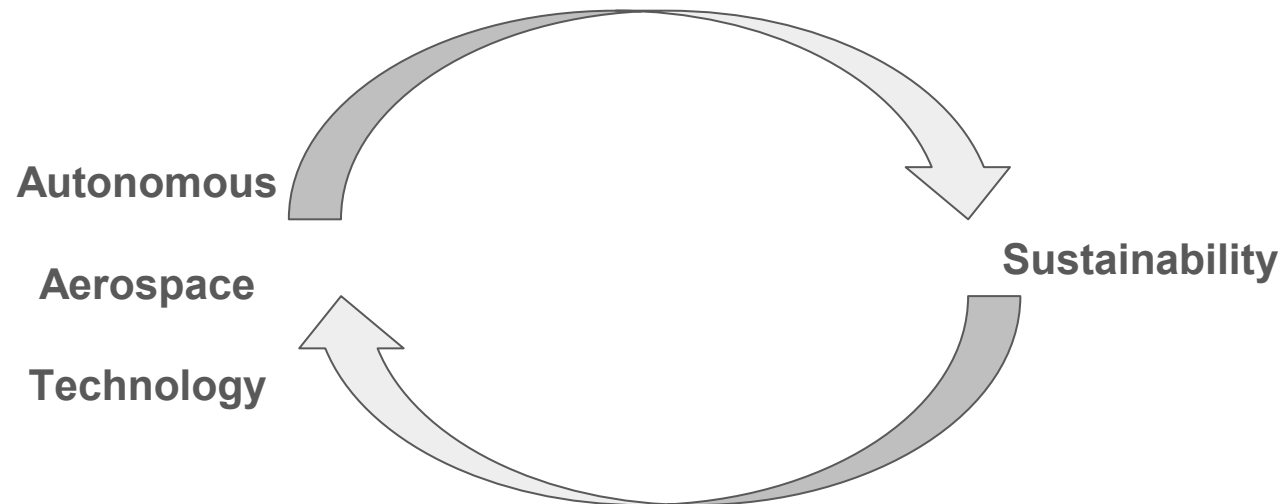
- Graphic enhancement of deck
- Animated version with voiceover
- Word Cloud
- Minecraft world (joking!)

# Autonomy for Sustainability

Reflect current technological evolution while also giving a perspective aimed at global benefit (for humanity and Earth):

- **Autonomy** : Enables humanity to maximise their potential
- **Sustainability** : Ensures that what is done is in the interests of global society

Where autonomy is implemented by technology, sustainability gives it a moral/ethical context



# Autonomy for Sustainability

Autonomous systems are becoming mainstream in many walks of life:

- Unmanned Aerial Vehicles, Self-driving cars, Robotic surgery, Electronic Home-assistants, Manufacturing and warehouse systems, Space Systems and Surveillance
- Humanity faces the challenge of increased interaction with autonomous systems in everyday life
- AESS covers many of the areas where these impact will be felt
- Autonomous systems also has the potential to be used for very nefarious efforts
- establishes a role for the AESS in steering autonomous technology for the betterment of society and the planet
- Autonomy enables empowerment of the human in their society/context
- Aligns with IEEE Vision - Technology for Humanity

# Autonomy for **Sustainability**

Sustainability ensures that all the great things we have created as human beings remain great for future generations:

- The immediate crisis of climate change is a threat to sustainability
- Further, technology itself poses some threat if used for the wrong purposes
- Sustainability is key to engagement with younger generations
  - Keen to apply their ethical/moral beliefs to the problems that they are trying to address
  - Averse to application of their professional/technical disciplines in isolation to the perceived challenges in global society
- Sustainability challenges are becoming more clearly understood, and it is essential for all innovation to make consideration
- Autonomous systems are expected to affect global productivity, equality and inclusion, environmental outcomes, both in the short and long term
- Demonstrates the AESS role in exploring the broader societal impacts of technology



# Supertopic Benefits

A topic on which all Panels can converge

Not only a technical topic:

- Tangible societal benefits
- Significant regulatory aspects that are needed to ensure trusted autonomy
- Regulatory and standards gaps
- Ethical aspects on the boundaries of autonomy and the role of humanity

Demonstrates AESS leadership by mapping societal problems to technological developments

Shows that technology/engineering does not exist in a silo

Challenges members on the application of their disciplines in their day-to-day working lives

Enables members (especially younger/emerging members?) to apply their disciplines in ways that support their beliefs (where those beliefs align to improved sustainability)

Ensures that panels and research agendas are scoped to consider the implications that are needed to make the work relevant to society

Enables opportunities for partnerships

**Fundamentally, for the AESS, it keeps what has always been good and demonstrates why it is relevant today**