

CALL FOR PAPERS

IST-166 Specialists' Meeting

on

MISSION ASSURANCE for AUTONOMOUS UNMANNED SYSTEMS

to be held at

The Military Academy Research Center (CINAMIL)
Campus Amadora
Amadora, Lisbon, Portugal

16 – 17 OCTOBER 2018



DEADLINE FOR RECEIPT OF EXTENDED ABSTRACTS

29 JUNE 2018

(US Authors please check Attachment 1 of this document)

This Specialists' Meeting is unclassified and open to NATO nations, Partner for Peace nations, Mediterranean Dialogue, ICI nations and Global Partners

You can also find this Call for Papers on our events website: <https://events.sto.nato.int>

IST-166 Specialists' Meeting

The NATO Science and Technology Board recognizes the ever-increasing importance of unmanned autonomous systems for security and defense applications. These systems will enhance situational awareness by providing unprecedented sensing capabilities, information extraction, and precision actuation. As autonomous unmanned systems evolve, new problems in cyber security will emerge that are difficult to attack with conventional methods. The problems will require new techniques that are more adaptable and flexible to provide system and mission resiliency.

This Specialists Meeting will provide attendees a forum to discuss state-of-the-art and emerging disruptive technologies, developments, concepts and operational solutions to ensure the mission of unmanned and autonomous systems of the future. The combination of specialists from various technical and non-technical domains in NATO allows a universal and unbiased discussion.

The **NATO Science and Technology Board extends a special welcome to those with tactical experience with unmanned systems.** Our goal is to join the user community with the researchers to develop a common road map for future research activities in NATO.

THEME

Advances in autonomous unmanned systems provide an increasing number of challenges for both the operational and research communities. Careful consideration is needed in the command and control of the integrated man and machine team when considering the communication systems and the dependencies across the distributed and complex operational environments. The traditional understanding of cyber network operations will extend beyond the physical connectivity into the electromagnetic spectrum. There will be an increasing number of access points for nefarious actors to corrupt collection integrity, inject false data or modify data with the intent to deceive or deny the mission. Trends in the commercial sector will spill over into the defense systems and we will rely more heavily on infrastructure as a service and security as a service as cyber reach continues to extend from wired systems to systems connected through wireless communications.

This growing complexity makes it even more pressing to develop a holistic approach to security to ensure that adequate protection is integrated in the development of new capabilities from the early design stages. Experts need to be involved to help security researchers understand the breadth and depth of new security risks. Novel security solutions will ensure the success of the future integration of man and machine across sea, land, air and space systems.

This specialist meeting will focus on the multi-disciplinary aspect of the problem of providing mission assurance for autonomous unmanned systems. Understanding the role and the potential of unmanned autonomous systems in future missions is critical to identify new cyber security risks and develop novel methods to address them. A non-exhaustive list of suggested topics is presented below.

TOPICS

Mission concepts integrating unmanned and autonomous systems

- Scenarios for current and future applications of unmanned and autonomous systems
- Mission planning and execution with increased levels of autonomy
- Modeling, simulation, and emulation of unmanned and autonomous systems
- Advances in man-machine interfaces and enabling technologies
- Training in the human-machine work force

Unmanned and autonomous system platforms

- Taxonomies and characterizations of unmanned and autonomous system platforms
- System, data architectures, and embedded system process control
- New concepts and development in unmanned and autonomous system vehicles
- Interoperability among unmanned and autonomous system vehicles

Risk management and risk assessment for autonomous systems

- Vulnerability and risk assessment tools for unmanned and autonomous systems
- Security and advanced threat assessment of unmanned and autonomous systems
- New challenges in risk management of autonomous cyber-physical systems

Validation and verification for autonomous vehicles and software

- Validation and verification of artificial and computational intelligence for autonomy
- Ensuring trustworthiness of sensor data
- Security assurance in embedded systems and systems with commercial components
- Secure and efficient implementation of crypto mechanisms
- Extended reach with cyber operations and compromised systems

Enabling technology for autonomy

- Blockchain architectures for distributed systems and logistics chain management
- Autonomous agent novel learning methods and algorithms
- Secure and robust machine learning
- Tamper protection
- Cryptography for distributed autonomous systems in heterogeneous environments
- State of health assessment of autonomous systems

The Specialists Meeting will provide a forum to identify and gain input on and resolution of issues associated with NATO Policy, provide overviews of current research activities.

It is desired that the experts create ideas and concepts for panel-overarching research activities (→ TAPs).

It is anticipated that the event will also pursue Keynote Addresses from the Host Nation and NATO representatives as well as Invited Papers.

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INTRODUCTION

The Specialists' Meeting will be held in **Lisbon, Portugal from 16 to 17 October 2018**. All sessions will be **Unclassified/Unlimited**. The event is open to NATO nations, PfP nations, Global Partners and Invited Contact Countries. Attendance at STO meetings is by request only.

Authors are invited to submit papers for this event according but not limited to the list of relevant topics given in this Call for Papers.

The selection of papers will be completed very swiftly and authors notified by early July. Authors of selected papers will be provided with information in the Instructions for Authors document, which contains detailed instructions for the presentation, transmission, etc. of papers.

The time allowed for each speaker is normally 30 minutes, including 10 minutes for discussion. Equipment will be available for PowerPoint presentations. Paper presentation times will be given in the Programme Announcement sent to all authors by the IST Panel Office.

IMPORTANT

Authors of selected papers are to provide to CSO their complete manuscript (PdF file) and the source document (MS Word, etc.) by email 30 days prior to the event, as well as the Publication Clearance Certificate (Form 13). Cleared papers, when available, will be put on the STO website prior to the event, under the "Pre-Released" section of the "Reports" pages and will remain as such until officially published.

Note: The proceedings will be Unclassified/Unlimited.

ABSTRACTS

Unclassified abstracts of papers offered for the Specialists' Meeting should be submitted in the following format:

**IST-166 Specialists' Meeting
Mission Assurance for Autonomous Unmanned Systems**

TITLE OF ABSTRACT/PAPER

Title/Rank, Full Name of Author/Co-Author(s)

LENGTH	- 2-5 pages extended abstract
CONTENT	- Introduction/relevance to the Symposium
	- Rationale
	- Description of methods employed and results obtained
	- Conclusions

Authors' and Co-Authors' names, complete mailing addresses and emails must be included with the abstract.

Abstracts should be submitted by email to the Co-Chairmen (mkb333@gmail.com; Federico.mancini@ffi.no) with a courtesy copy to the IST Panel Assistant (aysegul.apaydin@cs0.nato.int) no later than **29 June 2018** for subsequent transmission to the Programme Committee Members. This date is important and must be met in order to ensure consideration.

The abstract must also contain a declaration from the author(s) that there are no restrictions regarding presentation neither during the event nor of the publication of the paper (as described in the abstract) in the Meeting Proceedings.

CLEARANCE OF PAPERS/ABSTRACTS

It is the responsibility of each contributor to fulfil the publication release requirements of his/her organisation/company and country and to obtain the mandatory clearance of abstracts, papers and presentations. Authors will be requested to fill in a "Presentation/Publication Release and Clearance Certificate Form 13" to give the STO the right to publish their paper in the Meeting Proceedings.

INSTRUCTIONS FOR U.S. ABSTRACTS

U.S. abstracts, even though they are unclassified should be submitted by **29 June 2018** to the U.S. PoC ONLY. (U.S. authors should refer to Attachment 1 for more details).

In addition US abstracts must include:

- CONTENT - Your abstract should fully represent your contribution and be free of publication restrictions
- IDENTIFICATION - Information on Attachment 1 must be provided with all abstracts
- SUBMITTAL - By all authors
- CLASSIFICATION - **Abstracts must be Unclassified**

PRELIMINARY SCHEDULE		
29 June 2018	All Abstracts due	Submission deadline for US Abstracts to be sent to U.S. National Coordinator (see Attachment 1)
16 July 2018	Abstract Rejection/Acceptance Notification	
23 July 2018	Authors of Accepted Papers receive the Instructions for Authors	
1 August 2018	On-line registration opens; Authors receive notice	
1 September 2018	Full Paper and Clearance Form 13	
1 October 2018	PowerPoint presentations due	

Any questions on the technical aspects of the scientific programme should be addressed to the Co-Chairs. Questions on the administrative aspects of this event and requests for further information on STO activities should be addressed to the IST Panel Assistant, Mrs Aysegül Apaydin (aysegul.apaydin@cs0.nato.int).

NOTE

Authors of papers selected for presentation at NATO/STO events are not financially supported by this organisation.

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GENERAL INFORMATION

Participation and Enrolment

You can attend and participate in the meeting even if you do not present a paper. Whether you present a paper or not, it is mandatory for all individuals to enrol online on the link mentioned below. The link is <https://events.sto.nato.int>. The enrolment process will be open beginning August 2018.

Here are the steps you will need to follow in order to use the new enrolment system:

1. Click on link: <https://events.sto.nato.int/>
2. Create an account (as it is a new system, you need to register once. Under "Login", click on "Create an account")
3. Fill in all the fields
4. Activate the account via the link you will receive by mail
5. Go to "Event Summary" and login
6. Go to IST-166 Specialists Meeting and click on it
7. Once you're in the page, you will also be able to download Meeting Announcement as well as the General Information Package (GIP)
8. Mandatory: Click on "Book now"
9. Check boxes and click on "Next"
10. Fill in the Captcha
11. Click "Book"
12. You will receive a notification saying booking was successful together with the booking confirmation
13. You will receive a second mail when your STO National Coordinator or the IST Panel Office validates the booking.
14. Go back to your booking and retrieve the General Information Package.

Thank you for your contributions which are most appreciated by all the NATO community.

SPECIAL NOTICE TO U.S. AUTHORS
AND
NON-U.S. CITIZENS AFFILIATED WITH U.S. ORGANISATIONS

(Ref.: Specialists' Meeting IST-166) on "MISSION ASSURANCE for AUTONOMOUS UNMANNED SYSTEMS" to be held in Lisbon, Portugal.

ABSTRACTS OF PAPERS and/or full PAPERS FROM THE U.S. MUST BE SENT ONLY TO THE FOLLOWING P.O.C.

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ALL U.S. AUTHORS MUST SUBMIT ONE ELECTRONIC COPY OF ABSTRACTS TO THIS P.O.C. BY **29th JUNE**

IN ADDITION TO THEIR ABSTRACT, ALL U.S. AUTHORS MUST PROVIDE:

- (A) A CERTIFICATION (CAN BE SIGNED BY THE AUTHOR) THAT THERE ARE NO PROPRIETARY OR COPYRIGHT LIMITATIONS
- (B) INTERNAL DOCUMENTATION FROM THEIR LOCAL PUBLIC AFFAIRS OR FOREIGN DISCLOSURE OFFICE (OR EQUIVALENT) THAT CLEARLY SHOWS:
 - TITLE OF THE PAPER OR PRESENTATION
 - LEVEL OF CLEARANCE (I.E. APPROVED FOR PUBLIC RELEASE)
 - NAME, TITLE AND ORGANIZATION OF THE APPROVAL AUTHORITY
- (C) FULL DETAILS OF AUTHORS

NOTE THAT ONLY COMPLETE PACKAGES (ABSTRACTS + ITEMS LISTED ABOVE) WILL BE ACCEPTED BY THE U.S. P.O.C.

AFTER REVIEW AND APPROVAL, THE U.S. P.O.C. WILL FORWARD ALL U.S. ABSTRACTS TO THE IST PANEL OFFICE, WHO WILL SEND THEM TO THE PROGRAMME COMMITTEE.

U.S. AUTHORS ARE ENCOURAGED TO ADDRESS QUESTIONS AND CONCERNS TO THE P.O.C. AS EARLY AS POSSIBLE.

DELAYS IN MEETING DEADLINES WILL IMPACT THE TIMELY SUBMISSION OF YOUR ABSTRACT.