Research Group on Issues of Autonomy and AI for Defense Systems

Industry Connections Activity Initiation Document (ICAID)

Version: 1.0, 9 June 2021

IC21-006-001 Approved by the IESS SMDC 14 June 2021

Instructions

- Instructions on how to fill out this form are shown in red. It is recommended to leave the instructions in the final document and simply add the requested information where indicated.
- Shaded Text indicates a placeholder that should be replaced with information specific to this ICAID, and the shading removed.
- Completed forms, in Word format, or any questions should be sent to the IEEE Standards Association (IEEE SA) Industry Connections Committee (ICCom) Administrator at the following address: industryconnections@ieee.org.
- The version number above, along with the date, may be used by the submitter to distinguish successive updates of this document. A separate, unique Industry Connections (IC) Activity Number will be assigned when the document is submitted to the ICCom Administrator.

1. Contact

Provide the name and contact information of the primary contact person for this IC activity. Affiliation is any entity that provides the person financial or other substantive support, for which the person may feel an obligation. If necessary, a second/alternate contact person's information may also be provided.

Name: Ariel Conn
Email Address: ariel.conn@gmail.com
Employer: Mag10 Consulting
Affiliation: Founder/President

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

2. Participation and Voting Model

Specify whether this activity will be entity-based (participants are entities, which may have multiple representatives, one-entity-one-vote), or individual-based (participants represent themselves, one-person-one-vote).

"Individual-Based"

3. Purpose

3.1 Motivation and Goal

Briefly explain the context and motivation for starting this IC activity, and the overall purpose or goal to be accomplished.

Limited levels of autonomy have existed in weapons systems for decades. However, recent computational advances, especially in the field of artificial intelligence (AI), have changed the scope of what a weapons system can accomplish autonomously. Capabilities today extend beyond such competencies as navigation and radar detection to include facial recognition software, swarming technology, extensive data analysis, and much more. Further, autonomous weapons systems (AWS) are increasingly allocated tasks that were previously reserved only for humans.

A group of experts, the Research Group on Issues of Autonomoy and AI in Defense Systems (the Research Group), has been convened by IEEE SA to discuss and document challenges as an initial step to help bridge the gap between general principles and practical insights in this sensitive and vital domain. The aim of this group is to create a knowledge base of best practices regarding the development, use, and governance of autonomous weapons systems, initially based on the guidelines first established by AWS-related principles and later updated to reflect evolving technological advancements and international norms and regulations.

3.2 Related Work
Provide a brief comparison of this activity to existing, related efforts or standards of which you are aware (industry associations, consortia, standardization activities, etc.).

To date, the only set of principles dedicated solely to AWS were those developed at the (The United Nations Convention on Certain Conventional Weapons (CCW) in 2018 and updated in 2019. As such, these principles formed the basis for the development of our challenges. We also found weapons-related guidance in more general AI Principles, including the US Department of Defense's 2020 Artificial Intelligence Principles (from Defense Innovation Board / DIB Primary document), the IEEE's Ethically Aligned Design Principles, the European AI High-Level Expert Group's Principles, the OECD's Principles, and the UNESCO Principles. Additionally, the ICRC and SIPRI released a joint paper in June 2020, identifying some of the broader challenges of defining and achieving human control for AWS. Though the ICRC/SIPRI paper focuses more on challenges and solutions within the context of the CCW framework, it served as a helpful starting point for many of the challenges outlined below.

3.3 Previously Published Material
Provide a list of any known previously published material intended for inclusion in the proposed deliverables of this activity.

See above.

3.4 Potential Markets Served
Indicate the main beneficiaries of this work, and what the potential impact might be.

The Research Group that created the initial Challenges document (see below) have found that discussions regarding autonomy and AI in defense systems typically focus on legal and ethical issues surrounding AWS, with less attention to specific technical capabilities and limitations, and we seek to fill that gap with our work. We hope that more grounding in technical challenges will help enhance and advance those legal and ethical discussions.

This is why the main beneficiaries of this work will be:
- Technical experts working in various areas related to autonomy and AI in defense systems (engineers, data scientists)

- Manufacturers creating autonomous and AI techology in the government / military and civilian / consumer sectors (eg, commercial or toy drones)
- Policy makers working to address AWS issues in relation to AI Principles / regulation

3.5 How will the activity benefit the IEEE, society, or humanity?

Advancements in AWS have raised questions at national and international levels about what is technologically possible and what is legally and morally acceptable regarding autonomy and AI in a weapons system. Creating our Challenges document and getting feedback from a wide and diverse array of global stakeholders provides key opportunities for deliberation, parity, and where possible, peaceful use (or non-use) of AWS in a technical realm that is sorely in need of responsible and human-centric design.

In terms of our specific offerings, we are providing stakeholders a chance to review the list of challenges in our work and provide feedback. Once we've updated the challenges to reflect relevant feedback, these challenges will help guide companies developing AWS to consider how to inform and update their work. Members of the committee have already begun to consider the Challenges document with respect to the work being done at their own companies (e.g. Milrem Robotics and Thales Group).

We also plan to work with policy makers to discuss the realistic technical capabilities and limitations of autonomy and AI in defense systems to help them better understand and form consensus around whether or not current laws are sufficient to cover the use and development of AWS.

The meetings and discussions with stakeholders and policy makers will provide the groundwork for IEEE's ability to have this Initiative serve as a body of subject matter experts available to provide thought leadership on specific questions or issues around autonomy and AI in defense systems. The origin of the Research Group came from this existing need and precedent. Specifically, in 2020 key policy and corporate stakeholders approached senior IEEE staff asking if they could provide expert technical and socio-technical recommendations around AWS. The work of this Initiative will provide the basis for that ongoing possibility, providing IEEE a leadership position in the midst of a series of cutting edge technologies genuinely defining how, or whether, global leaders will Advance Technology for Humanity in the spirit of parity and peace versus confusion and competition.

4. Estimated Timeframe
Indicate approximately how long you expect this activity to operate to achieve its proposed results (e.g., time to completion of all deliverables).

Expected Completion Date: 06/2023

IC activities are chartered for two years at a time. Activities are eligible for extension upon request and review by ICCom and the responsible committee of the IEEE SA Board of Governors. Should an extension be required, please notify the ICCom Administrator prior to the two-year mark.

5. Proposed Deliverables
Outline the anticipated deliverables and output from this IC activity, such as documents (e.g., white papers, reports), proposals for standards, conferences and workshops, databases, computer code, etc., and indicate the expected timeframe for each.

- The "Challenges on the ethical development, use, and governance of autonomous weapons systems" doc.
  - First draft completed in May, 2021.
- Final Challenges doc, updated after meetings and convenings with a variety of stakeholders. The Challenges and future papers would be published as Creative Commons documents ([CC-BY-NC 2.0](); Attribution Non Commercial 2.0 Generic) in order to engage the broad global AWS community in an easily scalable fashion.
  - To be completed June, 2022.
- The creation of webinars, videos, whitepapers and other marketing / communications materials to highlight the work of the Final Challenges documents (in all iterations)
  - Ongoing throughout creation and duration of the IC activity.

- Solutions to or best practices for addressing various Challenges, based on feedback from and convenings with stakeholders.
  - To be completed June, 2023.

5.1 Open Source Software Development

Indicate whether this IC Activity will develop or incorporate open source software in the deliverables. All contributions of open source software for use in Industry Connections activities shall be accompanied by an approved IEEE Contributor License Agreement (CLA) appropriate for the open source license under which the Work Product will be made available. CLAs, once accepted, are irrevocable. Industry Connections Activities shall comply with the IEEE SA open source policies and procedures and use the IEEE SA open source platform for development of open source software. Information on IEEE SA Open can be found at https://saopen.ieee.org/.

Will the activity develop or incorporate open source software (either normatively or informatively) in the deliverables?: No

6. Funding Requirements

Outline any contracted services or other expenses that are currently anticipated, beyond the basic support services provided to all IC activities. Indicate how those funds are expected to be obtained (e.g., through participant fees, sponsorships, government or other grants, etc.). Activities needing substantial funding may require additional reviews and approvals beyond ICCom.

Unplanned at this state but to be scoped out as necessary with the formalized IC Membership.

7. Management and Procedures

7.1 Activity Oversight Committee

Indicate whether an IEEE Standards Committee or Standards Development Working Group has agreed to oversee this activity and its procedures.

Has an IEEE Standards Committee or Standards Development Working Group agreed to oversee this activity?: No

If yes, indicate the IEEE committee's name and its chair's contact information.

IEEE Committee Name: Committee Name
Chair's Name: Full Name
Chair's Email Address: who@where

Additional IEEE committee information, if any. Please indicate if you are including a letter of support from the IEEE Committee that will oversee this activity.

IEEE collects personal data on this form, which is made publicly available, to allow communication by materially interested parties and with Activity Oversight Committee and Activity officers who are responsible for IEEE work items.

7.2 Activity Management
If no Activity Oversight Committee has been identified in 7.1 above, indicate how this activity will manage itself on a day-to-day basis (e.g., executive committee, officers, etc).

An executive committee will be formed (names listed below).

7.3 Procedures
Indicate what documented procedures will be used to guide the operations of this activity; either (a) modified baseline *Industry Connections Activity Policies and Procedures,* (b) Standards Committee policies and procedures accepted by the IEEE SA Standards

Board, or (c) Working Group policies and procedures accepted by the Working Group's Standards Committee. If option (a) is chosen, then ICCom review and approval of the P&P is required. If option (b) or (c) is chosen, then ICCom approval of the use of the P&P is required.

Industry Connections Activity Policies and Procedures

8. Participants

8.1 Stakeholder Communities
Indicate the stakeholder communities (the types of companies or other entities, or the different groups of individuals) that are expected to be interested in this IC activity, and will be invited to participate.

United Nations Convention on Certain Conventional Weapons, NATO, Brookings, and other think tanks, businesses and members of military involved in discussions on autonomous weapons systems.

8.2 Expected Number of Participants
Indicate the approximate number of entities (if entity-based) or individuals (if individual-based) expected to be actively involved in this activity.

8.3 Initial Participants

Provide a number of the entities or individuals that will be participating from the outset. It is recommended there be at least three initial participants for an entity-based activity, or five initial participants (each with a different affiliation) for an individual-based activity.

Use the following table for an entity-based activity:

Entity	Primary Contact	Additional Representatives
Entity Name	Contact Name	Name

Use the following table for an individual-based activity:

Individual		Employer	Affiliation
Emmanuel Bloch		Thales Group	
Ariel Conn		Mag10 Consulting	
Denise Garcia		Northeastern University	
Amandeep Gill		The Graduate Institute Geneva	
Ashley Llorens		Microsoft	
Mart Noorma		Milrem Robotics	
Heather Rof		John Hopkins University – Advanced Physics Lab	

8.4 Activity Supporter/Partner

Indicate whether an IEEE committee (including IEEE Societies and Technical Councils) has agreed to participate or support this activity. Support may include, but is not limited to, financial support, marketing support and other ways to help the Activity complete its deliverables.

Has an IEEE Committee agreed to support this activity?: No

If yes, indicate the IEEE committee's name and its chair's contact information.

IEEE Committee Name: Committee Name
Chair's Name: Full Name
Chair's Email Address: who@where

Please indicate if you are including a letter of support from the IEEE Committee.