



WORKSHOP ON 'EMERGING AI TECHNOLOGY FOR DECISION MAKING IN MARITIME DOMAIN'

16 - 18 Nov 22

1. Artificial Intelligence has propelled significant economic development in the last few decades, and more progress is envisaged in the near future due to higher levels of investments and experts employed in the field. Defence forces around the world are making significant investments to stay ahead in the adoption of AI. In order to successfully adopt AI technologies at an organisational level, Indian Navy has to overcome certain key challenges viz. mitigation of AI talent gap, identification and development of suitable use cases, etc.

2. In order to achieve Navy-wide adoption of AI technologies, there exists a requirement for building AI awareness in the Navy through conduct of various workshops, seminars etc. The Centre of Excellence (CoE) for Big Data at Valsura, has been instrumental in progress of pilot projects pertaining to adoption of AI and BDA in various domains. As part of initiatives on proliferation of AI/ BDA technologies in Indian Navy, Valsura had conducted a three-day webinar on '*Artificial Intelligence (AI) for Data Driven Navy*' from 07 - 09 Oct 20. Eminent speakers from Harvard University, Georgia Institute of Technology, IIT Bombay, IIT Hyderabad, DRDO and also from various industries viz. Amazon, Capgemini, Deloitte, Jio and IBM had enriched the webinar by presenting the latest trends and applications of AI in the armed forces. Continuing with the initiative, Unit has conducted an AI workshop from 19 - 21 Jan 22 on the theme titled '*Leveraging AI for IN*' with online participation from service personnel, academia and industry. The workshop included presentations by esteemed speakers from renowned IT companies (viz. Google, IBM, Infosys, TCS, Wadhvani AI and Applied AI) who provided an industry perspective on AI. Further, distinguished speakers from IIT Delhi, New York University, Amrita University and DA-IICT also presented latest trends and application of AI.

3. To further promote and accelerate the objectives of building AI awareness in the Navy, it is intended to conduct the workshop at INS Valsura from 16 - 18 Nov 22 in hybrid mode, with onsite as well as online participation from service personnel, academia and industry.

Call for Papers

4. The theme of the workshop is '***Emerging AI Technology for decision making in Maritime Domain***'. Papers are invited from academia, Officers (both serving & retired) and industry experts on the following sub themes: -

- (a) Demystifying AI – *Underlying principles of AI* (**Appendix 'A'** refers).

(b) Operationalising AI - *Moving beyond pilot phase* (**Appendix 'B'** refers).

(c) Democratising AI – *Use cases and lessons learnt* (**Appendix 'C'** refers).

5. **Selection of Papers**. The Papers would be examined by an expert panel and best papers in each theme category would be presented by the authors during the workshop. Further, selected papers would be published in a compendium over NUD for wider dissemination. Authors of selected papers will be intimated post scrutiny of papers.

6. **Instructions for Authors**. Papers (3000 - 5000 words) along with author's bio-data and passport size photo and author's certificate as per the submission guidelines placed at **Appendix 'D'** are to be forwarded by post and e-mail at *oicits.valsura@navy.gov.in* by 03 Oct 22.

7. **Registration**. Registration is free of cost, and registration link will become active on 15 Sep 22 on internet website of INS Valsura under <https://indiannavy.nic.in/> and on intranet site (for *IN* personnel) in Naval Unified Domain (NUD). The workshop will be conducted at INS Valsura and proceedings of the workshop would be live streamed through Webex to enable wider participation in the workshop. Participants registered through website would receive the links to workshop on their registered mail IDs one day prior to the event.

8. **Contact Details**.

The Commanding Officer
(for O i/C IT School)
INS Valsura
Jamnagar
Gujrat 361150

Telephone/ Fax: 0288-252-7277
E-mail: *oicits.valsura@navy.gov.in*
NUD: SNC-VAL-OICITS

SUB THEME 1: DEMYSTIFYING AI – UNDERLYING PRINCIPLES OF AI

1. To unleash the power of AI in the context of military enterprise applications, risks and benefits have to be carefully gauged. Some of the broad guidelines for any AI system should be responsibly developed, trained, tested and deployed. For example, fairness of the ML model sounds like a great goal, however, there are various definitions of fairness you can implement in AI models.

2. In general, AI principles to develop safe, ethical, responsible, trusted and acceptable AI have coalesced around set of five areas as follows: -

- (a) Fairness and bias
- (b) Trust and transparency
- (c) Accountability
- (d) Organisational benefit
- (e) Privacy and security

3. The range of topics and the opinions expressed on the Artificial Intelligence (AI) are so broad that clarity on these central principles as mentioned above are to be discussed and refined. It is imperative to understand these facets to achieve organisational goals by leveraging AI. Towards this, following areas have been identified, but not limited to: -

- (a) Insights into how AI systems can inherit bias and provides guidance on preventing bias from an organisational and technical perspective.
- (b) Insights into explainability/ interpretability since many AI systems are black boxes or unintelligible to human beings.
- (c) Complex supply chain of AI systems that may involve data providers, data labellers, technology providers, system integrators, etc. When an AI system goes wrong, then how do we localise the error.
- (d) Technology scan for recent developments in AI which aligns with potential use cases of Military.
- (e) Developments in the light of upcoming data protection act by Govt. of India and guidelines issued by Data Security Council of India (DSCI).

4. The authors may provide an overview of basic building blocks towards identifying opportunities and threats, providing valuable background and structure in the context of military/ maritime applications.

SUB THEME 2: OPERATIONALISING AI - MOVING BEYOND PILOT PHASE

1. AI and its limitless application in Naval operations has grabbed the imagination of strategic planners worldwide. While the pool of organisations ramping up investments in AI is growing rapidly, only a handful of businesses that have managed to scale the technology are actually reaping its full benefits. As per a recent survey among thousand businesses around the world, most of them were in the pilot/ proof of concept phase of their AI investments, with only a third using the tech in production¹.

2. The applicability of AI to Naval operations surpasses its usage in any other military domain due to the hostility, unpredictability and sheer size of the ocean environment.

3. Possible areas to further explore are as follows: -

(a) Various challenges in productionising AI models in the context of Military/ Maritime Domain.

(b) Need for AI education and awareness towards gaining trust of senior leadership.

(c) Level of AI maturity in various sectors of its application within military/ Maritime domain vis-à-vis application in civil/ private sector.

(d) Analysis of reasons why handful of AI projects in pipeline are falling short of expectations and how to improve the same.

4. We request participants to delve into the various facets in the context of Military and Maritime Domain that can be augmented to quickly enable us to move from pilot phase to production phase. Papers may also be submitted on application of AI on any pertinent use cases under this sub theme.

¹ Survey Report by M/s Capegemini in 2017

SUB THEME 3: DEMOCRATISING AI - USE CASES AND LESSONS LEARNT

1. The recent advent of Deep Learning (DL), first in images and videos and then in text marked beginning of a new era in Machine Learning (ML), Natural Language Processing (NLP), and more generally in Artificial Intelligence (AI). Model-driven Engineering or MDE, where models drive software and systems engineering, is not alien to using AI techniques either, and this field is evolving by leaps & bounds.
2. Applying AI more selectively will help stakeholders accept that those AI solutions are appropriate. Distinguishing which challenges would benefit from AI and which challenges do not lend themselves to AI, gives users more confidence that AI is deployed responsibly, justifiably and in consideration of existing norms and safety. Understanding more about the use cases undertaken by various players in the field and the lessons learnt by them would be of immense value in our pursuit of AI enabled services/ products. Uncertainty and the unexpected are part of reality, but resiliency comes from having many ways to prevent, moderate or recover from mistakes or failure.
3. Possible areas to further explore under this sub theme are as follows: -
 - (a) Insights into improving resilience by collaborating with end users from the development stage itself.
 - (b) Discussions on various use cases of AI in the private and public organisations which are significant with the Military / Maritime Domain.
 - (c) Possibilities of red teaming the technology to detect early bugs and shortcoming of the AI models.
 - (d) Safe and secure ways which can be emulated to ensure reliance on growing data in order to enable accurate and more tailored output/predictions by AI models.
4. We request authors to delve into areas not limited to above in the context of military/ maritime applications.

SUBMISSION GUIDELINES

Authors are requested to follow the guidelines given below: -

1. The paper should be composed in 12 point Arial single spaced font for the main body of the text, and 10.5 point Arial single spaced font for footnotes using MS Word 2003 and above. The tentative length of the paper should be 2000 – 5000 words (excluding footnotes, acknowledgements, title and sub title). Use footnotes at the end of each page.
2. An Abstract of about 200-300 words should be included to describe the main argument and the conclusions of the paper. The Abstract should not contain footnote references.
3. The first sheet should carry details of the author's bio data (a brief resume of about 200 words), institutional affiliation, a passport-size photograph and the mailing and email address.
4. All diagrams, charts and graphs should be referred to as Figures and consecutively numbered (Fig.1, Fig.2, and so on). Tables should carry only essential data and should complement the text rather than repeat what has already been said. They should carry a short title, be numbered (Table 1) and carry the source at the bottom.
5. Each table must be referenced in the text. If actual statements or phrases are taken from another paper, the name of the author should be mentioned in the text and the chosen material should be placed within quotation marks with an appropriate reference. Alternatively, if another author's views are to be summarised, use the formulations: 'The views of xyz are summarized'; give a crisp summary. It is a good practice to reference sources of information extensively and effectively.
6. Author's acknowledgments(s) may be included at the end of the paper and before References/ Endnotes begin.
7. The paper should have sub-headings to make it more reader-friendly.
8. References/ Endnotes should be sequentially numbered.
9. The authors are responsible for accuracy of the reference.
10. If the same reference is to be cited after a few other references/ citations, write the name of the author followed by the citation number e.g.: Ram Kumar no.16.
11. Any submission not conforming to the above requirements is incomplete and is liable to be rejected by the Review Board.

12. By submitting the paper, the author agrees that '*INS Valsura reserves the rights to publish, re-publish the paper with due credits to the author(s)*'.

13. A Certificate of Authenticity, countersigned by the author, with the following details should accompany the paper: -

"The paper is the original effort of (author's name, rank, personal number) and the undersigned hereby attest that all material (tables, figures, diagrams, arguments) from primary and secondary sources has been duly cited. The paper bears no Plagiarism in any form. The paper has not been sent to any other publication and has not appeared in print or electronic medium before. The text of the paper does not contain any material above Unclassified."

