

Future Trends in Maritime AI and Data Analytics

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A*STAR



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Agency for
Science, Technology
and Research

SINGAPORE

Our Mission

We advance science and develop innovative technology to further economic growth and improve lives

Our Vision

A global leader in science, technology and open innovation



A*STAR IHPC: To advance science and technology using **AI and Modelling & Simulation** and to develop impactful innovations to **create economic and societal impact**



- > **370** researchers with expertise in:
- **AI and quantum computing**
 - **Complex systems modelling**
 - **Multi-scale & multi-physics modelling**
 - **Social & behaviour sciences**



Thought leaders who are among **most highly cited scientists in the world**, or **recognized in international scientific bodies**



- > **250** scientific papers published annually, with strong collaborations with IHLs



Strong collaborations with industry & government agencies for translation R&D



- International & local science & technology **awards**
- Innovated **award-winning products** with partners
- Winner of best papers & international competitions

The Global Maritime Analytics Market



US\$1,833.50
million by 2027



US\$894.28
million in 2019

Grow at a CAGR of 10.0% during 2020-2027

Global maritime analytics market
By Globenewswire

Key factors driving maritime AI



The need to boost maritime logistics customer experience



The need to improve efficiency



To accelerate digitalization & innovation



The need to enhance the connection with the dynamic world



Future AI Trends in Maritime



Multi-modal big data from internal & external sources as new “fuel” for value creation and connectivity



Intelligent and hyper-automated maritime operation processes for greater effectiveness and efficiency



AI + IoT integration to marry intelligence and sensing for real-time maritime decision making



Resilient & Safe AI as the next-gen **engine** for robust and reliable maritime operations



Barriers to AI Implementation

**Poor data quality
and lack of
digitalisation
strategy**

**Data sharing and
trust issues across
value chains**

**Finding good use
cases to create
business value**

**Shortage of AI
talents and in-
house skills**

Feedback from Singapore's Maritime Community Maritime AI workshop in Dec 2021:

AI development stage at your organisation:

- I. Have in-house AI team and development is on track
- II. Just started, at nascent stage
- III. Yet to start, need to know more about AI

Obstacles faced when applying AI:

- I. Data issues
- II. Lack of AI expertise
- III. Lack of digitalisation

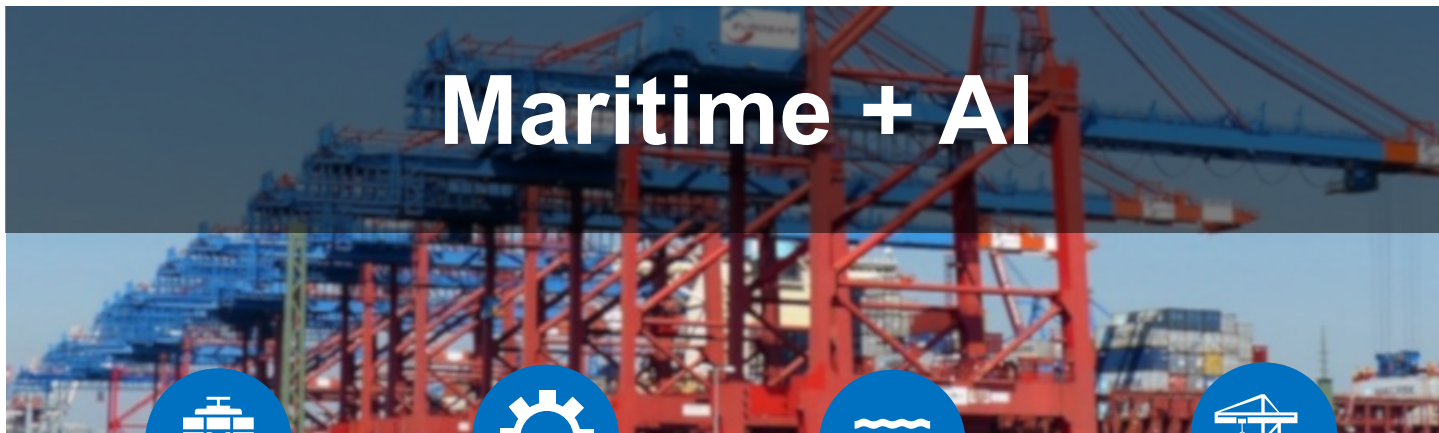
Support needed from RIs and IHLs:

- I. R&D collaboration with funding support from agencies
- II. Maritime AI prototype models for test-bed/deployment
- III. AI training



Maritime AI for Industry

Eg. of collaborators:



SMART SHIPPING



**ENGINEERING &
EQUIPMENT**



**DECARBONISATION /
SUSTAINABILITY**



**NEXT GENERATION
PORT**

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A*STAR's Maritime AI Capabilities



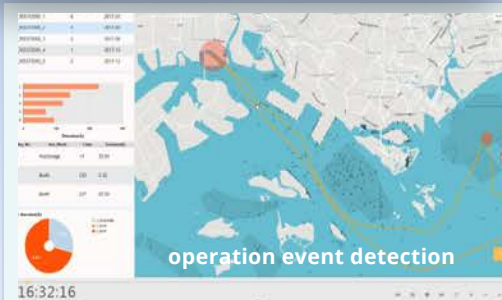
Maritime Traffic Management

AI based traffic safety
enhancement
From passive to proactive



Port Optimisation

Multiple systems
(ship + fleet + terminal + port)
From siloed to connected



Global Maritime Supply Chain

Global maritime port network
From local to global
maritime supply chain



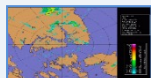
Big Data Fusion, Reconstruction and Analytics, and AI based Predictive Modeling



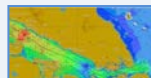
AIS



SAR



Met data



Ocean-graphic data



Shipping



Port operation

+ human data (video, voice etc.)
+ other sensor data (Wave,
Currents, Wind, Temp) ...



5-year Maritime AI Programme (under plan)

2022

2023

2024

2025

2026

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Phase
2

**Scaling up AI models,
applications, and platforms**

Phase
1

- **Landscape deep dive**
- **Data and AI models**
- **Pilot use cases development**

- Grant calls on targeted capabilities
- Bring in RIs & IHLs with relevant capabilities for projects
- Engage agency and industry for use cases & trials

- Incorporate AI models, applications from RIs and IHLs into prototype platform(s), and testbed with industry partners
- Industry can tap on technology and use cases to create impact

Innovative & Competitive Maritime AI Ecosystem

- Strong AI capabilities, tools and collaboration
- Improved digitalisation and decarbonisation

STAKEHOLDERS:
Maritime Authority

Ports

Ship Owners

**Maritime tech
companies**

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Maritime AI Workshop

AI and Big Data Intelligence are the Future Engine for Maritime Growth

Artificial Intelligence (AI) has increasingly attracted investments and affected all sectors in their transformation development and planning, including the maritime industry. Therefore, careful consideration of how AI applications could be adopted in maritime is paramount and require efforts from all relevant stakeholders, particularly because they may share similar resources or rely on similar underlying big data and models.

In this workshop organised by A*STAR's Institute of High Performance Computing (IHPC) and Singapore Maritime Institute, participants are invited to discuss, identify the challenges and gaps, and share their ideas for developing key capabilities, outlining potential opportunities to advance maritime AI research and the use of domain knowledge and scientific data to support a transition toward next-generation maritime development for Singapore and the world.



Welcome Speech & Closing Remarks

Dr Lim Keng Hui
Executive Director
Institute of High Performance Computing (IHPC)
A*STAR



Opening & Closing Remarks

Mr Tan Cheng Peng
Executive Director
Singapore Maritime Institute (SMI)



AI Landscape in Singapore

Prof Bryan Low
Director of AI Research
AI Singapore



Maritime AI Program & Proposed Use Cases

Dr Fu Xijun
Senior Scientist
Institute of High Performance Computing (IHPC)
A*STAR

To view the programme and register,
[click here](#)*

9:00AM - 12:30PM
MPH 1 & 2
Level 1, Innova Building
2 Fusionopolis Way, Singapore 138634

*To ensure health and safety, all participants will have to be fully vaccinated.

Jointly organised by:



DEC
03

- AI has big potential in maritime operations
- Numerous challenges and research questions to be addressed
- Welcome to join us for the **national Maritime AI program**

Welcome your inputs and collaboration on maritime AI program and use cases



Scan to provide your
inputs to use cases

www.linkedin.com/company/ihpcsg/

Email: iddmgr@ihpc.a-star.edu.sg



CREATING GROWTH, ENHANCING LIVES



THANK YOU

www.a-star.edu.sg