



**United
Nations**

DESA
UNCTAD



AIS Big Data
Hackathon,
3-6 September

AIS Hackathon

3-6 September 2020

Concept Note

Executive Summary

The automatic identification system (AIS) is a tracking system for ships, originally developed for collision avoidance. The data is automatically transmitted every few seconds over very high frequency (VHF) radios from approximately 100,000 vessels worldwide. In recent years, it is also used for analyses from various fields¹ including for real-time estimates on the economic impact of the COVID-19 pandemic. To facilitate ongoing research using AIS data, the UN Global Working Group (GWG)², which promotes the practical use of Big Data sources, has made data available in the UN Global Platform (UNGP). In addition, AIS Task Team under the GWG has been active to coordinate activities and promote the use of AIS datasets. Among its achievements are the AIS Handbook³ and AIS Data Week⁴.

Due to ubiquitous applications using AIS data, there is an expectation that it can be utilized to monitor the impact of COVID19 pandemic to the society. However, it is challenging to apply the data to its fullest potential without involving external researchers and other parties who can think outside the box. Thanks to the availability of AIS data in UNGP, it is possible to organize a virtual Hackathon by allowing remote access to external researchers. Without allocating funds for a venue, travel expenses, and per diems, as would be expected for an in-person Hackathon, the cost for a remote access event can be drastically reduced. However, additional funds are required for a temporary increase in the power of the computing clusters of the UN Global Platform to allow a large number of concurrent users, a non-monetary prize, and the acquisition of additional AIS data from the first quarter in 2019 and/or other relevant datasets to allow for more meaningful comparisons of vessel movement before and during the COVID-19 pandemic.

The AIS Hackathon is run jointly by UNSD (using funding from the Development Account 10th Tranche), UNCTAD and UN Global Pulse in collaboration with MarineTraffic and consultation with the Task Team members. In addition, the Hackathon supports the recent initiative of UN Data strategy (www.un.org/datastrategy) with following objectives: to help respond to COVID-19 and build back better, to drive the Decade of Action for the SDGs, to amplify climate action, to promote gender equality, to protect human rights, to advance peace and security, and to accelerate and consolidate UN Reform.

¹ <https://unstats.un.org/wiki/display/AIS/Case+studies>

² <http://unstats.un.org/bigdata>

³ <https://unstats.un.org/wiki/display/AIS/AIS+Handbook+Outline>

⁴ <https://unstats.un.org/unsd/trade/events/2020/AISDataWeek>

OBJECTIVES

The main objectives of the Hackathon are to:

- Utilize AIS and relevant datasets to develop tools, resources, analysis and visualizations which aim to gauge and/or monitor the economic and social impact of the COVID-19 pandemic on society, or for Climate Action research to provide a basis for evidence-based policymaking to achieve the SDGs
- Promote the activities of UN GWG and notably the UN Global Platform as a shared and trusted platform for collaboration on the use of Big Data sources, and to assist the AIS Task Team in promoting the use of AIS data for official statistics and experimental indicators
- Establish closer relationships with researchers, academia and other partners

EXAMPLE RESEARCH QUESTION

- COVID-19 has led to a steep decline in cruise tourism, which is an important economic activity for many island and coastal countries. Can we combine web scraped data from online cruise calendars, Maritime registers, and AIS data to deliver reliable statistics on the number of cruise ships and the number of passengers (preferably also on tourists and crew) arriving and departing from/to a country or island?
- Decreasing the amount of fuel used for maritime transport would have a positive impact on climate change. Can AIS data be used to increase fuel efficiency? For example, by modelling the optimal speeds for specific sections of a given route⁵.
- Bulk of international trade is powered by maritime transport. A better understanding of the ship's movement would be beneficial to nowcast and even forecast trade data. However, even though AIS data do not contain cargo information being transported – they can be useful to monitor international trade. But, how to bridge the data gap between the ship's movement and trade volume?
- Which official statistics can be positively impacted by AIS as new a data source?
- How to clearly visualize such global data in the light of the different research questions.

PARTICIPANTS of HACKATHON

Participants of the Hackathon will be researchers and data enthusiasts from academia, institutions including National Statistical Offices, Data Science Campus, and other

⁵ See “Just-in-time sailing” developed by the GloMEEP Global Industry Alliance to Support Low Carbon Shipping <https://www.youtube.com/watch?v=ioUpqZUNSlg&feature=youtu.be>

interested researchers/research teams. If interest exceeds capacity, the participants will be selected from all applicants keeping in mind the quality of the applications, regional diversity, and a balance in terms of gender and diverse professional backgrounds. Approximately fifteen 2-5 person teams from various backgrounds will be chosen, and an ideal grouping of teams would include data scientists, statisticians, economists and social scientists.

Teams from developing countries are strongly encouraged to participate.

PRIZES

Participation in UN World Data Forum

The lead of the winning team will receive funding to attend the UN World Data Forum in Bern, Switzerland in 2021 in order to present their work and to receive certificates and rewards. In addition, selected teams would be invited to make presentation in the context of the Virtual World Data Forum in October 2020.

Teleconference with a prominent person

Winners of the best all-student team will conduct a teleconference with high level ranking UN officials to discuss their results.

Certificates

Apart from the main prizes, every participant will receive a certificate acknowledging their participation and thanking them for their contribution. The certificate will mention the rank of the top 3 teams and the top 3 all-student teams.

AIS PLATFORM

In order to ensure meaningful analysis and smooth operation of the UNGP AIS platform during the Hackathon, the following actions would be applied:

- The addition of historical AIS data from the first quarter in 2019 and/or other relevant datasets to allow for more meaningful comparisons of vessel movements before and during the COVID-19 pandemic
- Temporary increase in computing capability of UN Global Platform to allow a large number of concurrent users

TIMELINE

Activity	Jun	Jul	Aug	Sep	Oct
Finalizing Project Notes					
Finding Partner Organizations					
Save-the-date (mid-Jun)					
Acquisition of additional historical AIS data					
Registration Open (beginning Jul)					
Application Deadline and Selection					
UN Big Data Conference (31 Aug – 2 Sep)					
Hackathon (3-6 Sep)					
Winners announcement					
Virtual UN Data Forum					
Distribution of Certificates					

[Annotated Timeline Details](#)

June-July: Agreement with GPSDD on acquisition of data including administrative procedure to transfer funds

10 July: Announcement on the website of UNSD; website of Big Data UN Global Working Group; website of UN World Data Forum; social media account; Use e-mail list of university professors; use networks of AIS and other partners to distribute more effectively; Registration Open

2 Aug: Deadline to register

9 Aug: Deadline for abstracts for registered teams

14 Aug: Selected participants are notified. They will receive a small excerpt of the AIS data to familiarize themselves with the format and sheets that describe the data and how it could be used.

31 Aug- 2 Sep: Conference on Big Data for Official Statistics

3-6 Sep: Hackathon with access to Global Platform (or making datasets downloadable)

7 Sep: Presentation of results

15 Sep: The winning team gets notified. Preparation to make presentation in the context of the virtual UN World Data Forum.

18-21 Oct: Announcement of Winners + talks of the winning team in Virtual World Data Forum.

End of October: distribution of certificates and prize for best all-student team.

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