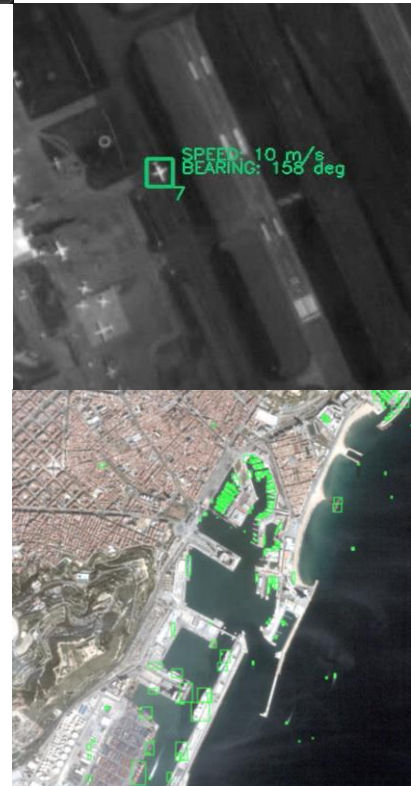


VANTAGE

Coding Challenge:

“Aircraft / Ship Detection and Motion Tracking in Space Videos”

14 February to 14 March 2022



Announcing a new VANTAGE Coding Challenge – with generous cash prizes to be won!

Earth-i, CGI and ESA are calling for geospatial coding enthusiasts to use the VANTAGE platform in February-March 2022 to showcase innovative ways to detect and track moving objects in satellite videos.

Participants will have the option of detecting and tracking aircraft at airfields or large marine vessels in ports – or both if you wish!

The competition is open to all Earth Observation algorithm developers and enthusiasts worldwide. Read on for more details...

VANTAGE is an online, cloud-based platform for analysis and exploitation of **video from space**. Funded by the European Space Agency (ESA) and implemented by Earth-i and CGI, the platform includes a repository of high-definition videos captured from Earth Observation satellites, along with a suite of analytical tools for extracting value and insight from the videos; and support for user-defined workflows and algorithms through Jupyter Hub integration.

More information and a selection of sample satellite videos can be viewed here: https://www.youtube.com/playlist?list=PLmMcAfW_XwL5vYUF4suf8JBQeRola98Ys

The Vantage Coding Challenge for Feb-Mar 2022

The Aircraft Challenge



Implement code to detect presence of aircraft in successive frames of a video acquired from space, and show that you can track the movement of an aircraft from one frame to the next. Optionally, work out the speed and direction of the aircraft. Satellite videos of airports with moving aircraft will be available.

The Marine Vessel Challenge



Implement code to detect presence of large ships in successive frames of a video acquired from space, and show that you can track the movement of a ship from one frame to the next. Optionally, work out the speed and direction of the ship. Satellite videos of seaports with moving ships will be available.

You can enter for one or both of the challenges, and you can enter as an individual or as a team. Cash prizes will be awarded for the best solutions, as judged by a combined panel of ESA, Earth-i and CGI.

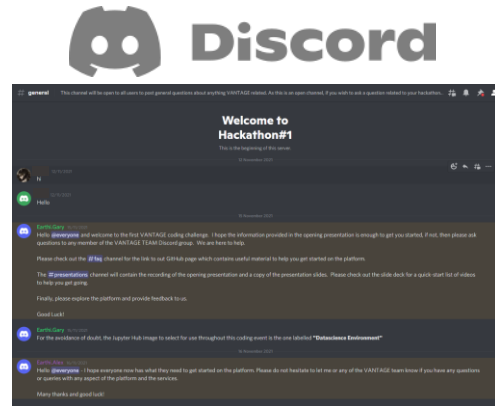
Best solution for aircraft: 1st Prize: €2500, runner-up €1500

Best solution for marine vessels: 1st Prize €2500, runner-up €1500

Competition Details

The competition runs over a period of one month, including the weekends in between if you wish to use them – we will do our best to ensure the VANTAGE platform remains available throughout the period.

Technical support will be available from Earth-i and CGI during normal European working hours on weekdays via our DISCORD platform.



We will provide to all participants:

- A dedicated workspace on the VANTAGE cloud platform (in AWS)
- Access to satellite videos from the VividX2 mission for seaports and airfields
- Instructions and worked examples for labelling aircraft and ships in the videos
- Access to Jupyter Hub with key Python libraries (FFMPEG, OpenCV, PyTorch, TensorFlow, Keras – others could be made available on request)
- Access to predefined video processing algorithms and services in VANTAGE
- Access to example Jupyter notebooks on GitHub (how to read/write video data, format/structure of the data, daisy chaining services in VANTAGE)

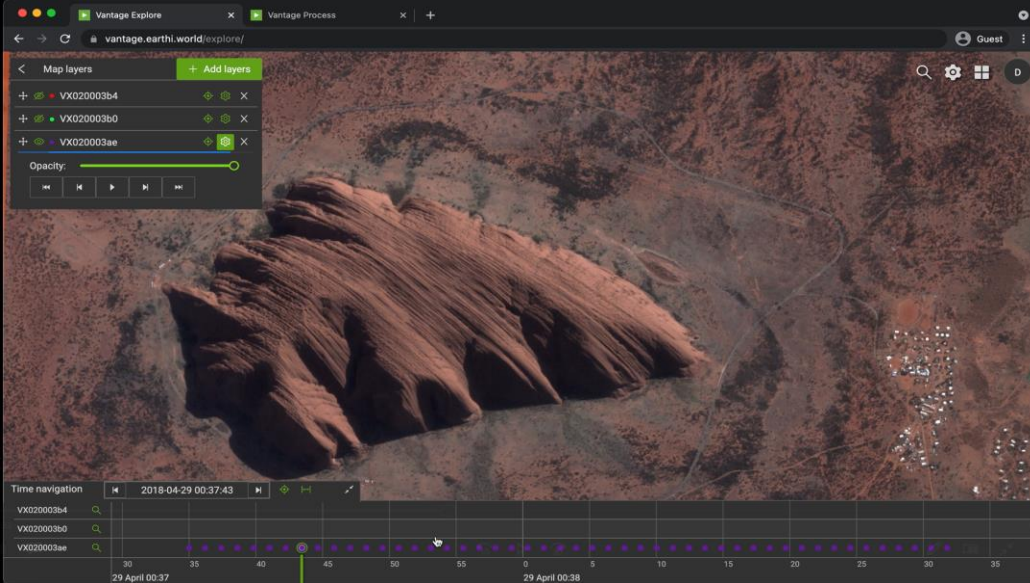
Event Timetable & Registration Details

Registration Deadline: 10 February 2022. Register by sending an email to info@earthie.co.uk including your name, contact information and affiliation, and details of any particular resource requests you may have. You will need a Google or LinkedIn account to access the VANTAGE platform.

Competition Starts: 14 February 2022. An introductory briefing and tutorial webinar will be held on 14 February at 10:00 CET and will be recorded for later viewing. Q&A Webinars will be held on 21 & 28 February and 07 March at 10:00 CET. Tech support will be available 10:00-17:00 CET each weekday.

Competition Ends: Monday 14 March 2022. Individual 15-minute presentation slots will be organised for participants to present their results to the judging panel on Monday 14 March. Winners will be announced in an awards ceremony to be held on Tuesday 15 March. Zoom invitations will be sent to all participants.

Any questions or doubts, please email info@earthie.co.uk



Judging Panel and Criteria

All participants will be required to give a 15-minute presentation of their work to the judging panel on the final day of the competition. If you are in a different time zone and cannot attend, you may submit a pre-recorded video presentation, or PowerPoint slides with speaker notes.

All participants will also be asked to fill in a feedback form detailing their experience of using Vantage for coding, and providing suggestions for improvement of the platform.

Everyone who participates for the duration of the event, by being visibly active on Discord and delivering a final presentation and feedback form, will be given a **€100 gift voucher** as a token of appreciation for their participation.

Important!

You are free to develop your code and train your AI models off-line using your own ICT resources if you wish; but your final code must be suitable to be uploaded and executed in the VANTAGE platform using the satellite videos present.

Competition winners will be selected by a judging panel including Earth-i, CGI and ESA representatives. The panel members will be looking for:

- Compatibility** in terms of producing code that runs in the VANTAGE platform;
- Innovation** in terms of approaches to tracking moving objects in satellite videos;
- Optimisation** in terms of algorithms that are not excessively resource-hungry;
- Quality** in terms of the accuracy and reliability of the output products generated;
- Value** in terms of potential for end-user applications or further development.