EUROPEAN STUDENTS SPACE
HACKATHON

8th — 9th OCT

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OVERVIEW

Here you will find all the information you need to take part in The EUROAVIA Mission, which is a 24 hours Hackathon in which you will have to find new solutions to solve challenges that space companies truly face nowadays. Apart from meeting industry experts and showing them your knowledge, you can also aim for fantastic prizes!

CHALLENGES

You will join one of the four following challenges. All of them have been proposed by our sponsors and you will have the opportunity to attend preparation webinars to gain the required knowledge to work on them:

DEEP LEARNING FOR EARTH OBSERVATION

MAP MATCHING FOR URBAN LOCATION

MISSION DESIGN SOFTWARE

SMARTPHONE APPLICATION DEVELOPMENT SHOWCASING THE FEATURES OF EGNSS AND COPERNICUS

DEEP LEARNING FOR EARTH OBSERVATION

Presented by EarthPulse

This challenge will consist in training a neuronal network that classifies satellite images. It is thought as an introduction to Artificial Intelligence and computer vision for the Earth observation. The participants will have access to the company's library in order to ease the process and will receive the necessary knowledge in the preparation webinar that will be held by the CTO of EarthPulse.

MAP MATCHING FOR URBAN LOCATION

Presented by Rokubun

The GNSS signal, albeit specifically designed to be used outdoors, suffers from high degradation of accuracy and availability in urban environments due to the presence of urban canyons (high buildings on the sides of the street). To solve for the loss of GNSS satellite visibility and increase of GNSS signal noise, additional sensors such as inertial measurement units (accelerometers, gyroscopes) or techniques (such as map-matching) can be used. The team will have access the following services: JASON (an on-cloud service to achieve high-accurate geolocation by uploading your GNSS campaign data) and MAPBOX (The Mapbox Map Matching API allows you to take recorded traces, such as the data from a GNSS unit or phone, and snap them to the OpenStreetMap road and path network).

MISSION DESIGN SOFTWARE

Presented by Sateliot

For the last 15 years a revolution in the space industry has been taking place. New space approaches have been taken by more and more players in the industry. Often these companies want to do things differently, but established methods, process and tools are not well prepared for the task. In this challenge we propose you to develop a mission design software/toolkit for small satellites missions. It is up to you to determine which features you want to include in it. You are free to use any existent code you have access to as long as the license allows it. There are multiple existing libraries and projects that can help you, for instance "Orekit".

SMARTPHONE APPLICATION DEVELOPMENT SHOWCASING THE FEATURES OF EGNSS AND COPERNICUS

Presented by EUSPA

Develop and further investigate the possibilities of using an Android and/or iOS smartphone to increase the adoption of the EU free satellite services. We have more than 2 billion users with a Galileo compatible smartphone, so any of them has already the technical capability to use EGNSS and Copernicus for daily tasks.

PRIZES

Absolute Category

- **1000€** given by the Government of Catalonia, the Institute of Space Studies of Catalonia (IEEC) and the i2CAT Foundation.
- **Brisk learning module in space economy** given by iSpace School: you will gain knowledge about Space Economy in a set of dynamic lectures provided by experts from the Space Sector and Forbes List makers.
- **Three (3) consulting hours** given by Bufete Mas y Calvet: the winning team will have access to legal orientation about any specific questions that the team may have. These hours will be provided by a legal consultor with a wide trajectory in the space sector.
- **Fast track Business Model lab** given by StartUB!: course for the initiation of business creations. It teaches the essential aspects of the process of defining the value proposition, working with various prototyping methodologies, analysing customer segments, identifying the types of costs and assessing possible sources of income and financing. The course ends with a session on how to make an elevator speech.

EUROAVIA Category

- **1000€** given by the Government of Catalonia, the Institute of Space Studies of Catalonia (IEEC) and the i2CAT Foundation.
- **Three (3) consulting hours** given by Bufete Mas y Calvet: the winning team will have access to legal orientation about any specific questions that the team may have. These hours will be provided by a legal consultor with a wide trajectory in the space sector.

Best project of Rokubun's Challenge

One (1) prize with a three (3) months access license to JASON: for each team member given by Rokubun. JASON is an on-cloud service to achieve high-accurate geolocation by uploading your GNSS campaign data.

THE MENTORS

During the whole competition the teams will be guided by professional mentors in both the technical and business site

BUSINESS MENTORS

Carlos Albareda

Lawyer and Consulant at BUFETE MAS Y CALVET

Lawyer with an intensification in business and administration. He has collaborated as a mentor in several European space programs in legal orientation to start-ups and tech companies.

Mireia Colina

Space Business Manager at GTD

Telecommunications engineer with 20 years of experience in the aerospace sector. She currently is the responsible of the development in space business in GTD. She is in charge of finding new global business opportunities in space.

Susana Soto

Business Innovation Engineer at ESA

Telecommunications engineer with 20 years of experience in the aerospace sector. She currently is the responsible of the development in space business in GTD. She is in charge of finding new global business opportunities in space.

TECHNICAL MENTORS

David Criado

Cofounder and CEO in RADIAN

Master in space systems by Universidad Politécnica de Madrid with a vast experience in the sector in both consolidated companies and New Space.

Alberto García-Rigo

Head of IEEC's Project Management Office

Associate Editor of IEEE's Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS). PhD and Post-Doctoral Research conducted on GNSS in Space Weather, Ionosphere and Precise Positioning applications.

Pol Guixé

Space Communications Director at I2CAT

Among others he has worked in Surrey Satellite System Ltd, Airbus and Innovation Solution in Space.

Jordi Gutíerrez

Professor in Universitat Politècnica De Catalunya

He is an astrophysicist who focuses his research in the stellar evolution of fundamental stars and the use of femto-satellites to study the lower area of the Thermosphere.

Javier Marín

Director of Applied A.I. at SATELLOGIC

He completed his Ph.D. in computer vision from the Universitat Autònoma de Barcelona (UAB) in 2013. His research interests lie mainly in the area of computer vision and machine learning.

THE JURY

Lara Arche
Innovation Manager at THALES ALENIA SPACE
She helps to create and develop innovative solutions for products and business in the space market. She's been working in Thales Alenia Space since she started 15 years ago in the Product Line of Radiofrequency and she has always been linked to R&D.

Juan Burgaleta
Quality Director at SATLANTIS
Previously Projects Manager, Technical management in research and development projects related with mechanical, electrical, electronic and control subjects. Experience in international projects coordinating with other foreign companies the technical subjects of design, development and product testing.

Efrén Díaz
Senior Associate at BUFETE MAS Y CALVET
He works as Senior associate and responsible in the Space Law area. He is doctor in Law and Delegated in the European Data Protection. He has also been acknowledge in The Best Lawyers in Spain 2020 and 2021.

Laura González
Cofounder and CMO in RADIAN SYSTEMS
Master in aerospace engineer by UC3M. She won the Airbus Airnovation grant as well as the SENER grand. She has experience in institutions as INTA and Satellite Applications Catapult.

Joaquín Reyes
Market Development Technology Officer at GSA
Working in the professional high-precision market on EGNOS and Galileo, focused on Agriculture topics. He gained his GNSS technical experience as System Engineer Technical Assistant at ESA/ESTEC, after several innovation projects in GMV and Siemens (Dimetronic).

SCHEDULE

OCTOBER 4th

WELCOMING

18:00 Welcome to the EUROAVIA Mission

18:30 How is the Hackathon going to work?

18:45 Q&A

19:00 Space missions, origin of the Universe and fundamental physics
by Licia Verde

19:35 Cultural dinner: **Get ready to cook!**

Time in CEST

OCTOBER 6th

PREPARATION WEBINARS

18:00 Deep Learning for Earth observation
EarthPulse

18:30 Map matching for urban location
Rokubun

19:00 Smartphone application development showcasing the features of EGNSS and Copernicus
EUSPA

19:30 Mission design software
Sateliot

Time in CEST

SCHEDULE

OCTOBER 8th
24H COMPETITION

15:00 Reception of candidates
Welcome messages and information from organizers

15:30 Finalization of teams and selection of challenges

16:00 Work starts

18:00 Progress meeting
with Technical Space Data experts

20:00 - 00:00 Back to work!

Time in CEST

OCTOBER 10th
24H COMPETITION

00:00 - 10:00 Back to work!

10:00 Progress meeting
with Business experts

12:00 Back to work!
Finalisation of presentations and pitch preparation

15:00 Presentation of the projects to the jury

17:30 Prizes awarded

Time in CEST