

Open APIs
for Open
Minds

#virtualhackathon

2X1 Hackathon

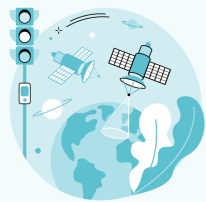
Shed Light-on red traffic lights Challenge



Iulian Gabriel Coltea – R&D Manager and Project Manager, KeyToBusiness - DYDAS

#DYDAS&SPOTTEDHackathon

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Shed Light-on red traffic lights
and urban greenery status.

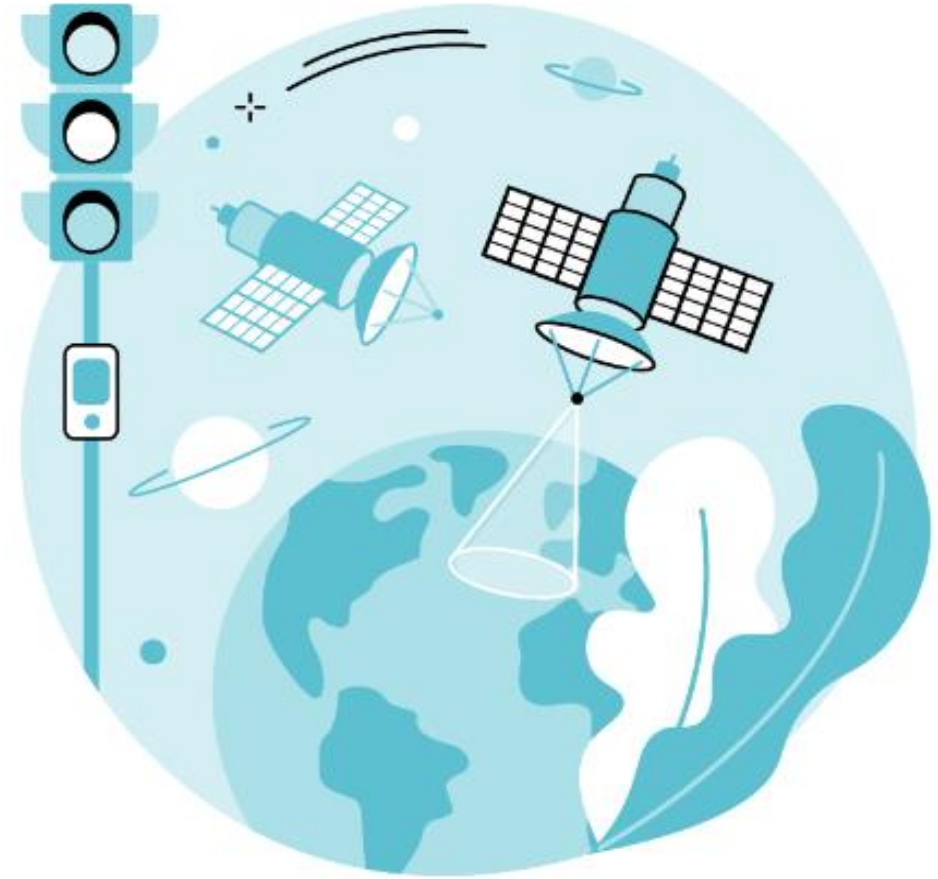




DYDAS Challenge Overview

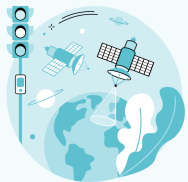
The challenge is based on the development of an algorithm or AI model able to optimize city traffic through traffic lights management



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DYDAS Challenge Overview

INPUT

A simulated and/or open data of traffic in a graph, representing a portion of a city (real or simulated).

PROCESS

The algorithm may use AI (**recommended**) and must have as input a graph that includes traffic lights status for each node and for each edge, and waiting cars/transited cars on each edge, in a 30 or 60 seconds timeframe.

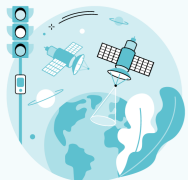
OUTPUT

A graph containing the changes in the traffic lights that must be performed to optimize overall traffic (updated graph).

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DYDAS Challenge – Step 1

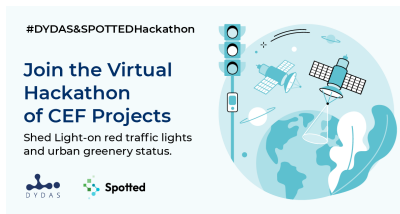
Go to DYDAS platform

- directly at <https://preview.dydas.eu>
- using the home site at <https://www.dydas.eu> and click



The beta version of the platform is now available to be tested for free. Register or log in with SPID or eIDAS. Create a project, use a template and discover the future!

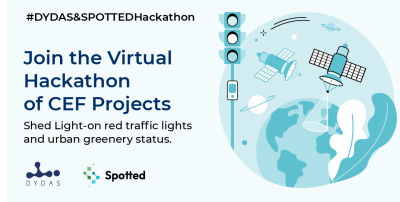
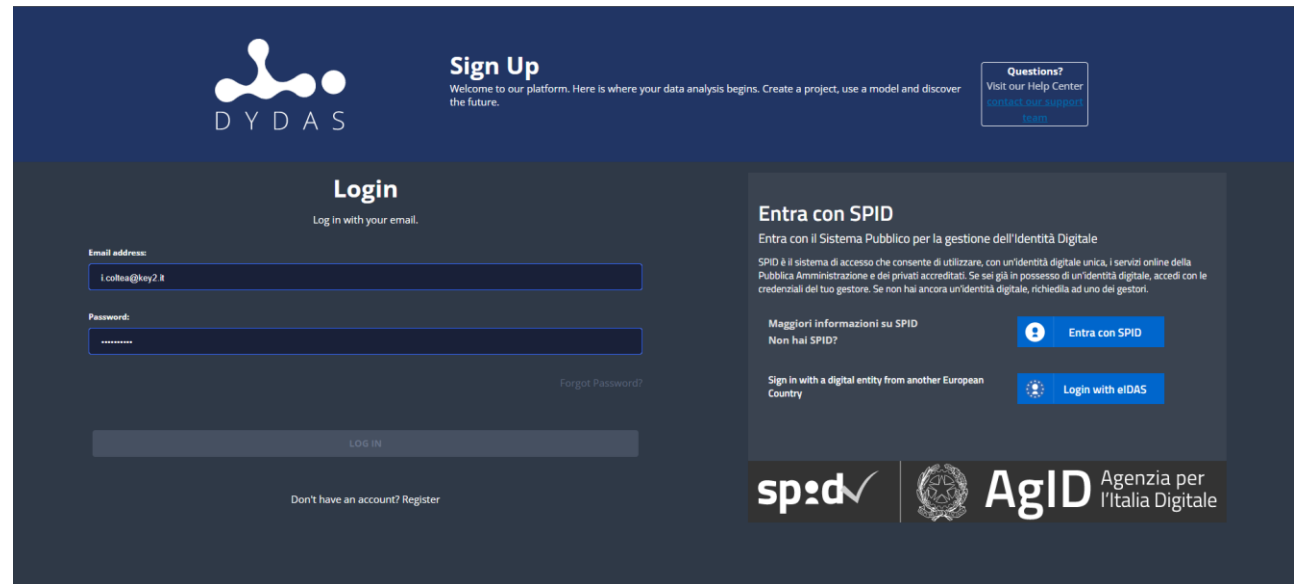
TRY THE PLATFORM



DYDAS Challenge – Step 2

Register to the platform or use your SPID credentials (eIDAS is not operative yet)

A help guide is available for download to guide you through the platform main features including indications for accessing data on FIWARE Context Broker.



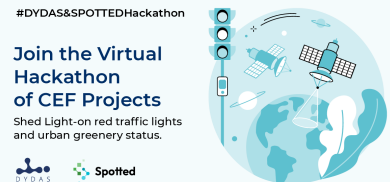
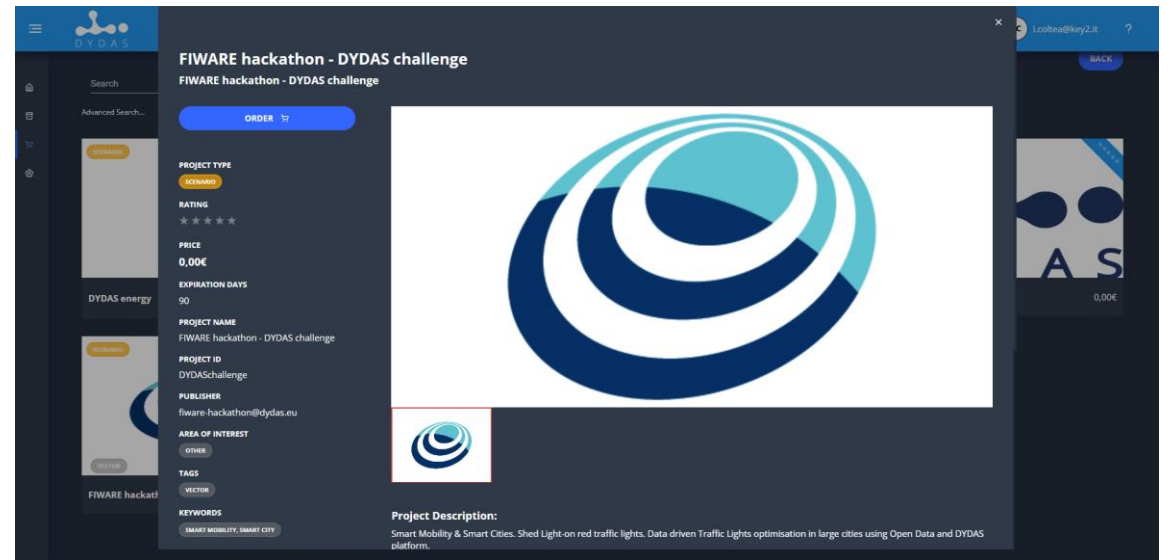
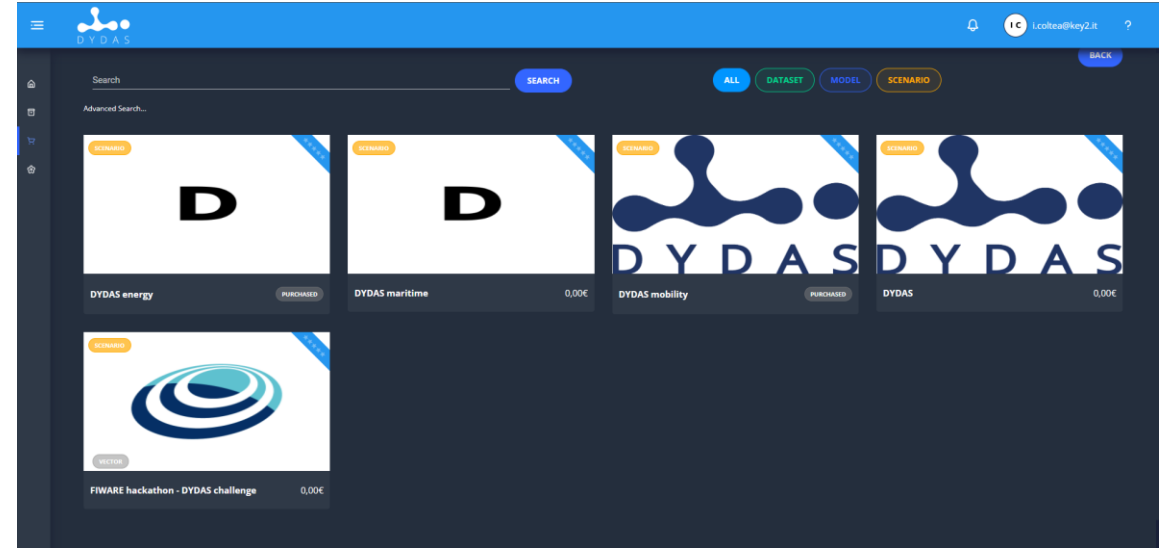
DYDAS Challenge – Step 3

Access to the platform is needed in this phase to be able to access the hackaton data

This data represents a simulated environment containing traffic lights and traffic flows in a graph

Using this data is **NOT** mandatory, but using the same data structure for input and output of the algorithm or AI model is required

So...find the data in DYDAS **Marketplace** section > **Search** and “buy” it (for free of course).



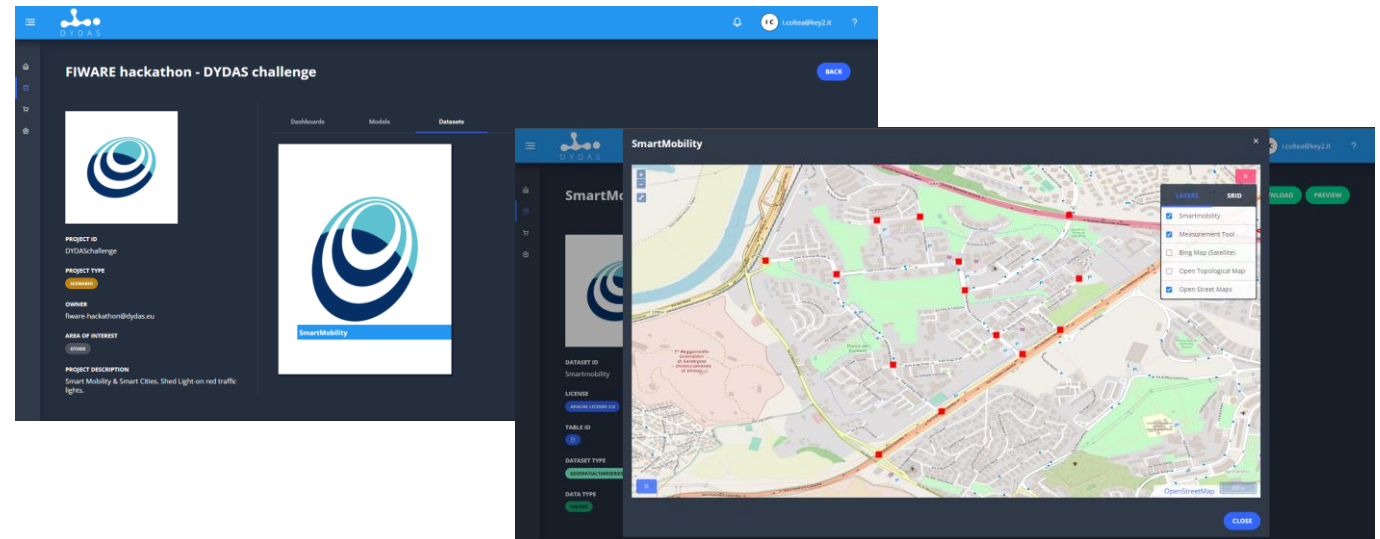
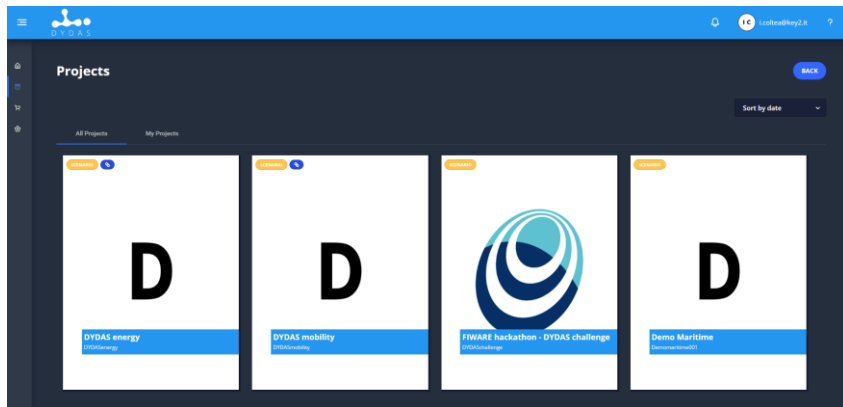
DYDAS Challenge – Step 4a

You can now access the project in “Projects” section

Click “View” (lens button) to access the project details. In the Datasets section you will find the simulated data

You can “Preview” data or download it if you are going to use the data for trainings outside of the platform

Data structure is described in the user guide.



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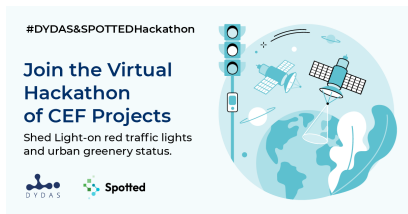


DYDAS Challenge – Step 4b

- Dataset is built up incrementally with data each 60 seconds.
- Each minute a snapshot of the past minute traffic flow and lights state is received.
- The input of the algorithm/model must be compliant with the simulated input. The algorithm/model will undergo performance and efficiency assessment during evaluation

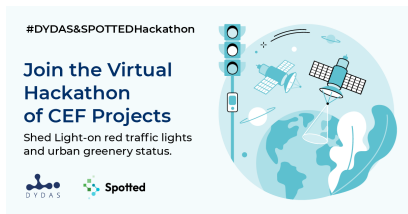
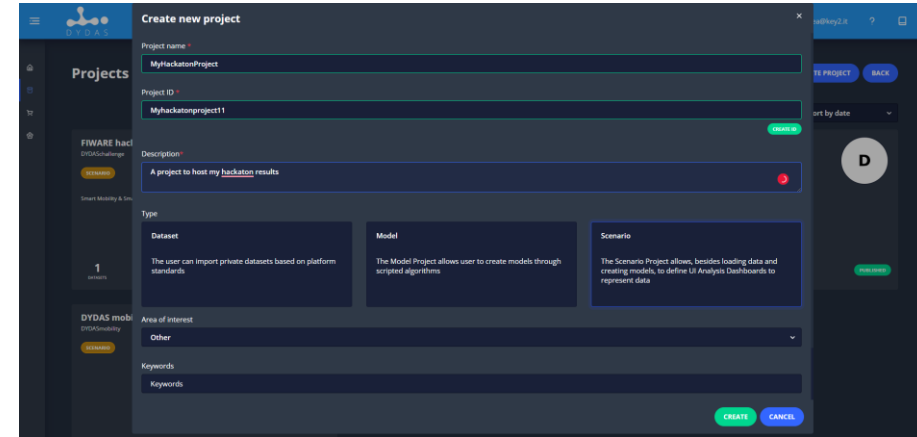
Same data is available through subscription to the **FIWARE Context Broker**.

See User Manual for details.



DYDAS Challenge – Step 5

- Create a new “**Project**” in DYDAS platform (Workspace section) and import the Dataset from step 4, and create any dataset you need, use the manual if you have difficulties or contact us if you need help. Project type should be “**Scenario**”
- If more than 1 person collaborates, add them as contributors (max 5)
- **Write** a python based algorithm using any IDE or using Model section of DYDAS platform. No need to use the platform for developing, but the resulting algorithm/model must be runnable in the model section. Check User Manual for compatible libraries and frameworks
- **Train** an AI model with the simulated data or other open data you may find or build. AI models are preferred but are not mandatory

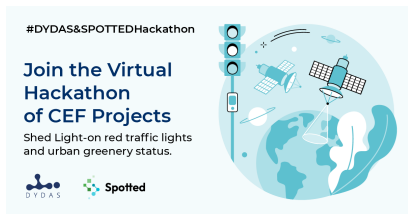


DYDAS Challenge – Step 6

DEVELOP!

- Mission is to provide a model or algorithm that for each snapshot gives the indications on which traffic lights should change status (red or green) based on traffic flow, road characteristics, and...**intuition**
- The **best performance** is considered to be when overall time of all cars in the graph is minimum.

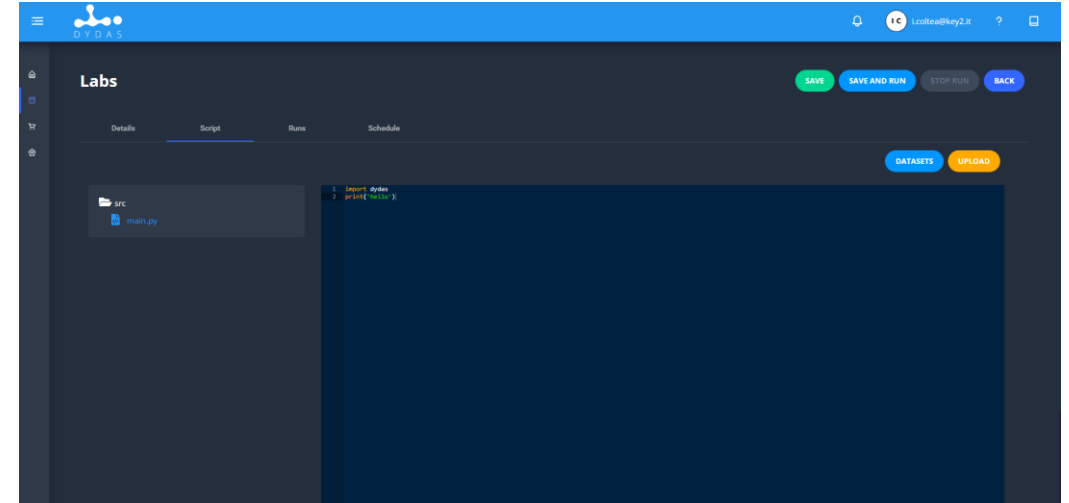
Output data **MUST** be compliant with data structure described in user manual



DYDAS Challenge – Step 7

- Run your resulting scripts of model in the project you created in DYDAS using “Model” section of the project (select Apache as Licence).
- “File Manager” section might get useful in this phase, especially for loading trained models and use them into the platform

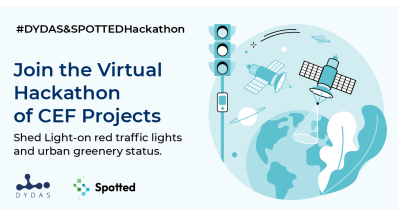
NOTE: The computational resources are limited on the platform. If you need more resources (must be justified) contact us. No penalty will be imposed if the execution is not under a minute but still must be efficient enough to be executed in acceptable time.



Use the manual for this section or check us out on Twitter or LinkedIn for training on this section. Live sessions with training are already scheduled, while registrations will be available the day after for each session.

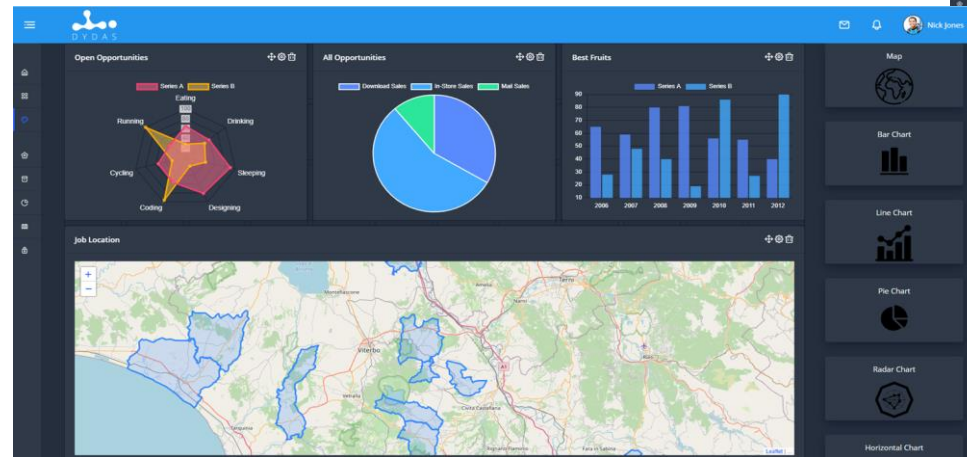
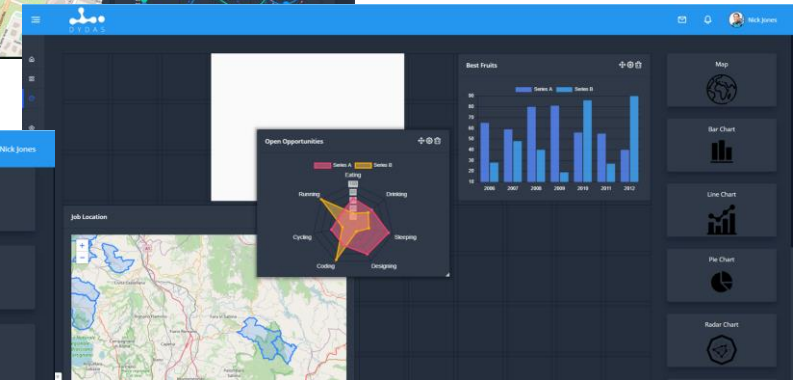
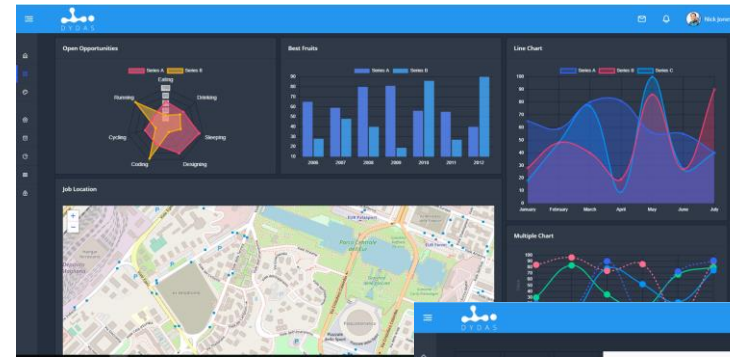
<https://twitter.com/DYDASEU>

<https://www.linkedin.com/company/dydas-eu/>



DYDAS Challenge – Step 8

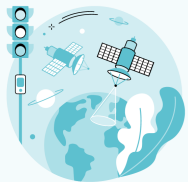
- Check if model is able to run with success with the simulated data and store the output in a new dataset created only for your project
- You can use “Dashboard” section to create data visualizations. Create any dataset you find useful to represent your results. This step is not mandatory, but it helps you explain your results



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DYDAS Challenge – Step 9

Submit your results!

- Use the form on FIWARE site to submit your proposal

<https://www.fiware.org/the-virtual-hackathon-of-cef-projects/#benefits>

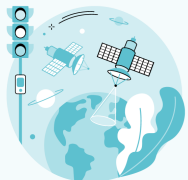
- Load your presentation and indicate at least the project ID you used on DYDAS platform that contains the developed scripts/model or load contents as zip file.



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DYDAS Challenge – Step 10

Present your results

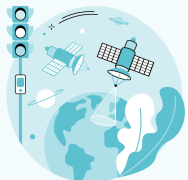
- Provide a presentation with you results, explaining your approach and the considerations that you have made during the development
- Ideas, intuition and innovation will be greatly appreciated...and get ready for the **pitch**



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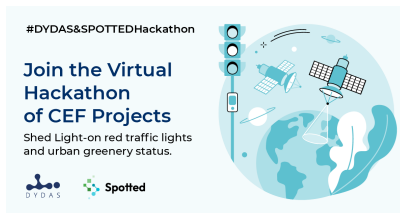
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DYDAS Challenge – Constraints summary

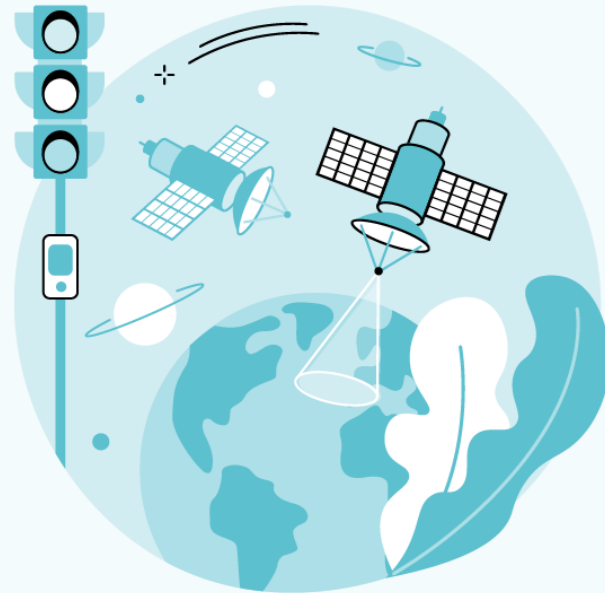
- Training can be performed using any tool and/or data
- Simulated data of a portion of the city of Rome streets will be provided through **FIWARE Context Broker** and **DYDAS** platform each 60 seconds as input graph
- Data structure of both input and output must be compliant with the simulated data provided
- Algorithms/Models must be released and executed on DYDAS platform (Python scripting/TensorFlow or Pytorch models or other python based libraries)
- Evaluation will include performance assessment (technical) and jury assessment (presentation) of results



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Any doubt? Contact us!

tonia.sapia@fiware.org
help@dydas.eu

GOOD LUCK!

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<https://www.linkedin.com/company/dydas-eu/>

Check our training sessions

<https://www.youtube.com/playlist?list=PLrIwu5Ftw0GQAEyyW0jsLIFyFd70N5bAx>

More webinars coming up, check our socials for updates