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GRAPEVINE project: hiGh peRformAnce comPuting sErvices for preVentIon and coNtrol of pEsts in fruit crops

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Mildew is a highly destructive disease of grapevines, it appears in all grape-growing areas of the world where there is spring and summer rainfall at temperatures above 10ºC and highly affects the production.

GRAPEVINE (hiGh peRformAnce comPuting sErvices for preVentIon and coNtrol of pEsts in fruit crops) project has the objective to improve the current processes to detect in advance the phenological grape state, the mildew and other grapevine diseases with the development of a predictive model based on Machine Learning (ML) and Deep Learning (DL) techniques. GRAPEVINE wants to improve, in the first place, the evaluation and control of mildew in wine cultivation to reduce the amount of fungicide, and the number of its treatments, to introduce sustainability criteria in agricultural production, offering higher quality agricultural products safer for consumers.

To feed these ML and DL models the use of weather forecast simulations is necessary. All these models must be deployed in a coordinated way in a daily operation to provide on time information to the farmers. The use of advanced computational and data processing services is critical for the success of the project.

We present the GRAPEVINE project, the models, the software to orchestrate all these services (including data management activities and monitoring) and how the use of Cloud compute services of the European Open Science Cloud in the EGI-ACE project have provided a platform for the development of this innovative service for the farmers. This paper shows how the proposed architecture had a positive impact on the usage of the computational resources and how users can benefit from advanced infrastructures with lower effort and required know-how

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