



HPC and Big Data Technologies for Global Challenges

Have you heard about the latest developments in the HiDALGO2 project? There has been significant progress through essential interdisciplinary research conducted by all the working teams. Read about the project's active engagement in relevant events and conferences, fostering synergies and collaborations with other European projects and initiatives. It's interesting to note that we are presenting the use case project called the Urban Air project, which focuses on the evolution of air in urban areas considering pollution, wind, comfort, and planning. There are also some interesting blog topics like the adoption of DevOps and CI/CD for seamless supercomputer deployments. It's fascinating to see how technology can make such a significant impact on global challenges.

Stay informed about all our activities by following us on our channels. Enjoy reading!

www.hidalgo2.eu



Message from the quality manager of HiDALGO2

Dennis Hoppe - technical manager at HiDALGO2 | High-Performance Computing Center Stuttgart



Dear HiDALGO2 community,

Welcome to the latest issue of our newsletter! We look back on the achievements of 2023 and look forward to the opportunities that await us in 2024 and beyond. I am pleased to share some exciting news with you from a technical management perspective.

The cornerstone of our technical and scientific management lies in the comprehensive **technical roadmap** that guides us through all four years of the HiDALGO2 project. This roadmap, which we closely aligned with our objectives and key performance indicators (KPIs) and that we compiled during the year 2023, also includes interim targets. Regular assessments, carried out every six months, allow us to adapt and update our targets to meet upcoming challenges and requirements.

Further, I am pleased to announce an important milestone in our journey: **HiDALGO2 pilots now have access to all available supercomputers of the EuroHPC JU**. This development has enabled us to start benchmarking activities using the ReFrame framework, which provides a standardised approach to benchmarking and results analysis on high-performance computing (HPC) systems.

Looking ahead to 2024 and beyond, we look forward to exploring the enhanced computing power of the new EuroHPC supercomputers. HiDALGO2 will also actively contribute to realising the EuroHPC JU's vision to implement a pilot ecosystem for continuous integration and continuous delivery (CI/CD) for all EuroHPC supercomputers. Our task is to test the CI/CD methodologies with our pilot codes. Here, our experience in 2023, especially in testing automated deployment on these systems with technologies such as GitLab Runner, is a good starting point to build upon in 2024.

I sincerely thank all [members](#) of the HiDALGO2 community for their dedicated efforts and contributions in 2023. Let's continue to innovate, collaborate and shape the future of HiDALGO2.

With warm regards,
Dennis Hoppe

USE CASES & TOOLS

The Urban Air Project



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Széchenyi István University (SZE), our partner from Hungary is developing one of the use cases of the HiDALGO2 project - the Urban Air Project use case, which focuses on the evolution of air in urban areas considering pollution, wind, comfort, and planning. Other contributors in this use case are the teams from Cemosis (Center for Modeling and Simulation in Strasbourg), High-Performance Computing Center Stuttgart (HLRS), and MeteoGrid.

NEWS

The ins and outs of the HiDALGO2 Project



Do you know what are the social and environmental challenges that HiDALGO2 aims to tackle and the use case scenarios it will work on, the innovations it proposes and the role of its partners in the interdisciplinary research using HPC, HPDA, and AI?

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In pursuit of a collaborative workshop alongside ESIWACE3 at the HiPEAC Conference

HiDALGO2 IN HIPEAC
WORKSHOP Towards Reliable Digital
Twin for Global Challenges

17 JAN 2024
14:00-17:30



The HiDALGO2 project is paving the way towards reliable digital twin advancements for global challenges. With active engagement from partners and a joint workshop scheduled at the HiPEAC Conference, the project is poised to make a significant impact on advancing applications and tools capabilities. It's inspiring to see such dedication and

collaboration towards shaping the future of HPC, HPDA, and AI. The workshop will take place in Munich, on January 17.

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Unlocking the sessions of the joint workshop on digital twins at the HiPEAC conference

WORKSHOP AGENDA 17 JAN 2024 14:00-17:30	
Towards Reliable Digital Twin for Global Challenges	
Presenter	Title
Zoltán Horváth (SZE)	Real-time digital twins for the high-resolution urban air quality and wind comfort
Łukasz Szustak, Marcin Lawenda (PSNC)	Profiling and optimization of Python-based scientific applications in new HPC Systems
Xavier Yepes-Arbós (BSC)	How to tackle the improvement of computational performance? Different possible ways explored in ESIWACE3
Coffee Break	
Bartosz Bosak, Michał Kulczewski, Wojciech Szeliga (PSNC)	Uncertainty quantification and sensitivity analysis for CoEs
Flavio Cesar Cunha Galeazzo (HLRS), László Környei (SZE)	Uncertainty Quantification in HiDALGO2: Enhancing Modelling Credibility for Environmental Pilots
Piotr Kąpta, Bartosz Bosak, Tomasz Piontek (PSNC)	Unleashing the potential of HPC with QCG-Portal: building customised platforms for specific scientific and industrial use-cases
Ákos Kovács, Máttyás Y. Constans (SZE)	Web-based portal and visualization for EuroHPC applications – introduction and tutorial



Seven distinct sessions were distributed in 4 different segments, covering application, performance, uncertainty quantification, and portal, in our joint workshop on digital twins during the HiPEAC Conference.

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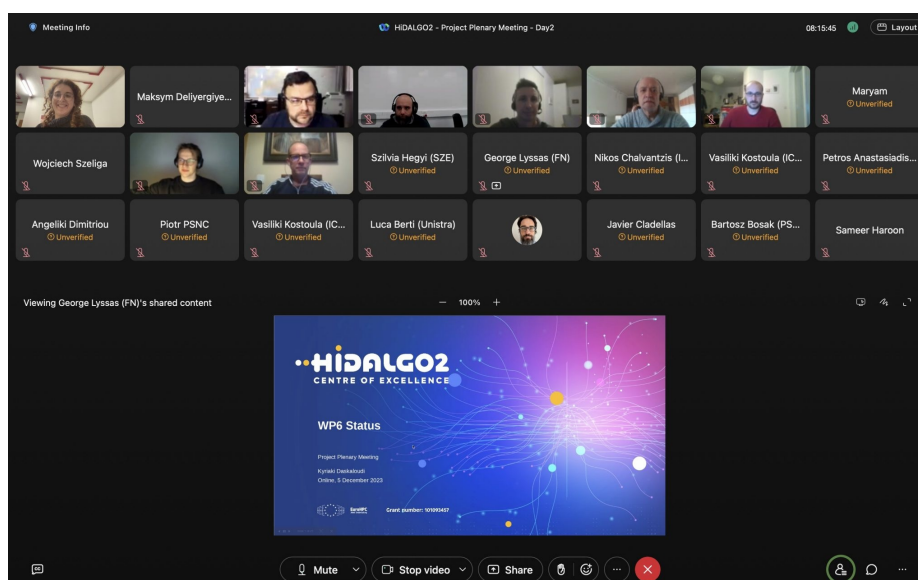
EURO HPC User Day, Brussels



HiDALGO2 was present at the EuroHPC User Day taking place in Brussels, on 11th December 2023 and organised by the EuroHPC Joint Undertaking. The event hosted more than 50 speakers from different fields that use supercomputer performance to improve the capacity of computing their models.

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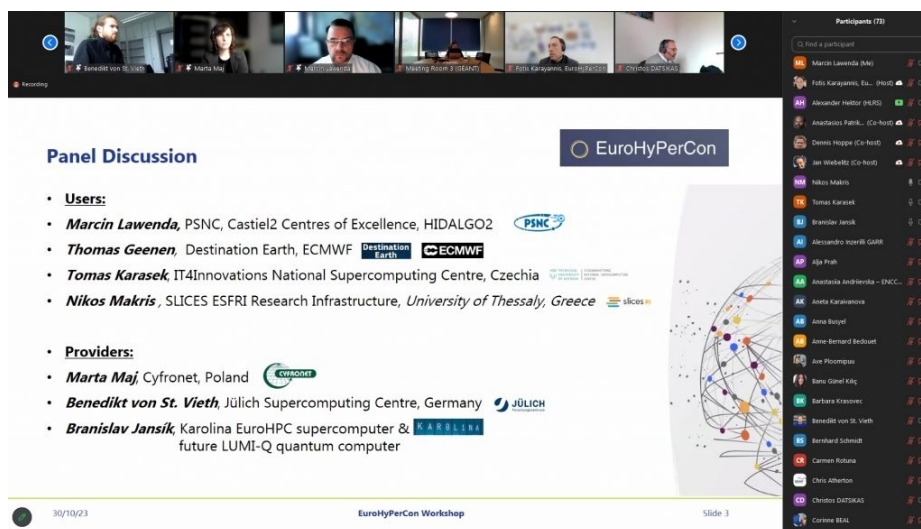
Transnational project meeting



Our plenary meeting was a great opportunity to discuss the progress of all the work actions of the HiDALGO2 Project and set the tone for the next crucial steps. Many thanks to all partners for their contribution!

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HPC connectivity needs: Current State and Future Vision



HiDALGO2 Project actively participated in a discussion on developing HPC connectivity solutions at the EuroHyPerCon event on 22nd November 2023. The title was “HPC Connectivity and our project coordinator Marcin Lawenda was one of the panelists.

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EuroHPC in Supercomputing Conference (SC23), Denver

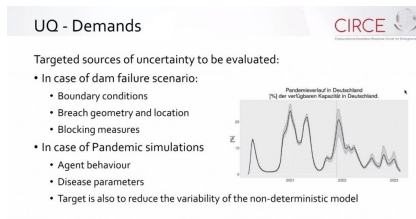


The EuroHPC Joint Undertaking presented various European projects – HiDALGO2 being among them. The team from our project coordinator, PSCN had the chance to present to the visitors at their booth the work done in HiDALGO2 and what we aim to achieve. Topics such as challenges of global warming as well as various weather forecast simulations, related data management and multiscale approaches were put on the table for discussion attracting much attention. SC23 was a great opportunity to popularise the HiDALGO2 project, especially to American visitors.

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JOINED ACTIONS

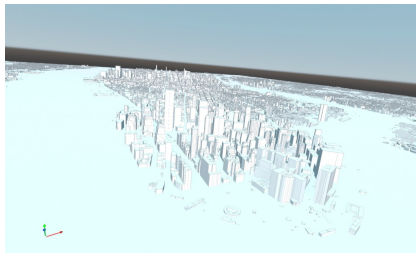
Workshop in Uncertainty Quantification by HiDALGO2, SEAVEA, and CIRCE



Find more about the joint workshop on Uncertainty Quantification by HiDALGO2, SEAVEA, and CIRCE, where we exchanged ideas and organised upcoming actions to take place in 2024.

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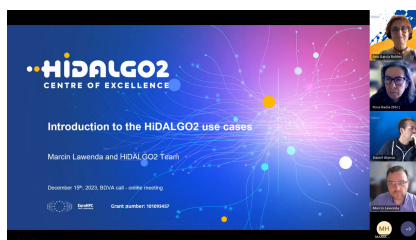
Challenges and bottlenecks of our Urban Building pilot at NumPEx workshop on Discretization @Exascale



On November 8, 2023, Vincent Chabannes and Christophe Prud'homme from Cemosis presented at the Exa-DI workshop on Efficient Discretization@Exascale, the HiDALGO2 Urban Building Pilot and in particular the challenges we face to reach exascale computing from the discretisation point of view.

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Exchanging powers with Big Data Value Association



We are glad to announce our new synergy with the Big Data Value Association, a member of the EuroHPC JU. In our first meeting on 15th December 2023, Marcin Lawenda presented HiDALGO2 and explored further joint activities related to the convergence between Big Data, HPC and AI.

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BLOG

HiDALGO2 Adopts DevOps and CI/CD for Seamless Supercomputer Deployments

If you are curious about what “DevOps” and “CI/CD for Seamless Supercomputer Deployments” are, read on and discover how these can help HiDALGO2 achieve its ultimate goal: overcoming environmental challenges such as increased flooding risks, wildfires, and air pollution.

[Read More](#)

Trying to decode wildfires’ behaviour

Following a serious fire season all over the world and in particular in Southern Europe, the experts of the HIDALGO2 project in MeteoGrid are working on a simulation to gain insights into the complex phenomena involved in such destructive episodes.

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What’s coming next in HiDALGO2?

The Hidalgo2 partners remain up to date with the latest developments in the sector & active in promoting the research and progress of the project by participating in important industry events. They will be happy to meet you in person and discuss more on creating a EuroHPC ecosystem in the following events:

International Conference on Supercomputing (ICS), 12-16 May, 2024, Hidalgo2 participates in a workshop organised under the common initiative of all JU CoEs.

EuroHPC Summit 2024, 18 to 21 March, 2024, Antwerp

International Conference on Advances in Forest Fire Management, in February 2024 in Jeddah

14th International Conference on Air Quality, 13-17 May 2024 in Helsinki

TERATEC International meeting for Simulation and High Performance Computing, May 2024 in France.

Moreover, important collaborations with other Centres of Excellence and National Competence Centres are underway with an exchange of tools, studies, dissemination material, and

PARTNERS



H L R I S

Atos



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EuroHPC
Joint Undertaking

Co-funded by the European Union. This work has received funding from the European High Performance Computing Joint Undertaking (JU) and Poland, Germany, Spain, Hungary, and France under grant agreement number: 101093457.

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