

Supercomputing for healthtech innovation: An interview with Diem Bui, Solution Engineer at LuxProvide¹

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Abstract. Luxembourg's supercomputer MeluXina is open to cooperation with companies that need to process huge quantities of data. Diem Bui, Solution Engineer at LuxProvide that manages MeluXina, explains how healthtech companies can benefit from supercomputing to develop and implement innovative health technology applications.

Keywords: Supercomputing, companies, dataprotection, healthtech, Luxembourg

Ms Bui (Fig. 1), why is supercomputing relevant for innovative healthtech companies?

The COVID-19 pandemic has had huge repercussions on our healthcare system. It has accelerated the need to complement traditional methods with digital applications that can speed up diagnostics, drug development and treatment.

Data-based solutions powered by artificial intelligence (AI) can help healthcare professionals detect anomalies in patient data, diagnose cancer and discover new drugs more speedily with higher accuracy, fewer errors and lower cost. In pharmaceutical research, the use of applications performing real-time data analyses and of AI modelling can facilitate molecular and drug simulations, protein structure sequencing, etc. However, the challenge is to be able to process these large quantities of data and run compute-intensive AI workloads in a secure and trusted environment. The solution is supercomputing.

How can supercomputers help healthtech innovation?

A supercomputer incorporates several thousands of processors capable of doing a staggering number of calculations per second. Some supercomputers can accomplish up to one hundred quadrillion of floating-point operations per second (FLOPS). MeluXina can perform calculations 17,000 times faster than an ordinary computer. This opens a world of opportunities for processing complex healthcare data and images.

What added value does MeluXina offer to companies in Luxembourg?

Small and medium-sized AI-based companies that work with us do not only have access to MeluXina's computing power. Our AI and data science expertise also enables them to focus on their core activities

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Fig. 1. Diem Bui, Solution Engineer at LuxProvide.

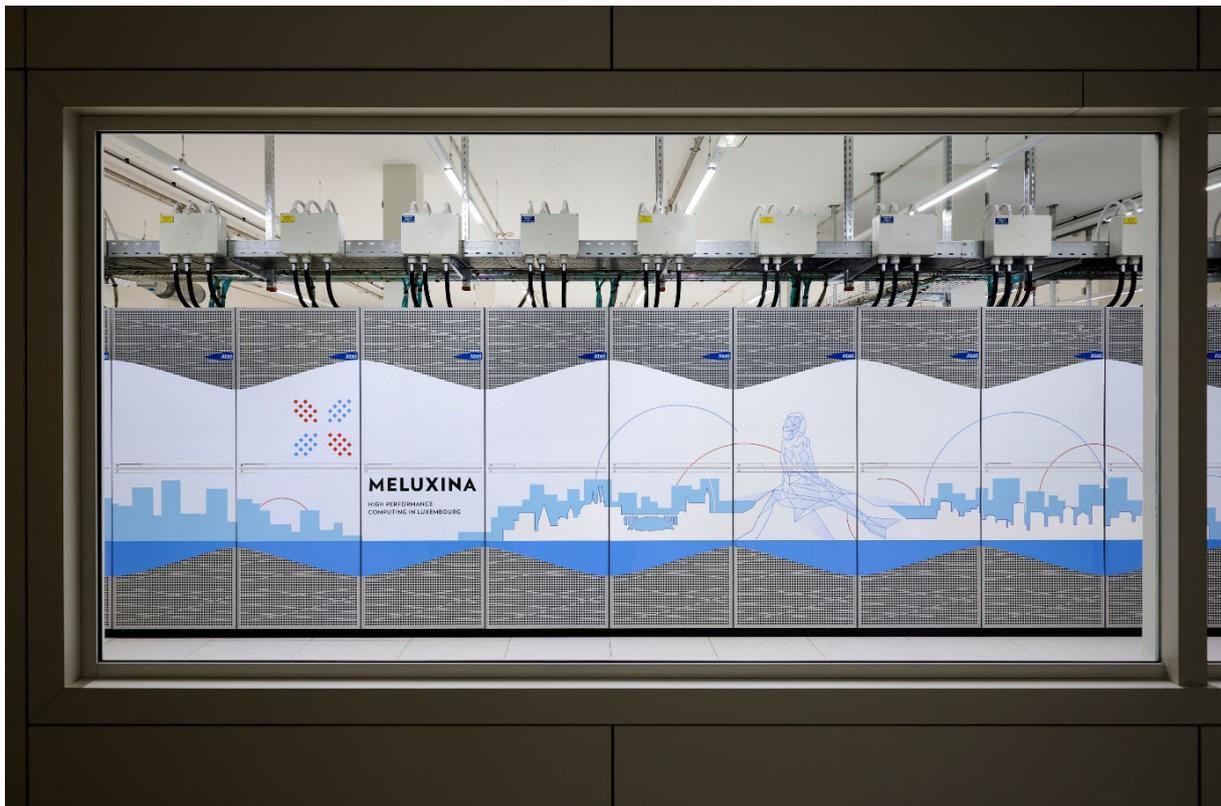


Fig. 2. Luxembourg's national supercomputer Meluxina.

without having to invest time and resources into building supercomputing capabilities. We offer a cost-effective environment that shortens the time to market for healthtech innovations, and where sensitive health data can be stored in full confidence.

LuxProvide's mission [1] is to build a better future by enabling more sustainable, more precise and less resource-consuming solutions. We want to build partnerships with companies that contribute to the digital transformation and cutting-edge innovation capacity of our society in the years to come.

Luxembourg's national supercomputer Meluxina (Fig. 2) has been built to serve a large variety of complex, data-driven computational workloads. Its design is forward-looking, responding to the convergence of simulation, modeling, data analytics and artificial intelligence, and enabling simulation-driven by predictive analytics. As the most powerful of the Petascale systems in the EuroHPC network and one of the fastest supercomputers in Europe, it provides a robust platform for science and industry. With 18 PFlops of computing, 21 PB of storage, and HDR 200G interconnect resources, in June 2021, MeluXina has been ranked 37th in Top500 and it is the greenest supercomputer in the EU and 4th greenest in the world.

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Conflict of interest

None to report.

References

- [1] LuxProvide website: <https://luxprovide.lu/>.
- [2] Luxembourg Competence Centre in High-Performance Computing: <https://eurocc.lu/>.
- [3] EuroCC project – European network of national competence centres: <https://www.eurocc-access.eu/>.