Home > Notizie >

Better diagnosis and treatment of cardiovascular and ophthalmologic diseases results from European project "EXTRA".

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Nine European universities and companies worked on the European project "EXTRA" between September 2015 and August 2018. It was coordinated by Prof. Dirk Stroobandt from Ghent University, Belgium. The project results in methods and software tools to develop future exascale High Performance Computing (HPC) applications. The main framework that results from EXTRA is CAOS, a tool that delivers "CAD (Computer-Aided Design) as an Adaptive Open platform Service".



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much faster and much more efficiently than the current manual optimization process. The results were used for three different applications: a novel image segmentation application targeting the medical sector, an application that allows financial institutions to model risk in their portfolios more accurately, and a computational chemistry application. In all three applications, we could easily accelerate the application several times (up to 100 times) while being much more energy efficient. Thanks to the software platform, these optimizations could be reached in significantly less time than in manual implementation optimizations.

Project coordinator Dirk Stroobandt (Ghent University): "Future HPC applications such as weather forecasting, human genome unravelling, medical diagnosis and treatment applications, will require ultra-performant computing, called exascale computing. To handle these stringent performance requirements, HPC systems need ultra-efficient heterogeneous compute nodes. To reduce power and increase performance, such compute nodes will require automatic adaptation (called reconfiguration) as an intrinsic feature, so that specific HPC application features can be optimally accelerated at all times, even if they regularly change over time. Therefore, the use of reconfigurable components, such as FPGAs (Field Programmable Gate Arrays) has to be included in the tool flow.

The resulting framework is available for the research community to accelerate future exascale applications. Within the project, we have tested the framework on the three mentioned applications and we showed that the framework has huge benefits for designers to implement accelerated applications much faster than the current manual optimizations, while keeping a good quality of the optimisations. Similar benefits will be seen by researchers using our platform for other HPC applications so the EXTRA project is expected to have a multiplicative effect in future applications.

H2020 project EXTRA: Exploiting eXascale Technology with Reconfigurable Architectures Website: https://www.extrahpc.eu/

Parole chiave

HPC, high performance computing, CAD, reconfigurable architectures

Contributore

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Progetti correlati



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