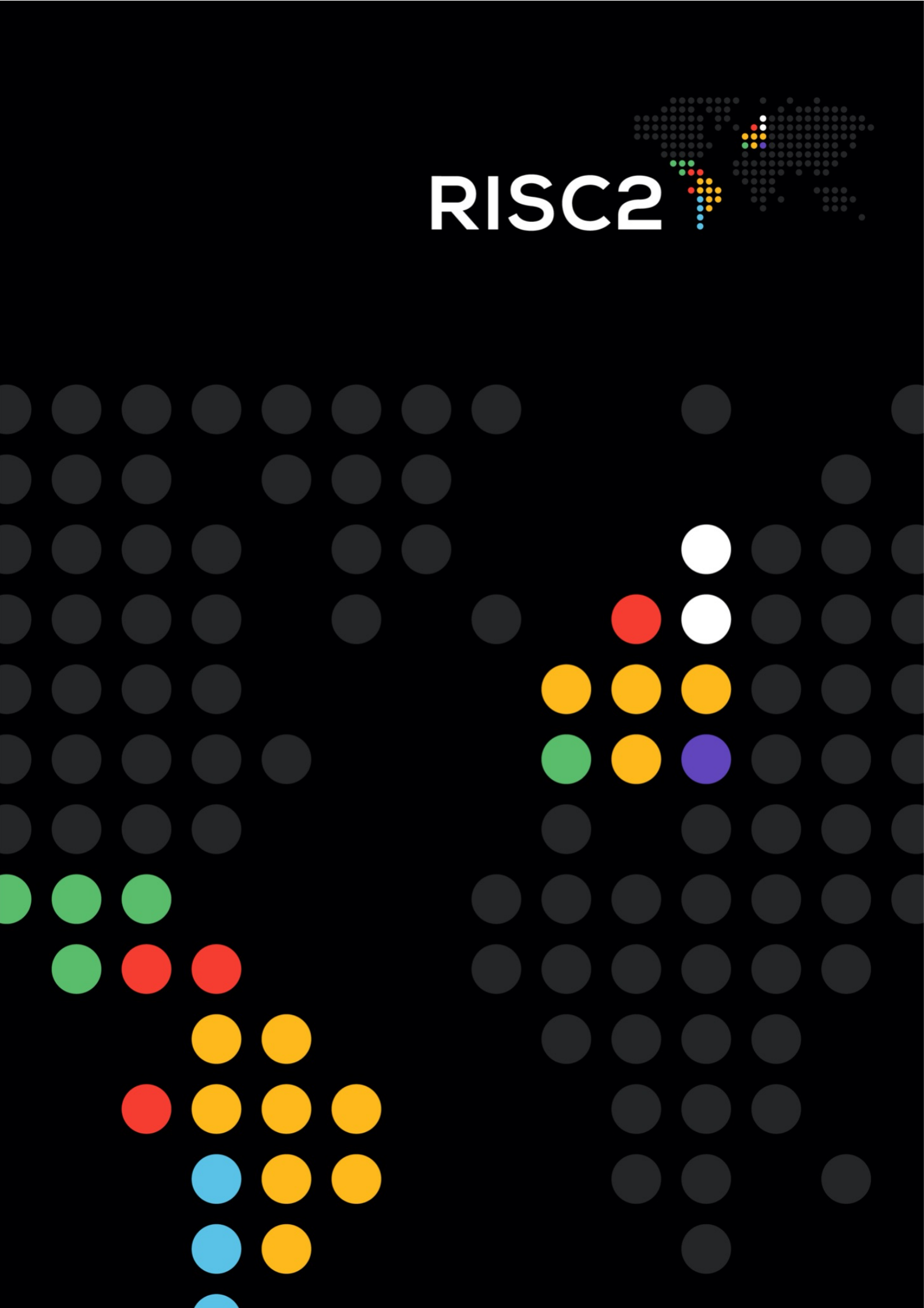
RISC2

EU and Latin America push for industry innovation using supercomputers

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The fight against COVID is considered one of the fastest responses of the scientific community to a global-scale problem. There was no other time in history when the world could understand a problem and find a solution for it so quickly. Vaccines usually take 10 to 15 years to become available in the market, but the COVID-19 vaccine was ready to be administered in less than one year. These record-time results were achieved due to the collaborative trend that led researchers worldwide to share data and resources.

"High-Performance Computing" (HPC) allows data processing at incredibly high speeds using supercomputers. HPC was used to run digital simulations to understand the life cycle of SARS-CoV-2 and to find molecules that could prevent the virus from infecting people.

The 2020 pandemic is an excellent example of how HPC supported scientific research, but its computing power can go beyond boosting scientific research. HPC is expected to increase considerably in the coming years, with digitised business models and innovation propelling Europe's industry to leap into the next generation of technological advancement.

HPC can play an essential role to our society, which is why the EU aims to develop its HPC capabilities by exchanging knowledge with other parts of the world.

The RISC2 project is a European-led initiative that aims to build a network, gathering key European HPC stakeholders from research and industrial communities, to support the coordination of High-Performance Computing research between Europe and Latin America.

RISC2 consortium is led by the Barcelona Supercomputing Center and brings together 16 partners from 12 countries. The project aims to explore HPC's actual and potential impact in terms of coping with the growing environmental and scientific challenges - by promoting cooperation between HPC research and industrial communities in Latin America and Europe.

“In Latin American countries, industrial users are not well represented among the leading HPC players. HPC plays a pivotal role in stimulating economic growth and innovation, so it is essential to push HPC adoption by industries to enhance their innovation capabilities and sustain competitiveness. RISC2 aims to explore the real and potential impact on HPC in coping with the growing environmental and scientific challenges specifically in the economies of Latin America and Europe”, explained António Luís Sousa, a researcher at the Institute for Systems and Computer Engineering, Technology and Science (INESC TEC), Portugal, one of the RISC2 partners, and teacher at the School of Engineering of the University of Minho, Portugal.

Supporting research with HPC

HPC has been usually promoted for its applications in military defence, which allow the processing of satellite images, or the quick mapping of large areas, for instance. Because of its ability to crunch large amounts of data, HPC is relevant to research concerning COVID-19 and other fields, such as computational fluid dynamics that study the aerodynamics of vehicles,

for example, or even numerical weather and climate prediction and the evolution of the universe. However, HPC is also pioneering outside research.

Combining the power of HPC with Artificial Intelligence and the use of Big Data can provide unprecedented opportunities for transforming businesses, public and health services and societies. Many industries can use HPC to render special effects in films, predict the best locations to drill a new oil or gas well, detect credit card fraud, teach self-driving vehicles, improve cancer screening techniques, and track real-time stock trends. The potential is enormous, but old challenges remain, and others promptly rise. Substantial results depend on increased synergies, cooperation, and internationalisation in HPC-based research.

"The project brings together the main European and Latin American stakeholders in HPC, promoting the interaction between researchers and policy-makers from both regions. By strengthening the scientific cooperation towards innovation in Europe and Latin America, we will benefit from the exchange of best practices in HPC", said António Luís Sousa.

Benchmark source of information

RISC2 is also promoting the exchange of best practices through meetings, workshops and training. As part of this goal, the RISC2 project is organising a webinar series about "HPC System & Tools", with sessions to present state-of-the-art methods and tools for setting up and maintaining HPC hardware and software infrastructures. The webinars will be held until the end of the first semester of 2023. The first webinar, "Getting Scientific Software Installed: From EasyBuild to EESSI", will be held on August 24, 2022, featuring Kenneth Hoste (Ghent University) as a speaker and Bernd Mohr (Jülich Supercomputer Centre) as the moderator – two international HPC experts.

Alongside the exchange of best practices, RISC2 aims to provide a benchmark source of information that European and Latin American research organisations can resort to when looking for HPC-related information: the HPC Observatory. The HPC Observatory is available as a dedicated section on the project's website, and the goal is to analyse HPC's social and research implications. It aims to serve as a relevant source of information that European and Latin American research organisations can address HPC and AI issues.

One of the other primary outcomes of the project is a cooperation roadmap aimed at policy-makers, the scientific community and industry, identifying key application areas, HPC infrastructure and policy requirements, and exploring ways for the activities established during the project to last beyond its lifetime.