

CONVECS

“Venetian Community for Scientific Computation”

Andrea Zanella

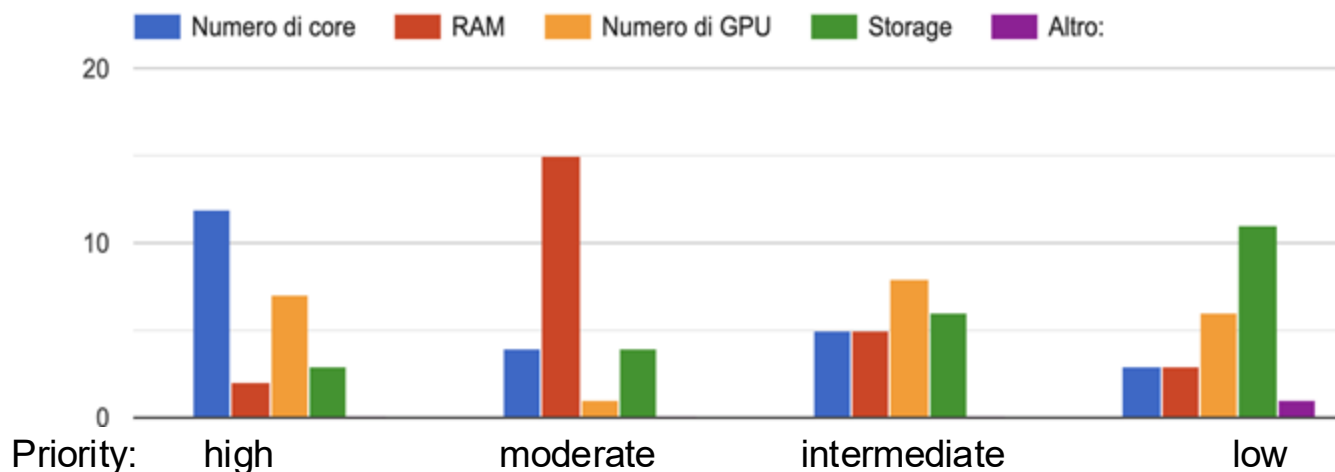
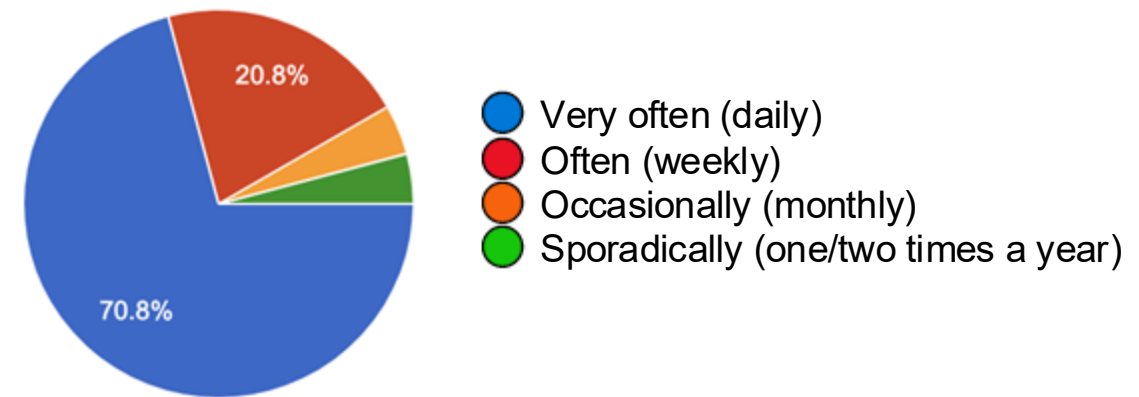
Vice-Rector for Information and Communication Technologies - ICT



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Motivations

In recent years, high-performance computing (HPC) has become an **increasingly pressing need** in various disciplinary scientific fields

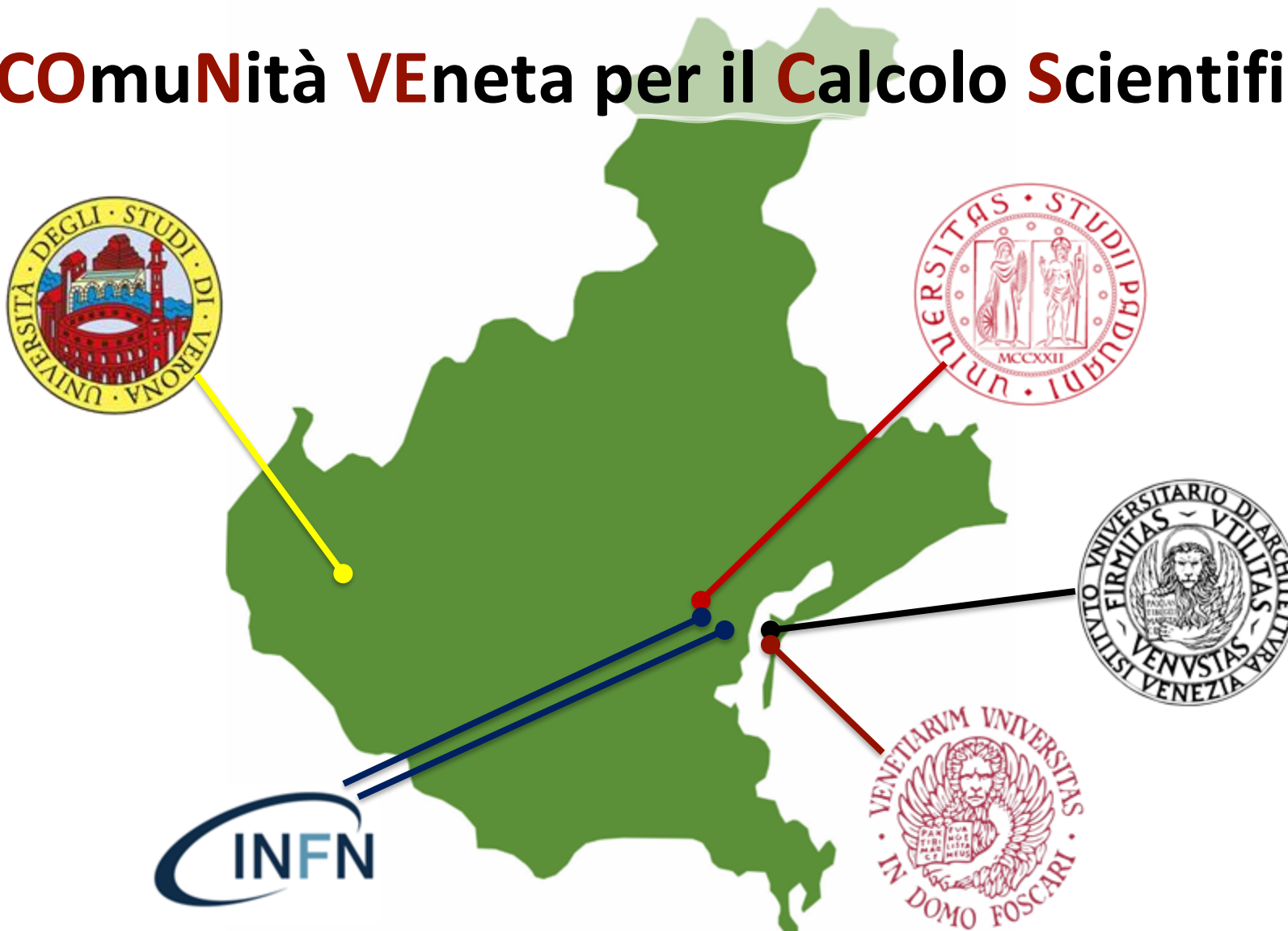


CONVECS addresses this need by funding the **upgrading & federation of HPC** infrastructures at **regional level**

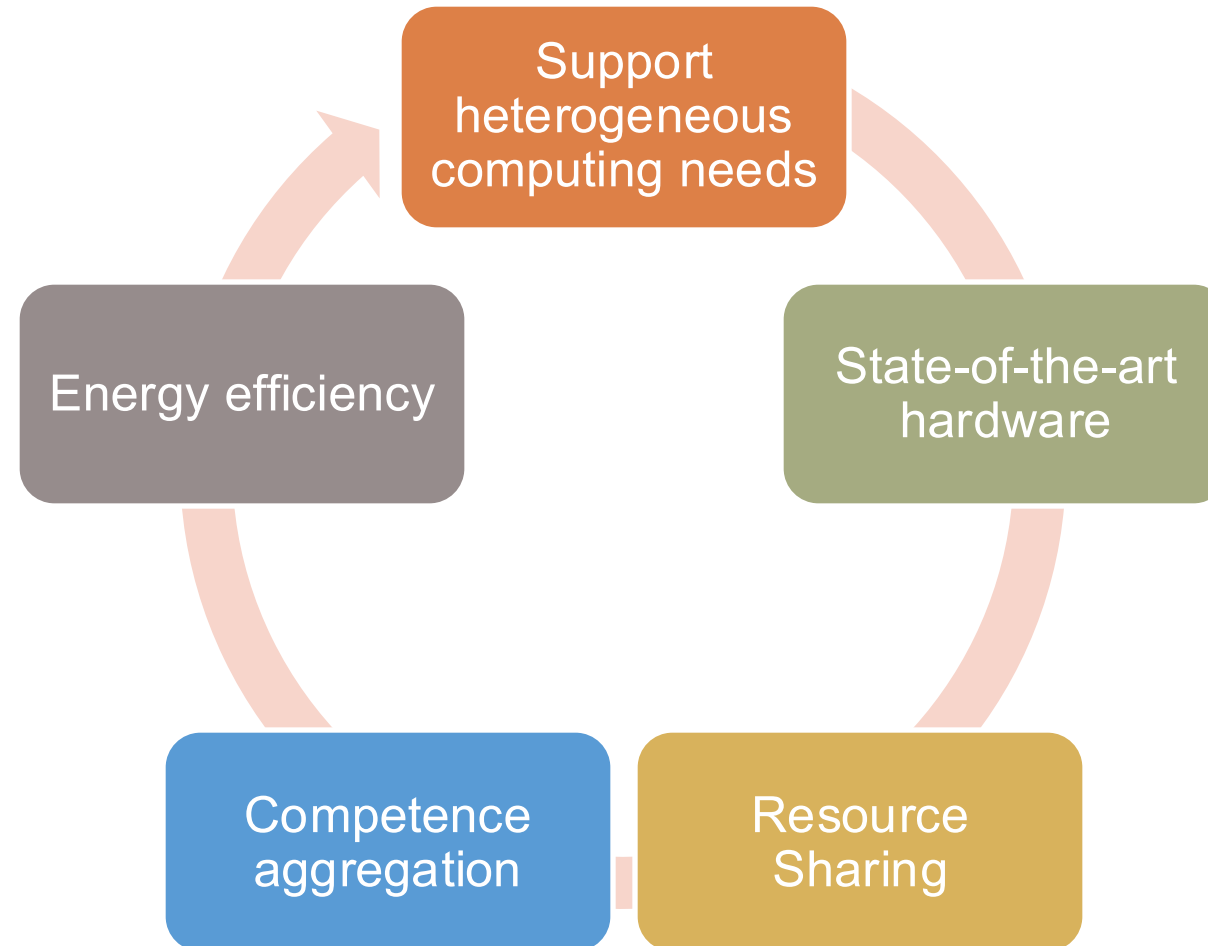


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CONVECS: COmuNità VEnetata per il Calcolo Scientifico



Technical objectives



Strategic objectives





The infrastructure

Currently available @ UNIPD

GPU

- 20 GPU H100 (5xDGX)
- 1 GPU+CPU GraceHopper
- 40 GPU L40S
- 40 GPU A40

CPU

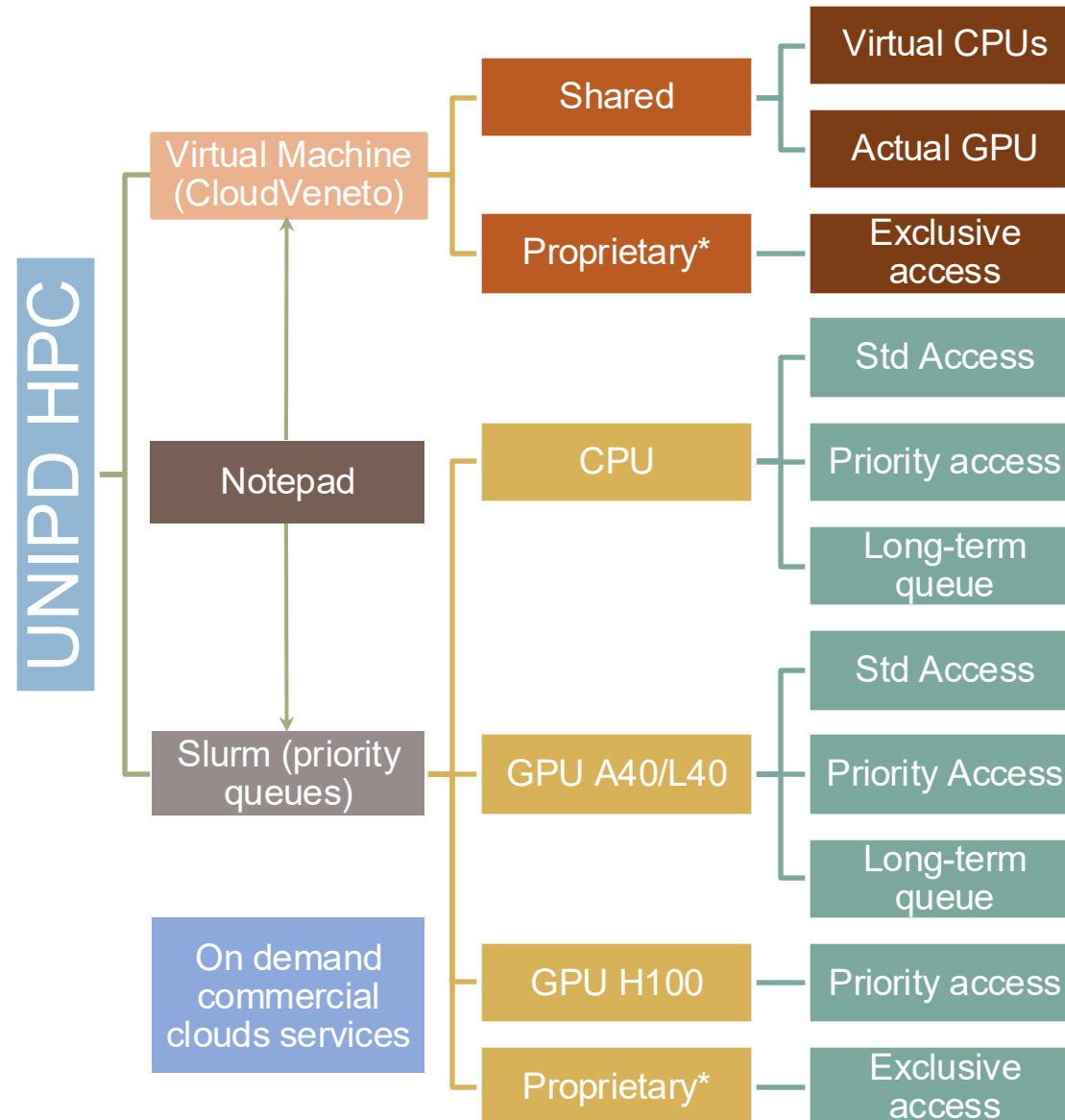
- 800+ CPU core SLURM
- 1200+ core Cloud

Storage

- 700 TB SD
- 1000 TB HD

Tot IT power: ~150 kW

Target: x 3



Environmental benefits



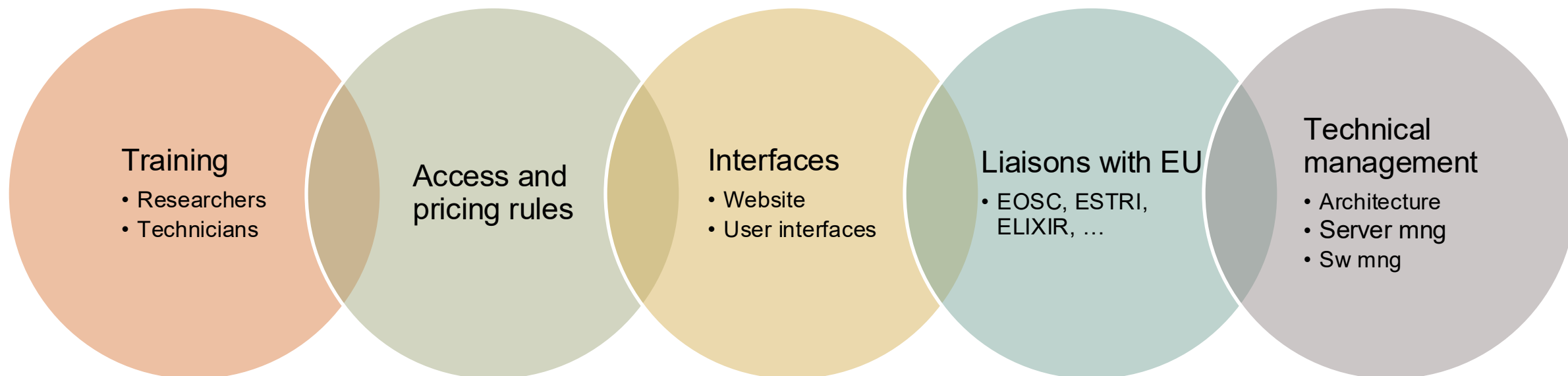
CONVECS promotes the collective use of computing resources, reducing the wasted energy associated with the irregular use of resources through:

- the effective monitoring of hardware resource usage
- the implementation of policies for automatically turning servers on and off based on usage demand

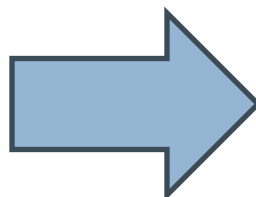


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Growing the HPC Community



165+ researchers involved up to now



Target: 500+ researchers by 2027!



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Examples of application fields

Smart Health

The goal is to develop innovative technologies and solutions for human health.

Some of the applications are:

- Automated diagnostic image analysis
- Drug design and development
- Screening and early warning of disease events
- Human body digital twins



Veterinary medicine



CONVECS helps support veterinary research by enabling:

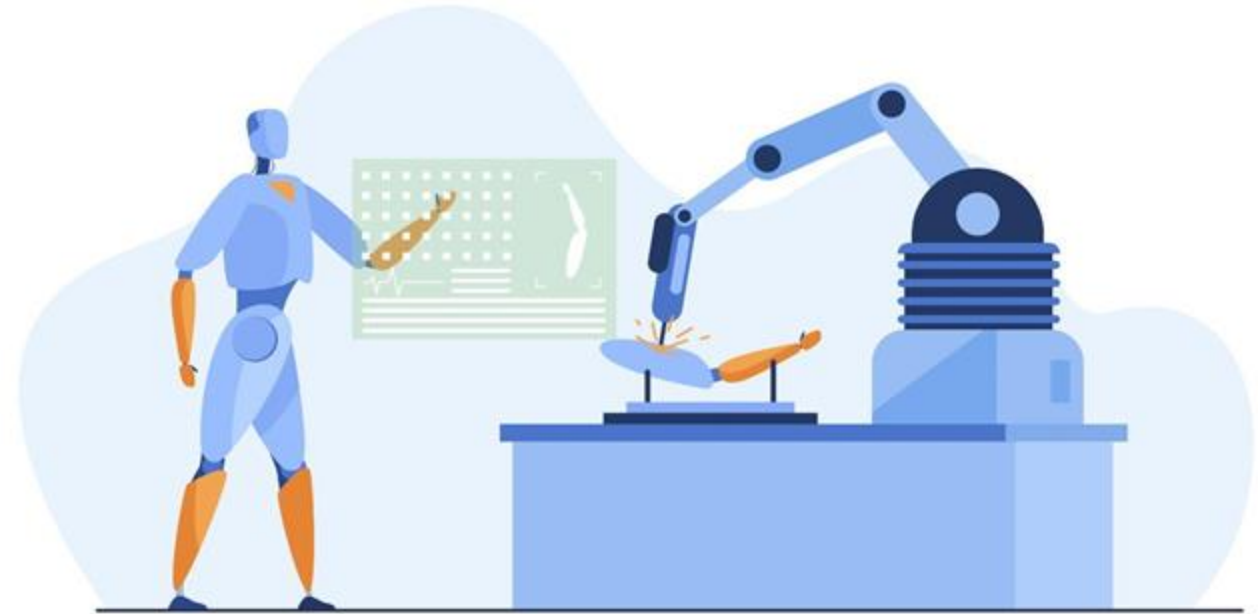
- The development of predictive models
- The analysis of large datasets to improve animal health and wellness

Smart Manufacturing

Automation, Robotics and Digitization

In this area, HPC represents a tool for innovation because it enables:

- The execution of simulations and modeling of production processes
- Real-time process monitoring and optimization via digital twins



Smart Agrifood

Agri-Food and Biotechnology

In this field, CONVECS aims to:

- The creation of predictive models of agronomic and production conditions
- Satellite image analysis for crop surveillance and optimization of agricultural practices



Smart Living & Energy

Sustainable management and environmental protection

The development of the advanced HPC infrastructure will enable:

- Optimize design and operation of renewable energy production facilities
- Monitor and understand environmental processes, contributing to sustainable management





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The idea taking form...

