DECICE

Device-Edge-Cloud Intelligent Collaboration framEwork

DECICE aims to develop an AI-based, open and portable cloud management framework for automatic and adaptive optimization and deployment of applications in a federated infrastructure, including computing from the very large (e.g., HPC systems) to the very small (e.g., IoT sensors connected on the edge).

EDGE | CLOUD | HPC | IoT | HETEROGENOUS SYSTEMS | AI-SCHEDULING | MACHINE LEARNING | DATA CENTERS | SYSTEM MONITORING | DIGITAL TWIN | KUBERNETES

BACKGROUND
Growth and higher complexity of cloud computing industry

CHALLENGE
Ultra-low latency, security and close location (e.g. in Smart Cities)

SOLUTION
AI-Scheduler: using the available resources of a digital twin

WE CAUGHT YOUR INTEREST?

Find out more about DECICE:

Working at vastly different scales requires an intelligent management plane with advanced capabilities that allow it to proactively adjust workloads within the system based on their needs, such as latency, compute power and power consumption. Therefore, we envision an AI-model, which can use a digital twin of the resources available, to make real-time scheduling decisions based on telemetry data from the resources.

The DECICE framework will be able to dynamically balance different workloads, optimize the throughput and latency of the system resources (compute, storage, and network) regarding performance and energy efficiency and quickly adapt to changing conditions.

The framework also gives the necessary tools and interfaces for the administrators and deployment experts to interface with all the infrastructure components and control them to achieve the desired result. The integration of the DECICE framework with orchestration systems will be done through open standard APIs to make it portable, modular and extensible.
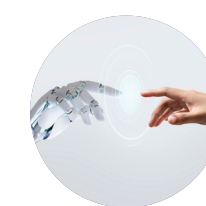
CONTACT & FACTS

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Discover our latest updates and news about the DECICE project.

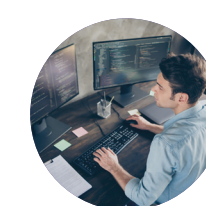## PROJECT CONCEPT

WHAT we are doing!

Solving the challenge of optimization of both performance and energy or addresses data and job locality.

AI-based, open and portable cloud management (from large HPC to small IoT)

Digital Twin
AI-model uses available resources for real-time scheduling decisions

DECICE framework
tool and interface for the administrators and deployment experts

Open standard APIs
portable, modular and extensible

DECICE OBJECTIVES

DEVELOP
a solution that allows to leverage a compute continuum ranging from cloud and HPC to edge and IoT.

CREATE
a scheduler supporting dynamic load balancing for energy-efficient compute orchestration, improved use of green energy, and automated deployment.

DESIGN
and implement an API that increases control over network, computing and data resources.
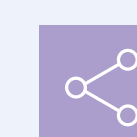
CONCEPTUALIZE
and implement a Dynamic Digital Twin of the system with AI-based prediction capabilities as integral part of the solution.

DEMONSTRATE
the usability and benefits of the DECICE solution for real-life use cases.

SOLUTION DESIGN
that enables service deployment with a high level of trustworthiness and compliance with relevant security frameworks.