A Model-driven development framework for highly Parallel and EneRgy-Efficient computation supporting multi-criteria optimisation

The Vision

The AMPERE project is working towards developing a new generation of software programming environments for low-energy and highly parallel and heterogeneous computing architectures, capable of implementing correct-by-construction advanced Cyber Physical Systems (CPS).

The key innovation of the AMPERE software architecture will be its capability of transforming the system model description of the CPS based on specific model-driven languages to the parallel programming models supported by the underlying parallel architecture, and so providing the level of performance required to implement the most advanced functionalities. Moreover, the AMPERE software architecture will fulfill the non-functional requirements (i.e., real-time, safety, energy-efficiency, security, reliability) imposed due to the cyber-physical interactions and captured in the CPS system description.

Focuses on the development of **complex Cyber-Physical Systems** (CPS) in industrial sectors with high **performance computing requirements** to cope with the most advanced functionalities in the **automotive and railway domains.**

Objectives

Fully exploiting the benefits of performance demanding emerging technologies such as artificial intelligence or big data analytics.

Provide a system design ecosystem optimised for Cyber-Physical Systems.

Provide a computer software ecosystem capable of efficiently exploiting advanced energy-efficient and parallel heterogeneous platforms.

Integrate AMPERE software solutions into two relevant industrial markets, i.e., automotive and railway

Project Description

PROJECT NAME
A Model-driven development framework for highly Parallel and EneRgy-Efficient computation supporting multi-criteria optimisation

ACRONYM
AMPERE

FUNDING SCHEME
ICT-01-2019 - RIA
(Research and Innovation Action)

GRANT AGREEMENT ID
871669

PROJECT COORDINATOR
Barcelona Supercomputing Center (BSC)

START DATE / END DATE
1 January 2020 / 31 December 2022

NUMBER OF PARTNERS
9

OVERALL BUDGET
€4.9 million

EU CONTRIBUTION
€4.9 million

PARTNERS

Barcelona Supercomputing Center – Centro Nacional de Supercomputación
isep – Instituto Superior de Engenharia do Porto
ETH zürich
Sant'Anna – School of Advanced Studies – Pisa
EVIDENCE – Embedding Technology
BOSCH – Invented for life
THALES – Building a future we can all trust
SYSGO – Embedding Innovations

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