# CLASS: Edge and CLoud Computation: A Highly Distributed Software Architecture for Big Data AnalyticS

## Description

Big data applications processing extreme amounts of complex data are nowadays being integrated with even morechallenging requirements such as the need of continuously processing vast amount of information in real-time.Current data analytics systems are usually designed following two conflicting priorities to provide:

(i) a quick and reactiveresponse (referred to as data-in-motion analysis), possibly in real-time based on continuous data flows; or

(ii) a thorough and more computationally intensive feedback (referred to as data-at-rest analysis), which typically implies aggregating moreinformation into larger models.

Given the apparently incompatible requirements, these approaches have been tackledseparately although they provide complementary capabilities. CLASS aims to develop a novel software architecture to help big data developers to combine data-in-motion and data-at-restanalysis by efficiently distributing data and process mining along the compute continuum (from edge to cloud) in a completeand transparent way, while providing sound real-time guarantees. CLASS aims at adopting

(1) innovative distributedarchitectures from the high-performance domain;

(2) timing analysis methods and energy-efficient parallel architectures fromthe embedded domain; and

(3) data analytics platforms and programming models from the big-data domain.

The capabilities of the CLASS framework will be demonstrated on a real smart-city use case, featuring a heavy sensorinfrastructure to collect real-time data across a wide urban area, and prototype cars equipped with heterogeneous sensors/actuators, V2I connectivity, and cluster support to present the innovative capabilities to drivers. Representative applicationsfor traffic management and advanced driving assistance domains have been selected to efficiently process very largeheterogeneous data streams in real-time, providing innovative services while preparing the technological background for theadvent of autonomous vehicles.

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